National Drug Research Institute Health Sciences, Curtin University of Technology

Behavioural Intention to Provide Screening and Brief Intervention for Alcohol-Related Injury in the Emergency Department:

A Guiding Framework Using The Theory of Planned Behaviour

Rashid W. Flewellen

This thesis is presented for the
Degree of Doctor of Philosophy of Curtin University

December 2016

Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

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Human Ethics (For projects involving human participants/tissue, etc) The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007) – updated March 2014. The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number #....HR 172/2013

or

Animal Ethics (For projects involving animal use) The research presented and reported in this thesis was conducted in compliance with the National Health and Medical Research Council Australian code for the care and use of animals for scientific purposes 8th edition (2013). The proposed research study received animal ethics approval from the Curtin University Animal Ethics Committee, Approval Number #.....

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Behavioural Intention to Provide Screening and Brief Intervention for Alcohol-Related Injury in the Emergency Department

A Guiding Framework
Using the Theory of Planned Behaviour

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Abstract

Aims and Objectives: Alcohol-related injury is a significant public health challenge particularly in Emergency Departments (ED). Staff responses are invariably influenced by a number of factors, that including perceptions of people affected by alcohol, confidence in their ability to respond, and demands on limited resources. Therefore, it is vital to understand how clinician beliefs might influence effective care.

This thesis aimed to identify attitudes and beliefs associated with responses to alcohol related injury (ARI). A theoretical 'a priori' approach based upon the Theory of Planned Behaviour (TPB), was used to examine how self-reported attitudes and beliefs affected responses towards ARI. A mixed-methods design, using focus groups and a national online survey of ED clinicians, explored specific aspects of the responses. The general hypothesis posited that the theoretical framework could adequately explain the relationships and observed variance in behavioural intention of ED clinicians responding to ARIs. It was also hypothesised that attitudes towards people who sustain an ARI would influence clinician intention to intervene.

Methods: A diverse group of doctors, nurses and ED allied health staff from all Australian States and Territories participated through focus groups and 544 surveys. The theoretical model was tested using Multiple Regression Analyses and Structural Equation Modelling.

Results: The majority of staff worked in a metropolitan/major referral (49.4%) or urban district (25.8%) facility and had recently treated an ARI (80%). Respondents' beliefs were mixed as to whether the ED was practical setting to address harmful alcohol consumption, but many agreed ARIs were time-consuming. Most did not report receiving formal alcohol screening (67.8%) and brief intervention (69.2%) training, and several distinctions in exposure to such training existed among ED professional groups. For example, 16% of nurses, 29% of doctors, and 21% of allied health reported formal screening training, with similar rates for brief intervention training. Hierarchical multiple regression was used as a first step to determine the composite variables that best explain variance in behavioural intention, after controlling for demographic factors. A final model generated greater parsimony with two significant composite variables and an interaction term accounting for 43.2% of the variance ($F(12, 522) = 32.12$, $p<.001$). Using structural equation modelling (SEM), the total predictive value of a new model in explaining variance in behavioural intention was increased to 65.5% (RMSEA= 0.047; CFI= 0.919).

Conclusions: Previous research suggested preventive/early interventions for ARI were considered outside the scope of practice despite the fact that hazardous and harmful drinking have been implicated in many ED presenting problems. This study contributed to explaining this reluctance in adoption, which was due in part to a lack of clinician training in alcohol screening and brief intervention, as well as a decreased sense of control in the behavioural outcomes of alcohol-related injuries. While attitudes, social norms and self-efficacy have been identified as important theoretical constructs in many studies, their effects in this sample appeared to operate in a more indirect manner. The strength of intervening was increased four-fold by perceived behavioural control. As such, the hypothesised model was able to identify a unique set of clinician characteristics typical of high intentions to intervene in alcohol-related injuries in the ED.

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All praise is due to the Creator of the Heavens and the Earth.

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This work is dedicated to the temporal continuum of my life-the beginning and the end. The beginning, starts with my Father who knew of this work before I was even born. The end, continues with my oldest Son whose experiences and lessons learned are hoped to out shine my own.

To the Jami'ah (Community) in Ann Arbor, Michigan who know the true meaning of Jami'ah!

INTRODUCTION

Overview and Scope of the Problem

Alcohol use is a leading risk factor for global injury and disability (1, 2). As injuries are often repeated events, certain individuals remain at high risk of trauma recidivism and death years after hospital discharge (3-5). The characteristic that stands out most in this high risk group of injured emergency department (ED) patients, is excessive alcohol use (6, 7). Identifying and intervening in alcohol-related problems has substantial potential for injury prevention in public health, but the implementation also faces significant challenges. In terms of service provision, hospital EDs are positioned as "front line services" to meet this public health challenge via implementation of evidence-based interventions. Unfortunately, the intention to embrace and implement evidence-based practice (EBP) such as alcohol screening and brief interventions (SBI) in the ED has not been explored in great detail in the Australian published literature. There is a dearth of theory-informed research to explain why there is such a lack of evidence-based responses to alcohol-related injury (ARI) in the ED. A notable exception is a recent Australian study which identified formidable barriers to EBP, such as the adverse effect of disruptive and aggressive behaviour of alcohol-affected patients on ED operations and patient care (8).

The current investigation addresses the challenge by reviewing the literature on ARI and existing evidence-based responses that build upon public health models and theories. The research aims to use mixed methods (qualitative and quantitative) to examine the current Australian ED response to alcohol-related injury. The rationale for this investigation underscores the observation that early recognition of, and intervention in, risky alcohol consumption has been demonstrated internationally to be an effective measure for reducing the overall harm associated with the consequences of alcohol-related problems – both for individuals and the broader community. Brief interventions, at least in some studies, have

also been associated with potentially reduced health care costs in terms of decreased re-admission rates.

In the first chapter, the literature on alcohol consumption and its global burden will be reviewed. How ARI is related to alcohol consumption will be presented as well as epidemiological data that describes the impact this has had on emergency departments. Chapter two will outline the general response to alcohol-related problems and highlight screening and brief interventions as evidence-based public health responses. This epidemiological data on alcohol-related injury provides the contextual background that, from a theoretical perspective, is essential for a thorough exploration of the problem of interest, and necessary to initiate any meaningful investigation into not only the problem itself, but also potential responses and solutions. In chapter three, a theoretical framework is proposed to underscore the importance of clinician behavioural intention as part of an informed medical response. This framework will also serve as the focal point for initiating a mixed-methods approach to collecting data that investigate current clinician responses (summarised in chapter 4). This will be followed by chapters 5 and 6, which explain the methods and statistical analyses used in the qualitative and quantitative projects that empirically explored clinician behavioural intention. Findings from this aspect of the study may be integrated into the development of interventions that enhance the Australian response to alcohol-related injury in the ED.

Terms Used

While the phrase 'alcohol-related injury' may appear intuitive, the term 'injury' deserves some specification. In general, injury has been used to categorise chronic and/or acute harm or damage sustained by a person, and in the current context is centred around alcohol use. There can be different modes or causes (deliberate or unintentional acts) that impact on physical and/or psychological wellbeing. Whether these events occur over a period

of time (e.g. gastritis, cancer, cirrhosis) or as an acute incident (e.g. assault, car accident, acute intoxication), the injury can result in an ED presentation. According to WHO Collaborative Study Group on Alcohol and Injuries (2007), alcohol-related injury has been determined by a positive self-report of alcohol consumption in the six hours prior to the occurrence of an injury or positive breath alcohol analysis (63). It should be noted that this definition may be inconsistent with some studies and meta-analyses referenced within this document. For example, some injuries incorporate harm to others, or the damage sustained as a result of someone else's drinking. While "injury" itself may have well-defined parameters, according to ICD injury codes, some medical and community-based studies also referenced herein may vary in application of the term. In addition, this varied pattern of "injury" definitions contributed to the inconsistent finding across the ASBI published material as noted in various sections of chapter 1. Such discrepancies were acknowledged throughout this thesis and again summarised as a limitation in the study methodology with recommendations for improvement in the final chapter. When discussing study results, particular attention will be dedicated to comparisons based upon similar definitions.

Throughout this thesis at-risk, risky, hazardous and harmful drinking and/or consumption will be used to distinguish the various aspects of alcohol use that put an individual at risk of harm and injury. These terms have been interchangeably used throughout the clinical literature and empirical research with varying distinction in the degree of inherent morbidity and mortality. Although it is conceptually relevant to identify those subtle differences, that distinction will be of minimal consequence in this study. This is because according to WHO definitions, both hazardous drinking and harmful drinking exist along the continuum of drinking behaviours that lead to injury and harm. Although the former involves actual harm, neither are wholly indicative of dependence, which is less amenable to brief interventions.

While this research takes into account the important clinical differences between alcohol ‘dependence’ and ‘non-dependence’, conventional terms such as “alcoholic”, “abuse” and “misuse” associated with varying levels of drinking behaviour will be used in direct quotations from the referenced source. This is to highlight the importance of distinguishing between medically relevant criteria and language that can be imprecise and perceptively pejorative. However, in the context of history reporting in this field, this language is germane to the topic of concern. ‘Drinkers’ will refer to the population of individuals who consume alcohol at any level. Emergency department clinicians and/or practitioners will include medical doctors, nurses, social workers and allied health professionals except where explicitly stated otherwise. ‘Clinician’ will also be interchangeably used with ‘staff’ or ‘provider’, and refers to the same group of practitioners who work in a clinical capacity.

The following designated abbreviations will be used throughout the document:

(AASW) Australian Association of Social Work

(ACEM) Australasian College for Emergency Medicine

(AAF) Alcohol-Attributable Fraction of Injury

(ARI) Alcohol-Related Injury

(ARP) Alcohol-Related Problem

(ASBI) Alcohol Screening and Brief Intervention

(BAC) Blood Alcohol Concentration

(BI) Brief Intervention

(CENA) College of Emergency Nursing Australasia

(DALY) Disability-Adjusted Life Year

(ED) Emergency Department

(EBP) Evidence-Based Practice

(EBR) Evidence-Based Response

(HED) Heavy Episodic Drinking

(ICD-10) International Statistical Classification of Diseases and Related Health Problems 10th Revision

(MI) Motivational Interviewing

(PBC) Perceived Behavioural Control

(RCT) Randomised-Control Trial

(RL) Role Legitimacy

(SBI) Screening and Brief Intervention

(SBIRT) Screening, Brief Intervention and Referral to Treatment

(SEM) Structural Equation Modelling

(SN) Social Norms

(TPB) Theory of Planned Behaviour

(TRA) Theory of Reasoned Action

(WHO) World Health Organization

CHAPTER 1: ALCOHOL-RELATED INJURY RESEARCH

1.1 Alcohol Burden of Illness and Disease

It is estimated that over two billion adults worldwide consume some form of alcoholic beverage and 4.1% of those over 15 years of age experience alcohol use disorders (1). Alcohol use disorders can be of three primary types:

- Hazardous use is the pattern of alcohol use which increases the user's risk of harmful consequences. This could be limited to mental and physical aspects; however it is common to also consider the social consequences. This particular pattern of use is of public health significance despite the absence of meeting diagnostic criteria for a clinical disorder;
- Harmful use is a pattern of alcohol consumption associated with many problems that is causing health damage. These problems may be related to physical health (e.g. cancer, liver cirrhosis), mental health (e.g. depression), or other lifestyle factors (e.g. legal problems), secondary to heavy, chronic and/or acute consumption. This terms has diagnostic relevance in the ICD-10;
- Dependent use, which refers to a cluster of biopsychosocial phenomena that are related to repeated alcohol use. This is typically associated with a strong desire to use more alcohol, despite harmful consequences and reduced ability to control its use. The consumption behaviour can interfere with other obligations and responsibilities, may manifest in heightened tolerance and a physiological withdrawal state in the absence of alcohol (9, 10).

Globally, alcohol use has been responsible for more than 3.3 million premature deaths each year which is the equivalent of 5.9% of all global deaths (11). Alcohol has been reported as the world's third leading risk factor for disease burden and is the third leading modifiable risk factor cause of total mortality in the United States (2, 12). For some countries, the alcohol-related burden of disease accounts for approximately 8% of the total disease and injury burden related to disability-adjusted life years (DALYs; (12-14)). As a leading risk factor for illness and death associated with intentional and unintentional injury, alcohol consumption is related to a substantial proportion of the DALYs due to injury (15, 16). Chronic alcohol consumption is strongly associated with cardiovascular and neuropsychiatric diseases, various cancers and cirrhosis, whereas acute use has been associated with road injuries, suicide, child abuse, drowning, falls, and other unintentional injuries which are primary causes of death globally (12, 17). Evidence of site-specific alcohol-attributable cancer makes a strong argument for the causal effects of alcohol in cancer onset (18). The latest WHO

cancer report showed the percentage of Australian cancers directly attributed to alcohol was 2.5% higher than the global figure, which some have argued is due to a higher than average alcohol consumption in Australia (19-21).

In some public venues where alcohol was served, rates of interpersonal violence and assaults have been known to increase significantly (22, 23). It is estimated that 39% of all fatal motor vehicle accidents are alcohol-related (24). These alcohol-related problems have invariably resulted in hospital presentations and not just for a small proportion of very heavy drinkers-a significant proportion of the population is affected. In Australia, the death toll from risky and high risk alcohol consumption has been substantial, with 31,133 deaths and 577,269 hospitalisations over one investigated 10-year period (25). Prior to 2010, national alcohol consumption levels had slowly increased over a 20-year period (26). In spite of the methodological challenges to accurately identify population trends and given the widespread availability of alcohol in Australia, there has been a consistent and significant effect of alcohol consumption on injury and increased ED presentations, which are on average, 10 times the rate of hospitalisations (27).

There has been contention about the presumed negative effect of alcohol on general well-being (28). Some studies suggested that there is a protective benefit in the use of alcohol when it comes to light and moderate drinking (29-31). For example, a positive correlation has been shown between light to moderate alcohol consumption in middle-aged men and reduced coronary heart disease death (29). Research has clearly demonstrated a dual relationship between average dosing and mortality risk, whereby some consumption levels may provide more benefit than abstinence and high doses may result in elevated health risks. Known as the "J-shaped curve", this effect has been fairly consistent across most studies of alcohol consumption (32-35).

However, the contention continues about methodological flaws around the studies suggesting light consumption confers health benefits due to confounding and selection bias (36, 37). For example, Fillmore (2006) and others have identified misclassification errors in studies that included occasional drinkers in the abstainer category. In addition, there has been evidence that alcohol use gradually decreases to the point of abstinence in ageing populations as well as those with pre-existing health conditions. Thus, including these groups in an abstinence category when they are more vulnerable to illnesses such as coronary heart disease introduces additional bias into studies that propose a protective effect for alcohol use. Elsewhere, it has been demonstrated that the evidence for the benefits of alcohol consumption are outweighed by the harms of drinking (38, 39). Those harms are most obvious in the death tolls, disabilities and loss that swell public health statistics particularly for young Australian males (40).

Other methodological issues have been noted in studies that attempted to identify population sources of the problem. For instance, in a cross-national investigation of 16 countries, discrepancies were revealed in rates and variations of ARI across EDs (41). ARI was not only influenced by individual levels of consumption, but also by societal characteristics of drinking including regulatory policies and cultural drinking patterns. Furthermore, controversy exists in terms of whether these problems are the result of a small segment of dependent persons who drink heavily, or due to the vast majority of all consumers of alcohol who occasionally experience adverse consequences, those more likely to be identified by 'harmful use'.

It has been argued that the bulk of a society's alcohol problems are the consequence of large numbers of people who consume beyond recommended drinking levels without meeting clinical criteria for dependence (42, 43). That is, the population attributable fraction of alcohol-related injury is more closely associated with occasional risky consumption than with

dependence, a phenomenon known as prevention paradox (44). The prevention paradox considers two realities for having the greatest impact in reducing population level alcohol-related problems: to focus on reducing the consumption of dependent individuals or reducing alcohol consumption in hazardous and harmful drinkers. Recent research has provided empirical support for the prevention paradox, where the latter group of non-dependent risky drinkers were responsible for a greater proportion of the absolute harm that results from heavy episodic drinking (HED) (45, 46). That is, evidence has supported greater efficacy in prevention efforts that focus on non-dependent drinkers, where most alcohol-related harm occurs at the population level.

This has resulted in research recommendations that emphasise discrete types of screening and brief interventions for non-treatment seeking, non-dependent risky drinkers (47). Recently noted was the possibility that at-risk alcohol use predicts repeat ED visits for ARI and trauma (48). To address the prevention paradox, investigations have explored new ways of calculating the actual disease burden of alcohol by using methodological strategies that discretely define factors in the problem (49). Given the previous discussion on benefits and harms, most conclusions drawn agreed that there is a significant relationship between non-dependent drinking and injury, and this underscores the need for a multi-method public health response (50).

The identification of and intervention in alcohol-related problems has great significance for injury prevention in society (51, 52). Emergency departments have been an ideal location to intervene with injury patients as they seek treatment (53-56). In the same vein, the ED is a good place to examine clinician-based responses aimed at reducing risk of subsequent injury (57-62). In the following sections the concepts of alcohol consumption and injury are examined and how burden of injury is attributed to alcohol, before exploring the specific response to these types of presentations within Australian EDs.

1.2 Estimating the Impact of Alcohol Consumption on Injury

Combined evidence throughout the world suggests that 10-18% of the injuries presenting to EDs involved alcohol (63). While this estimate may include some downward bias, other estimates have suggested higher proportions in countries where there is a different "normed" pattern of drinking. For example, a cross-national meta-analysis found 64% of patients reported drinking alcohol within the six hours prior to the incident that resulted in an ED presentation (64). In Australia, 28% of ED injuries have been attributed to any level of drinking within the six hours preceding the incident (65).

Most recently, a study conducted by the Australasian College for Emergency Medicine (ACEM) (66) examined the proportion of Australia and New Zealand ED presentations that were alcohol-related. Data were collected at 0200 hrs from 106 hospitals using a point prevalence approach. Although the data were positively skewed (values were clustered at the low end of scale), up to half of the patients in some EDs during the study hour presented with an alcohol-related issue. The study concluded that, on average, just under 15% of all early morning ED presentations involved alcohol, which may be an underestimation as noted in previous studies (66). For example, Humphrey et al, 2003 reported 35% pre-injury alcohol consumption rate amongst ED patients in New Zealand, whereas Williams et. al, (2011) reported 17% in Australia. As noted in Indig et. al, (2007), these figures tended to vary by disaggregated characteristics of the population. For instance, compared to older patients, younger patients (16-29 year olds) reported high-risk drinking three times more frequently, with males (19.6%) engaging in greater consumption than females (15.4%) prior to ED presentation (67). On the basis of ethnicity, risk ratios also vary across drinking patterns with, in the USA, elevated levels found amongst black and Hispanic groups (68). Nevertheless, these studies affirm the significance of alcohol-based harm and the need for better public health surveillance of the true impact consumption has on injury (69).

Estimating the role of alcohol consumption in its contribution to injuries is a major undertaking, but has been necessary to contextualise how Australian EDs respond to alcohol-related problems (70). One study attempted this task, although it was challenged by the lack of standardised procedures in Australian hospitals for reliably recording cause of injury (65). Accounting for any level of drinking in the 6-hour period preceding the injury, over a quarter of ED injury presentations were attributed to alcohol Australia-wide. Considering there are over 180 public EDs throughout Australia, there is likely to be substantial variation in this estimate. For example, urban hospital studies reported ~33% of all injured patients interviewed have consumed alcohol within six hours of the injury (71, 72). In another study, quantification of per capita prevalence and differential costs of alcohol crashes demonstrated 'rural' alcohol-related fatal crashes accounted for a disproportionately large fraction of the harms and costs associated with such crashes compared to 'urban' communities (73). That study found that while the overall total costs of alcohol-related traffic crashes is four times higher in urban vs. rural areas, the rate per 10,000 population is approximately seven times higher in rural than urban areas. This necessitates caution not only in drawing conclusions about ED-based prevalence in the two environments, but also requires a different method to understanding how and why clinician detecting and intervening in alcohol-related injury may have varied in each setting (74, 75).

Two major works exist on an international scale that focused on research of alcohol and injury in the ED: WHO-Collaborative Study on Alcohol and Injury (76) and the Emergency Room Collaborative Alcohol Analysis Project (ERCAAP) (64). The ERCAAP, a cross-national meta-analysis of alcohol and injury, found a moderately robust relationship for blood alcohol concentration (BAC) and self-reported use with ED presentations for alcohol-related injury. Similarly, the WHO Collaborative study found a positive association between injury and even low levels of alcohol consumption. In that particular study, risk of injury increased

with consumption of one drink (OR= 3.3; 95% CI=1.9-5.7), while the risk increased by a factor of 10 for individuals who reported having six or more drinks six hours prior to the incident. These studies definitively established the association of alcohol consumption with injury on a global level. However, there has existed a need to explain the real magnitude of association in relative risk terms, and while there have been several means to do so, it has been convincingly argued that the relationship between consumption and injury was best analysed with ED studies (77).

Acute alcohol intake (via self-report on the amount consumed 6 hours prior to injury) has been commonly used as the primary exposure measure and BAC was an alternative method of determining dose exposure. Distinctions have existed however, between patterns of drinking in relation to likelihood of injury, even when consumption levels were the same prior to injury. More specifically, *patterns* of drinking such as heavy episodic (commonly referred to as binge drinking) were found to be more strongly associated with injury than *amount* of drinking. In addition, usual drinking patterns were more likely to moderate the association between acute intake and injury (77). Regarding the comparative aspect of ED studies, different consumption patterns in different ED populations also partially explained variations in risk relationships across countries and regions within a country (41). Furthermore, risk relationships may be different as a result of cultural drinking factors on local and regional levels (64). Primarily due to such methodological challenges, it has been difficult to derive estimates of aetiological fractions of alcohol-related injuries in a country via ED studies only. These types of analyses typically required a three-way interaction model, whereas most studies have only estimated main effects. Nevertheless, existing recommendations identified ED studies as the best possible choice at present to estimate the impact of consumption on injury and warrants a review of study designs to further contextualise staff responses to the problem (77).

1.3 Conceptualising Alcohol-Related Injury

Almost three decades ago, observations made by Foege suggested alcohol is the "AIDS virus of injury control" because it "lowers the defences and immunity to injury" (78). This observation provides an instructive view of the problem and underscores the need to recognize its aetiology before developing an informed response to address that problem. In the case of alcohol consumption, epidemiological evidence has suggested the harms outweigh the benefits (16, 79-82). However, measurement of this evidence has been inconsistent (83). In addition, interventions relying upon inaccurate measurement of the evidence (i.e. key drinking variables) have been equally varied in their outcomes. The following sections elaborate on recent efforts to achieve accurate problem measurement. This includes a review of ED study designs that were developed to more appropriately contextualise the risk relationship between alcohol consumption and injury. These sections will cover recent improvements in measurement accuracy that have subsequently driven more reliable alcohol interventions. It will be demonstrated that certain designs have contributed to increased likelihood of measurable and valid outcomes. A review of intervention efficacy will emphasise advantages of implementation and establish the rationale for a clear response from ED clinicians. The uptake of effective interventions and the potential public health savings will be summarised within the context of the impact of alcohol-related injury on the critical care response.

1.3.1 Defining the Rate-Risk Relationship

To contextualise the problem, alcohol consumption fulfils basic epidemiological conditions for causality in many injury outcomes (84). That is, alcohol use satisfies the role of a contributing factor for an outcome such as traffic crashes because:

- Alcohol is undeniably associated with the outcome (increased use increases injury risk);
- A dose-response relationship exists (higher blood concentration means higher injury chance);
- The relationship is substantiated with physiological evidence (alcohol can impair functioning); and,
- Alcohol-reduction interventions can reduce alcohol-related incidents (crashes).

These causality criteria are strongly established for alcohol in the case of traffic crashes, but have required ongoing research to establish the same in other forms of alcohol-related injuries (84). To illustrate, a dose-response relationship denotes a proportional exposure-risk association between two factors. Chronic conditions such as cancer, neuropsychiatric disorders and cardiovascular diseases are known to have a dose-response association with patterns of drinking. Similarly, in the case of alcohol-related injury, consumption levels (dose) are proportionally related to injury risks (response). Thus, as alcohol consumption increases so does the risk factor for morbidity/mortality. That is, there is an observed increase in risk of motor vehicle crashes, falls, cycling injuries, interpersonal violence, and intentional injuries with frequent heavy drinking and recurrent drunkenness (85). Nevertheless, conceptualising the problem and designing a feasible method for evaluating it has been challenging. More recent efforts have addressed this challenge by differentiating between the 'risk of alcohol-related injury' and 'injury risk associated with drinking' in order to determine the attributable fraction of injury due to alcohol consumption (15).

Since injuries are a 'countable' factor, investigators have been led to believe the burden/harm can be calculated by counting injury cases in the ED. Recent studies have identified more reliable measures that extend beyond mere counts to get an accurate conceptualisation of the burden of alcohol consumption. A more informative way to study aetiological fractions of alcohol-related injuries in a country involves estimation of risk relationships (77). While this measure is difficult due to methodological reasons, it has been more reliable than pure prevalence designs to extrapolate from injury cases in the ED.

Zeisser et al (2013) have pointed out limitations with ED-specific studies in terms of estimating the risk relationship between alcohol consumption and injury. They suggested that study samples have not always been representative of non-treatment seeking populations,

leading to an exaggerated effect of alcohol's influence injury. For example, ED literature draws upon three primary forms of controlled study designs:

1) ED case-control: the same ED is used to select both case and control patients over the same time period
2) Case-crossover: cases serve as their own controls
3) Population case-control: cases are selected from a pool of ED patients and controls are taken from a non-ED setting in the general population

Cherpitel (1992, 2007) demonstrated non-injury ED control patients were more likely to have a heavier drinking profile compared to population controls. This evidence suggests that ED case-control designs are less likely to capture the true magnitude of the alcohol-injury relationship due to underestimation. With case-crossovers, the primary limitation involves statistical "adjustment" for usual consumption patterns and greater recall bias during the "control" period. This results in an overestimation of the alcohol-injury relationship and inaccurate effect size estimates. Compared to both ED case-control and case-crossover designs, population case-controls are presumed to be more robust in estimating the alcohol-injury association (86). Part of the reason is because population case-controls use demographic match criteria as well as drinking behaviours/activities individuals engaged in concurrent with the time their matched "case" was injured.

In light of this evidence, injured and non-injured patients in an ED probability sample may not have been representative of the general ED population (86). It may be that those groups studied most often in the ED were more frequent users of ED services. This has possibly led to an inherent sampling bias which affects the ability to accurately account for alcohol consumption and its relative burden of disease. As such, there are implications for how alcohol-related injuries are matched with controls when they present to the ED. Notwithstanding these methodological challenges, there has been a general consensus that many ED cases are clearly alcohol-related. And while there has been contention on how to arrive at the most accurate proportion of cases, even the most conservative estimates

suggested a significant number of injured persons presenting to the ED are alcohol affected (66, 87).

In evaluating how risk of injury is related to alcohol consumption, investigations have used diverse methodologies and produced diverse findings. For example, some study designs have varied widely in the way they assessed magnitude of risk, the dose-response relationship, as well as usual drinking patterns (41, 88). Providing further clarity on this issue, Gmel et al., (2006) used a study design that focused on four 'usual drinking' categories of injury patients arriving at the ED within six hours of the incident. The categories ranged from abstention and low risk drinking to heavy episodic drinking. Results demonstrated how differences in study design alone have produced underestimates of the relative risk of injury due to alcohol (in ED case-control designs) and upward biases when usual frequency methods were employed, which were subject to recall bias (as in case-crossover designs). Furthermore, aggregation of lifetime and recent abstainers has been a central issue in many studies that resulted in findings indicative of a J-shaped curve for dose-response effects in experimental designs (89, 90). This was likely due to a classification error especially when such groups were compared with moderate drinkers without controlling for pre-existing conditions. For example, studies have classed as current abstainers, those who stopped drinking due to illness, or medication requirements, or ageing effects. In this regard, the abstaining group appeared more unhealthy relative to moderate drinkers (91). As such, quantification of disease and mortality attributed to misclassification yielded conflicting results associated with problematic study designs. Nevertheless, most studies have supported the association between acute alcohol consumption and injury morbidity and mortality (55, 92).

1.3.2 Alcohol-Attributable Fraction of Injury

The Alcohol-Attributable Fraction of Injury (AAF) is a formula used to calculate the burden of injury due to alcohol in a society (i.e. alcohol-attributable injury) (15, 65, 93). Both *risk* of injury related to alcohol (relative risk of being injured when drinking) and the *rate* of alcohol-related injury (probability of drinking among injured persons) constitute the 'injury prevalence attributable to alcohol'. In other words, both risk and rate are necessary to calculate the overall AAF, particularly in ED case studies. Previously, most methodologies incorporated one or the other, resulting in the above mentioned inconsistent findings across studies (86).

AAF have previously been used to understand how population-level alcohol consumption impacts upon the burden of disease framework. The burden of disease framework provides a method for linking population level information with disease contributing factors and related health outcomes including ARI (70). This in essence allows calculation of case proportions of injury in the population that can be directly attributed to specific gradients/patterns of alcohol consumption ranging from abstinence to heavy episodic or continuous drinking. For example, based on 2007 Australian data, it was estimated that the AAF for ED injuries at any drinking level 6 hours prior to injury was 28% (65). In a specific instance, state-level modelling was conducted to illustrate the application of this method, which showed several thousand ED injuries were attributed to alcohol at a rate above 1 in 4 (70).

Current work has demonstrated that there are independent contributions from two factors when considering risk of harm due to alcohol consumption: patterned drinking; and, volume consumed (70). Until recently, Australian disease burden estimates had not considered these factors accurately, particularly the harmful exposure associated with HED. By disaggregating volume and pattern, better predictions of relative injury risk can be

achieved, particularly when modelling the interactions between HED and volume averages of consumed alcohol (65, 86). As a result of more accurate distinctions between the components of consumption, measurement of injury prevalence related to alcohol has improved. Thus, a closer examination of how accurate injury measurement is, becomes helpful not only for intervention efforts, but also to reduce the likelihood of diverse findings in evaluations that employ such measurement.

1.3.3 Injury Measurement and Rationale for Intervening

The field of injury measurement is vast and has been developed over the years to occupy an important position in the medical literature (3, 94). Much of the public health literature highlights the importance of accurate measurement and early intervention to reduce risk factors related to injury susceptibility and limit severity where possible (82, 92, 95). This includes accurate definitions and understanding of what "risk" is and how "risk factors" work (96). Poor measurement of injury has subsequently impacted the reliability of interventions by limiting predictability of outcomes. Hence there has been an emphasis on accurate measures of the magnitude and effect of alcohol in its association with injury risk factors to better evaluate efficacy of ED-based interventions (97).

When injuries do occur, measuring the burden and impact generally fall into two categories of fatal and non-fatal injury. Fatal forms have been measured using death counts and rates as well as years of potential life lost. Non-fatal forms involve measuring the rates of health service usage and hospitalisations, disease rates, and severity (Injury Severity Score-ISS). For example, the use of injury scales has involved a survival risk ratio or the probability of survival. This ratio is calculated from the number of patients with a particular injury code who have not died, to the total number of patients with that code (98). These measurements

have been important because they provide a basis for establishing trends in population incidence of injury and those factors that may be causally related. Consequently, injury has been identified as a leading cause of mortality and morbidity in Australia and New Zealand (99). As the second highest hospital admissions expenditure, injury accounted for over $3 billion of the Australian health care costs between 2004-2005 (100).

Surveillance strategies have identified a range of drinking levels that pose significant risk for injury, thus requiring a comprehensive response across a continuum of consumption patterns (76). To add, identification of strong causal factors such as drinking have been the impetus for developing specific alcohol interventions as a means of reducing risk of future injury (101, 102). Surveys of injury populations in EDs have revealed a high prevalence of alcohol consumption prior to injury. For instance, a Queensland ED study reported 45% of the study sample reported drinking alcohol 24 hours prior to injury and of those males who drank within 6 hours of the injury, just under 70% consumed at levels designated by NHMRC as harmful (103). Similar investigations reported patterns of consumption that consistently increase risk for injuries leading to ED presentations and opportunities for alcohol-focused interventions across Australia and New Zealand (104-106).

Costs associated with ARI in the ED have substantiated the economic need for responding to hazardous or harmful alcohol use. In high-income countries, alcohol consumption costs have represented more than 1% of the gross national product, which is intrinsically linked to wealth (16). That is, there is a strong directly proportional relationship between economic wealth and overall volume consumption- when gross domestic product increases, so does consumption. It has been well demonstrated that compared to non-ARI visits, ARI visits to the ED result in increased expenditures due to heightened use of ambulance services, more diagnostic testing, longer ED stays and greater chances for admission (107). One Sydney-based study identified just over 33% of its injured ED

population as having consumed alcohol in the six hours prior to injury. A case-mix classification was conducted to determine the weighted average cost for treating ARIs (72). In the analysis, it was estimated that the annual cost of alcohol to that particular ED was $1.38 million in 2004/05. If indirect costs were included, such as admission to hospital, rehabilitation, loss of income and psychological distress, the overall expense would be increased by an additional $1.8 million during the same period. In short, the burden of ARI carries an economic contingency that warrants a strategic response.

Distinguishing between fatal and non-fatal vehicle crashes has also been important for injury measurement given the obvious influence on burden of disease. As an example, a study of crash risks in rural Australia controlled for human factors and found vehicle and road conditions made little contribution to the severity of the crash outcome (108). The chief human behavioural factors which did contribute significantly to the fatality outcome included vehicle speed and alcohol. In particular, alcohol was considered a strong contributing factor to the severity of the crash even after controlling for its indirect effects on speeding. Police reports suggested alcohol was a contributing factor in approximately 30% of fatal crashes whereas it contributed to only 18% of non-fatal crashes. This study also reported just under half of the recorded crashes occurred over the weekend period (defined as from 1800hrs Friday to 0000hrs Sunday) which has overlapped with the time frame for reported increases in alcohol-related presentations in the ED (66, 87, 109, 110). In general, severe injuries entailing extensive treatment and enormous costs have had a greater association with alcohol than those without (111). As a potentially avoidable risk factor for injury and associated fatality, alcohol consumption has attracted significant attention in the public health literature investigating intervention models and strategies (15, 16).

1.3.4 ED Alcohol-Related Injury Interventions

A number of strategies have been applied to determine the best way to intervene in ARIs when they present to the ED. Some approaches have identified alcohol screening as a reliable measure for determining the risk of future injury (112). This in conjunction with brief interventions has received continuous exploration over the last few decades (53, 55, 113, 114). There is a noted contribution in the research literature linking concurrent injury hospitalisation and alcohol intoxication with increased risk of subsequent readmission due to trauma (115). Interventions ideally need to increase patient awareness of the connection between alcohol consumption, their injuries, and related future risks. The use of injury as a motivator to change drinking behaviour has achieved some degree of effectiveness using Screening, Brief Intervention and Referral to Treatment (SBIRT) models in various settings including hospital EDs (116). Intervening in such potentially preventable incidents offers conceivable public health cost savings that would have a significant impact on the national burden of disease as well as quality of life for those at risk. Moreover, screening and brief interventions implemented with fidelity, have potential for considerable population-level effects even with small effect sizes across studies, given the large proportion of ED attendees engaged in risky drinking practices (117-119). The next section provides evidence for the effectiveness of ARI interventions within the ED and trauma setting. It bespeaks the importance of delivering ED-based interventions, whether they be secondary or tertiary, to patients arriving with alcohol-related injuries.

1.3.5 Synopsis of Measurement Accuracy and Intervention Effectiveness

An accumulation of empirical evidence has exhibited the effectiveness of alcohol interventions in medical settings (120-123). This evidence has been particularly reliable when accurate measurement was employed. For example, randomised control trials (RCT) conducted in trauma centres and EDs have employed detailed measurement of both injury severity and drinking patterns to predict specified outcomes such as risk of re-injury, alcohol-

related violations and changes in alcohol use (102, 124). As outcome categories were well defined, more reliable conclusions about intervention efficacy were able to be drawn. For instance, a prospective RCT used Injury Severity Scores and other pre-intervention measures to classify injured patients with mild to moderate alcohol problems (102). Using 12-month trauma recurrence and alcohol use change as outcomes of interest, results showed significant post-intervention reduction in consumption (measured as drinks per week) was related to a 48% reduction in re-injury (injury necessitating ED or trauma centre admission). Similar studies have recommended accurate interpretation of intervention effects must rely heavily upon detailed measurement to achieve valid and reliable results (125-128).

An ED-based quasi-experimental comparison design was employed to evaluate SBIRT effectiveness across 14 diverse ED settings and patient/provider populations (129). At the onset, this study used a standard screening tool to distinguish between dependent and at-risk drinkers (patients who reported drinking above national guideline low-risk limits). At 3-month follow-up, 28% of the intervention group was drinking below the low-risk limit compared with 18% of the comparison group (difference of 9.3%; 95% CI: 3.3-15.3%). This translated into an average reduction of approximately 3.25 drinks each week amongst intervention participants. Measurement accuracy was central to this study, which emphasised the clinically meaningful difference between dependent and at-risk drinkers in determining SBI effectiveness in the ED. Studies which have not made this distinction may have failed to find effectiveness, overlooking the fact not all brief interventions are clinically indicated for dependent drinkers (129-132). Hence an emphasis on strategic interventions that are consonant with accurate measurement and achievable outcomes.

The effectiveness of any given strategy is incomplete if it lacks acceptability and support amongst intended beneficiaries and stakeholders. Several investigations have also explored this aspect of the response and have found SBI favourable amongst patients as well

as clinicians (133, 134). Some investigations however have noted contrasts in patients' expectations and clinicians' assumptions about queries into drinking behaviour. That is, clinicians believed asking about patient drinking behaviours was too intrusive, whereas patients felt that it should be part of their clinician's role to ask (135-137). A national study of ED directors indicated the vast majority of senior management felt it was within the scope of ED practice to implement screening and brief intervention and most directors endorsed support (138). Nevertheless, it is critical to ensure providers themselves feel it is part of their role and responsibility to engage in such public health practices (139). In this regard, it has also been important to consider clinicians' personal attitudes and beliefs around alcohol and the way this may impact intervention implementation and outcome efficacy (140-143).

In summary, a chief concern has been how to effectively measure and intervene with ARI cases in order to reduce the overall burden of injury associated with drinking alcohol. As noted in various SBI reviews, it has been critical to explicitly identify the context, mechanism and outcomes of any response particularly in the form of a targeted intervention (144). This includes use of appropriate screening tools and well-defined measures of categories of interest such as injury severity, consumption patterns and re-injury rates. Previous studies and a most recent review have indicated that lack of precise measurement will ensure variations in outcomes and results (145). Such variability negatively impacts timely referral to appropriate care and service utilisation (146, 147). Using risk/rate relationships conceptualizes ARI in a way that accounts for important factors such as injury incidence, local drinking cultures and patterns, policies that regulate consumption and other public health responses. In addition, such estimates provide better accounting of the prevalence of alcohol-related injuries and subsequently permit improved strategies for developing effective responses. Adequate conceptualisation of the alcohol-attributable fraction of injury also supports proper evaluation of the potential impact clinician behavioural responses have had

on the problem. This in turn has been used to estimate more comprehensive outcomes such as the impact ED-based interventions can have on the disease burden caused by ARI. As a result, the designs of recent research initiatives have built upon more practical measurements and conceptualisations of the problem thus narrowing the number of factors explaining any significant variation in study findings. This ultimately increases precision in study designs and underpins the need for a theory-based investigation of clinician behaviour in relation to alcohol-related problems as will be further explored in chapter 3. That investigation however, is prefaced by a closer examination of how injury measurement requires adjustment for the impact of alcohol consumption in order to further reduce variability in outcomes.

1.4 Review of Emergency Department Study Designs

Having established that there has been contention regarding which study design was best for estimating aetiological fractions of alcohol-related injury, and given expert recommendations that EDs are the best setting at present, a review of study design types is warranted. As mentioned previously, estimation of risk relationships has been more informative than pure prevalence studies especially in cross-country comparisons. Risk estimation was accomplished by considering several factors including drinking culture of the country, drinking styles/patterns typical of the ED region as well as location of injury, injury mechanism, usual drinking pattern in addition to acute intake prior to injury. ED case-control designs as well as population case-control studies have been the typical approach in many studies. Gmel & Daeppen (2009) argued that while these approaches have been necessary, they were not sufficient to eliminate discrepancies due to mixed composition of drinker types in the samples. Nevertheless, compared to non-injury ED patient controls, population case-control designs were more methodologically sound approximations for measuring the alcohol-injury association (77). Using a case-control design and the recommendations from Gmel and Daeppen (2009), a study involving 737 motor vehicle accidents (MVA) assessed

the association between alcohol and drug use and fatal crashes (148). The results indicated that there was a significant increase in the risk of a fatal MVA when driver drug use was involved, and a heightened risk when combined with alcohol. Once again, some caution was warranted when interpreting results since loose definitions of 'impairment' were employed. Also, moving beyond a main effects modality to examine interactions of culture variables was lacking in the study. However, there was added value in this study, which contributes to the growing body of research that refines sound methods and designs for capturing the true magnitude of the effects of alcohol consumption on injury in the ED.

It seems ED studies in the alcohol-injury literature have rarely quantified the moderating effect of usual consumption patterns on acute intake. This was likely due to the complexity of the alcohol-injury association as well as lack of understanding on how to model such a relationship (149). A three-way interaction model has been postulated as the most appropriate means to developing a model. That model incorporated usual alcohol consumption patterns as two dimensions: volume of drinking (e.g. measured by average number of drinks per day in last 12 months); and, heavy episodic drinking (measured as more than 5 drinks on one occasion). This resulted in a 2x2 matrix of four types of drinkers. The third dimension in the model was the acute intake of a particular quantity of alcohol prior to injury incident. To date, only one study in the field is reported to have incorporated this three-way interaction and concluded that while all groups of drinkers face increased risk of injury, individuals who engage in heavy episodic drinking were at particularly high risk (150). This contrasts with previous findings that suggested high-volume drinkers were comparably at lower risk to that of low-volume drinkers when assessed at the same levels of acute intake, because of higher tolerance in the former group (64, 151).

In short, the findings of the previously mentioned study designs resonated with most of the general literature on ED studies involving alcohol and injury which confirmed increased

risk of injury was proportional to the amount of alcohol consumed prior to injury (152). Moreover, a highlight was the quantification of drinkers linked to the most alcohol-related injuries, an important component to incorporate in subsequent ED interventions. It is this complex interaction between consumption and injury that indicates a substantial proportion of alcohol-related morbidity is caused by trauma. With the development of complex study designs, it has been possible to show risk of injury was not only related to dependence and past 30-day hazardous drinking, but that it was more strongly associated with the quantity of alcohol consumed on a single occasion. That is, the alcohol effect on injury risk is stronger in acute exposure as opposed to chronic instances (152). In their conclusion, the authors also suggested the threshold of hazardous drinking may be lower than previously thought. Thus a review of ED study designs further supports the relationship between consumption and injury. It adds to the contextual background that creates the landscape for ED staff who encounter these types of presentations. It further highlights implications for the way staff may be required to respond and it supports the need for a better strategy that focuses on episodes of hazardous drinking in addition to chronic exposure measures such as dependence or usual drinking pattern.

The preceding sections on injury prevalence, ED study designs, and statistics informing the alcohol-injury relationship are important for a number of reasons. First, looking at how injury and alcohol are connected provides a meaningful representation of the burden of disease that ED staff manage. Comprehending the context in which the problem exists facilitates development of an informed response. The epidemiological summary provides a global impression of ARI and the mechanisms by which it impacts on ED services. It invokes a holistic and practical view of the challenge and how ARI presentations impinge on staff priorities and decision-making. Previous models may have inadvertently implied that a small proportion of the population experience alcohol-related injury. This could have biased staff

opinions of the problem, as well as their perceptions of how to intervene. However, when a more precise and comprehensive view is considered, it illuminates the particular challenge experienced by ED staff to contain the issue. This is in light of the increased likelihood of injury recurrence when risky drinking behaviours remain unaddressed/unchanged. In some cases, the ED presentation could be the patients' only meaningful contact with a health professional. Thus, it bears a potential opportunity for early intervention before subsequent/more serious injury occurs. This unfolds on the backdrop of low perceived susceptibility to alcohol-related injury amongst hazardous drinkers, another possible result of models that mis-specify the impact of alcohol consumption on injury. These patients may benefit from a raised awareness of the injury risks when they make contact with an ED professional. This raised awareness may be facilitated via SBI implementation with ED staff who potentially moderate the conceptual link between consumption and its consequences in a 'teachable moment' context. Thus what follows is an examination of the literature on the extent of alcohol-related injuries as they relate to the current ED response.

1.5 Magnitude of Alcohol and Injury on the ED Response

In a systematic literature review and meta-analysis of the dose-response between alcohol and motor/non-motor vehicle injuries, it was determined that the risk of injury increases in a non-linear fashion with rising alcohol intake (92). Contrary to less conservative conclusions, this review suggested no level of consumption was safe for most types of injury. That being said, even such meta-analyses do not reflect all alcohol-attributable injuries within the general population and were therefore unable to capture the true magnitude of effect. This meta-analysis for example, reviewed many studies that included ED data, which for the methodological reasons mentioned above, can contain confounders or conservative estimates. Furthermore, current epidemiological estimates in injury research have explored the impact due to the individual drinker and have not always incorporated the global impact of harm to

others (81, 153). This is a substantial and politically important part of the burden (154). Expectedly, a large part of the mortality and disability attributed to alcohol results from both intentional and unintentional injuries as well as harm to others. Given estimates in WHO's calculation of the Global Burden of Disease 2000, injuries make up just under half of the alcohol attributable deaths (12, 16, 82). From a public health perspective and injury prevention point of view, capturing the true magnitude of effect for alcohol on injury has been essential to developing an informed response.

Surveillance and monitoring of acute alcohol-related problems in general, and injury in particular have been an essential component in most policies that address these harms (155). Unfortunately, responses that have garnered systematic/routine practice in keeping with current trends have been limited in Australia (156). Internationally, monitoring this trend in the ED has served as an indispensable guide for development and evaluation of responses that may reduce or prevent future incidents (15). Notwithstanding, available data suggested alcohol consumption negatively affects not only treatment and recovery in the ED, but has been interpreted as disruptive of clinical efforts to provide timely service (8, 157, 158). In addition, risk and readmission for future trauma are more likely, particularly when presenting alcohol-related injuries were unaddressed within the context of hazardous consumption behaviours (112, 115). As a result, the common response of treating clinicians has varied from moderately interested to totally avoidant of the intoxicated person whom they may see repeatedly (159-161).

While it may be important for the reasons stated above to better account for how and why alcohol-related presentations arrive at the ED, addressing less than effective responses warrants priority. This is because many cases may present and receive treatment for prevailing injuries while the alcohol problem is not identified or addressed and remains a predisposing risk factor for re-injury, impaired recovery and possibly re-admission. This not

only inflates healthcare costs, but also re-introduces the burden of disease and illness through the door of recidivism (162-164). Without question, there is a reason to intervene. Much research has uncovered evidence-based strategies that include screening and brief interventions as effective responses to alcohol-related problems especially when associated with acute injury. Furthermore, latent classes of injury patients have been revealed in well designed studies that delineate subgroup differences in terms of patient outcomes. The degree of positive change experienced by patients receiving ASBI, has been associated with their risk behaviour profile as well as injury history and attribution (128, 165). This has provided support for tailored interventions especially with multiple-risk populations. Whether targeted, tailored, or universally applied, routine responses have not been realised in Australia (75, 166, 167). Various hypotheses suggested individual clinician and organisational factors have an important role in an intervention-based response (59, 60, 168, 169). Thus, it has been critical to examine these aspects within the Australian context in order to determine whether application of SBI can achieve the same degree of positive outcomes observed overseas. The next chapter will take up the issue of the response to alcohol-related problems in general and from an Australian context in particular. This will include exploration of the research on SBI efficacy as a practical evidence-based response to alcohol-related problems.

CHAPTER 2: THE RESPONSE TO ALCOHOL-RELATED PROBLEMS

2.1 Value of Alcohol in a Sociocultural Framework

Sociocultural factors influence the initiation and continued use of alcohol for members within a population. These influences include family and peer effects, demographic characteristics, advertising and media, as well economic and availability factors (170, 171). In fact, some research has determined that year five and six students who had an awareness of beer commercials also had a significant intention to drink once they reached adulthood, which suggested alcohol advertisement may influence a favourable predisposition for drinking in adolescence (172). The role of alcohol as a means of seeking inclusion in the wider Australian cultural context has been explored recently (173). It had been noted that alcohol has been a factor in achieving a sense of belonging and group cohesion; and failure to achieve this sense of connectedness, especially for young people can be devastating (174). One Australian study found that young people had a greater preference for the negative consequences of being drunk rather than experience the social exclusion associated with abstinence (173). Thus, alcohol has a major impact on social capital and this is often exploited through sporting events, marketing and other media campaigns (175). It has been noted that while drinking is central to celebratory occasions, it is also indelibly etched in the Australian culture and nationalism and identities have been shaped through consumption practices (176). For many, the symbolic value of alcohol has had more importance than its functional value (177).

The social construction of meaning and definitions of drinking and alcohol consumption has been intricately connected to the commodification of culture via values, norms and beliefs (178, 179). Such meanings have been central to how alcohol was portrayed and figured into political history as well as how it was addressed as a health problem (180). Accordingly, if alcohol use has been valued as a 'normal' part of the Australian lifestyle, its problematic aspects may fall outside 'normal' processes such as health care. Thus,

responsibility for addressing alcohol-related problems may have been more relevant for police or priests when viewed through the lens of social history. For example, from a sociological perspective, excess alcohol use has been depicted as a problem of 'deviance' requiring a punitive response, whereas from a religious point of view, alcohol in and of itself has been considered a bad thing – 'the demon drink' warranting repentance (180, 181). However, from a medical lens, responses have been primarily focused on addressing the biological malfunction of 'alcoholism' as a physical problem with little differentiation between less severe alcohol-related problems and dependence (182, 183). It has been noted that the disease theory of 'alcoholism' has had a strong basis in the biomedical model underpinning much clinical training (184-186). This has undoubtedly influenced how medical staff perceive alcohol-related presentations (187). Roche et al., (2007) have identified significant changes in the Australian drinking culture that represent an expansion of the culture beyond the public domain. These changes have operated outside individual attributes to produce practices and behaviours in a wider historical and social context. From a sociocultural perspective, this has had significant implications for current responses to alcohol-related problems within Australia in general and EDs in particular.

2.2 Societal Response to Alcohol-Related Problems

The general response to alcohol-related problems has taken on a variety of forms over the last few decades, that has vacillated between a purely medical and specialist response, to community and self-help support networks (188). Each of these types of response generally reflected the social definitions prevalent at the time which were considered an integral part of the sociocultural/value framework in society (189). The response tended to vary from community to community and institution to institution. Nevertheless, alcohol use retained inherent health and safety risks when prevailing values and social definitions of drinking have not prioritised the need for monitoring and intervening in alcohol-related problems. As

such, the position of alcohol amongst those values has had a significant impact on how urgently alcohol problems in a community were addressed (189). Furthermore, the perspectives held by those in the helping professions often recapitulated general societal views. That is, the centrality of sociological models within the medical definition of alcohol use has signified a notable influence of such models which has been elusive even to most sociologists (181). Therefore, noting the position of alcohol in the value system of a society's culture is essential to understanding the response to any related problems, especially in the healthcare domain (190). Reflexively, attitudes, social norms, as well as perceptions regarding the ability to do anything about the problem, can reflect an immense amount of information about the social definitions and inherent value of alcohol and its role in community problems. Assessing these attributes within specific institutions can offer more detail as to how and why certain responses are used (or not used) and the likelihood of successfully addressing the problem.

Within the healthcare domain, attributes reflecting general societal values about alcohol have been measured via the perceptions held by clinical staff regarding alcohol use and alcohol-related problems (58, 191-193). Such studies have demonstrated that societal values held by clinicians have influenced clinical judgement and ultimately impacted the treatment response. For example, more clarity on the relationship between types of 'drinking patterns' and specific alcohol-related 'problems' has helped us to realise that high frequency moderate drinking is more likely to cause cirrhosis as opposed to occasional heavy drinking (194). However, patterns of binge drinking in young adult males seemed to be more highly correlated with injury than moderate and frequent drinking (22, 195). Clinicians who are unaware of these critical distinctions in drinking patterns are likely to hold a general social opinion/idea about alcohol consumption and related problems (196). This general opinion may bias the clinician's response to potential beneficiaries of SBI. That is, the clinician may

hold the societal belief that the young binge drinker is no more likely than an older chronic drinker to respond positively to a brief intervention after a confirmed screen for hazardous alcohol use. Thus, the clinician may feel it is not worthwhile to enquire about the patient's alcohol consumption. Hence it is necessary to enhance staff awareness not only about the distinct relationships between drinking patterns and subsequent problems, but also about SBI as an effective response to the *continuum* of patient drinking patterns for which there may be few standards. Accomplishing this however, requires further appraisal of clinical perceptions regarding alcohol-related problems as well as current responses and practices.

In terms of the relationship between consumption and ARI, raised awareness about potential moderators/mediators such as drinking pattern, gender, age and SES has been only one aspect of the response. Paradigm shifts over the last few decades have challenged perceptions about alcohol-related problems, the theories behind them, and the rationale for treatment as well as ways services were designed to deal with problems (46, 197). Accordingly, there have also been changes in thinking about the nature and extent of the required response (188, 198, 199). No doubt the disease model and ideas of Jellinek and Alcoholics Anonymous were highly influential and have impacted attitudes, social norms, treatment approaches and policy as well as current clinician/staff training. The chronic relapsing disease' of "alcoholism" (a term frequently used to refer to severe alcohol dependence) had primarily been the lens through which many health professional view ARI (problems) and people who experience them (182). The concept of "what" is being treated- from 'alcoholism' (a specific disease syndrome) to 'habit forming substance behaviour' and 'drinking problems', includes a wide range and varying cluster of socially mediated medical definitions (181, 188). In an effort to avoid stigma, patients have utilised indirect means to seek help for alcohol-related problems, or were provided intermittent treatment for unintended injuries that were secondary to alcohol use (200). Even when it may have been

obvious that the presentation was alcohol-related, studies have shown providers either overlooked or were reluctant to enquire about alcohol consumption and respond directly to the drinking behaviour (201, 202).

Providers and patients alike have not always had a clear distinction between what was understood as an addictive disease ("alcoholism") and what is more accurately considered a lifestyle risk factor (harmful and/or alcohol-related problems) (136, 183). This conundrum likely reflects prevalent social-cultural norms and the vacillating attitudes/beliefs held with regards to alcohol and alcohol-related problems (203). Changing the frame of reference from 'addictive disease' to 'risky lifestyle habit' may have been long overdue (200). Notwithstanding, it will be important to get a sense of whether this is the case by sampling perspectives and attributes of the provider population to understand how those values and beliefs inherent in the larger society influence the current medical response. However, it is essential to first review previous responses and efforts to address alcohol-related problems from a larger societal perspective in order to understand how this has impacted smaller domains at the institutional and individual clinician level in Australia.

2.3 Social Strategies and Policy Responses

Concerns associated with the range of alcohol-related problems have been the fulcrum of response developments ranging from community-based prevention and crisis interventions to detoxification and intensive treatment. Examples of social policy and legislative responses to alcohol problems likewise have been numerous and culture-specific (204). They have included pricing and taxing actions, advertising and promotion regulation, venue modification, drink-driving measures and primary care-driven brief interventions. Babor colleagues (2010) have described these responses in one of the more authoritative reviews and a brief summary will be provided below.

2.3.1 Alcohol Pricing and Taxation

Cost has been a critical determinant of alcohol consumption and associated harm. The supply-demand equilibrium has been pivotal to how government-generated revenue was obtained for the prevention of alcohol-related problems. Alcohol taxes and other price controls have been governed by a theoretical assumption that increasing cost of alcohol products would be directly related to a decrease in demand (205). Econometric studies exploring the "inelasticity" of alcohol demand have shown otherwise and highlighted substantial variation amongst beverage categories (i.e. beer, wine, spirits), and responses to price changes (206). In addition, multiple factors influence pricing which have made this strategy an effective but not completely sufficient means of managing total alcohol consumption and alcohol-related harm. What has been clear from some investigations was changes in total costs tended to have a consumer-type effect. That is, the demand of heavier drinkers was more sensitive to advertising and less so to price compared to moderate drinkers (207). From an alcohol policy and harm strategy perspective, these instruments have some net effect in reducing alcohol use and related problems, but appear to work best when tailored for a selective consumer group. Nonetheless, more comprehensive public health responses have warranted to ensure broader coverage and inclusion of all at risk drinkers in designing interventions to reduce the overall burden of alcohol harm.

2.3.2 Alcohol Advertising and Promotion

Recent studies have demonstrated that in Australia between 1997 and 2011, the alcohol industry invested $3.4 billion in conventional and web-based advertisement, with retailers being the primary advertisers in this regard (208). Until recently, the alcohol industry and its marketing influences have been an understudied but nonetheless very central aspect of the context by which drinking patterns are learned and practised (209). Some research has been directed towards the impact of marketing on certain subgroups such as youth and how attitudes and beliefs may be shaped by marketing campaigns that target behavioural

intentions to consume alcohol. For example, production strategies to enhance palatability (alcopops) particularly amongst younger consumers in New Zealand were shown to raise profits and stimulate controversy around links to increased consumption (210). The industry has capitalised on limited government regulation of advertising and direct promotion of products through the branding of sporting events and sponsoring of cultural programs (211) and through social media (212, 213). Numerous studies have shown mixed results regarding the impact of advertising on total population consumption. However, more comprehensive reviews of econometric studies suggested a lack of disaggregation within study samples masked effects of marketing-sensitive subgroups at the level of age and gender (214). These effects were in fact indicative of clear associations between behaviour and advertising, most notable in younger populations. Regulating alcohol advertisement and marketing was believed to have an impact on product exposure, whereby normalisation of drinking would be retarded and decrease the induction of new drinkers. Recent work supported this hypothesis and demonstrated that a 28% reduction in alcohol advertising on the market level would reduce binge drinking and monthly alcohol consumption considerably (215). Studies that have delineated the link between persuasive media messages and youths' decision-making suggested affective as well as logical processes impact initial drinking behaviour (172, 216). That is, interpretation of alcohol media messages was as important as exposure, and subsequent behavioural outcomes were contingent upon logic-based as well as emotional internalisation of those messages. Thus purely logic-based campaigns to decrease alcohol consumption may fail to achieve objectives when countered by media messages that use an affect-oriented appeal to enhance young drinkers' perceptions about the positive aspects of alcohol use.

2.3.3 Education and Persuasion

It has been hypothesised that offering health information would increase knowledge and change attitudes of the consuming population and spontaneously prevent drinking consequences. This has been attempted through education and persuasion via information to the general population using mass media and school-based programs (205). These public service announcements (PSAs) usually dealt with issues such as drink-driving hazards or responsible drinking, but depended largely on donated time or space for public dispersion. Counter-advertising responses disseminated information about alcohol products in an effort to reduce appeal and discourage use. Some studies have shown high public acceptance of educational campaigns. While there has been exponential growth in the amount of informational and educational campaigns, there have been few evaluative efforts. In the cases where evaluations were conducted, methodological soundness was lacking and there did not appear to be lasting effects on consumption levels and related problems (205). For the reasons stated in the previous section, the high-quality cognitive and affective investments incorporated into paid pro-alcohol advertisements present an almost unsurmountable challenge for smaller budget public sector prevention and intervention efforts.

2.3.4 Drinking Venues and Availability

An established contention suggests concentrated alcohol availability/outlet density has a significant relationship with consumption and alcohol-related problems (217). A substantial amount of research has underscored the association between frequency of licensed venues in a geographic location and the total level of violence and crime in that area (218). In fact, one Australian investigation indicated nearly half of all non-domestic violence assaults and more than half of alcohol-involved assaults took place in or near a licensed venue (219). Studies have shown that not only is there a significant increased level of intoxication after midnight (220), but also an increased likelihood of injury when consumption occurred in a licensed premise (pub or club) as compared with off-license outlets (i.e. bottle stores) (65). It has been

shown that levels of alcohol-related crime are heavily influenced by drinking venue trading hours (221). As such, the recent liquor licence reforms in NSW that included lockouts and last drinks measures have had some effect in the Sydney CBD Entertainment precincts. For example, after controlling for any potential geographical displacement, time series analyses suggested the January 2014 reforms had an immediate and substantial impact on the number of alcohol-related assaults in the Kings Cross and Sydney CBD (222). Notwithstanding, there were other reform components in place beyond commercial venue restrictions to limit alcohol availability. While some strategies to reduce consumption have specifically focused on licensed venues and trading hours, many have not had this level of impact on assaults and alcohol-related ED visits. Thus there remains a need to explore alternative responses in other societal sectors such as health care (223).

In the U.S. it has been shown that targeted marketing and outlet density in racial/ethnic minority communities has been a stronger predictor of homicide and interpersonal violence above and beyond race/ethnicity (224-226). The work by Herd (2011) in particular used a social constructivist perspective to examine alcohol-related problems within the context of outlet density and availability. The aggressive alcohol marketing campaigns targeting African Americans between the 1970-1990s, resulting in an overconcentration of alcohol outlets in poor, inner-city, ethnic-minority communities were given particular attention. Of note was the perspective held by non-Blacks that suggested Black culture was the source of alcohol-related problems. In comparison, Blacks favoured explanations that accounted for influences external to culture, including poverty, blocked opportunity and targeted marketing associated with increased availability and oversaturation of alcohol outlets (226). In some cases commercial drinking establishments and outlets existed to the exclusion of other retail amenities. These latter explanations were identified as the most common reasons for community activists to mobilise campaigns for better alcohol policy.

Commercial drinking establishments out of all venues have been the most intuitive context for intervening in alcohol-related problems because of the common practice of state regulation. For example, regulation of physical availability by restricting age, time, place of sales, density of alcohol outlets and promotions in licensed premises was thought to increase the individual effort of acquiring alcohol and thereby reduce overall volume consumed and associated problems, especially for younger drinkers (227). However, many other venue factors have a moderating role on the effect of alcohol as a contributor to social problems. These factors have included aspects of the drinking environment such as rowdy crowd behaviour, hostile music, aggressive bar staff who lacked training or ability to manage problem behaviour effectively etc. (228, 229). Therefore, effective regulation entails a broad response that accounts for history, culture, and key stakeholders in recognising drinking as a 'time-out' activity with financial and other incentives for operators and the night-time economy in general (205).

2.3.5 Drink Driving Measures

Alcohol is a major risk factor for vehicle-related morbidity and mortality. While road traffic injuries accounted for less than 3% of all global mortality, they have been the leading cause of death for persons 15-29 years of age. In Australia up to one third of road traffic injuries have involved alcohol (230, 231). Drink driving laws introduced countermeasures that behaviourally were thought to be an ideal deterrent, creating social pressure and fear of punishment in order to reduce drink-driving practices (232). The policies mandating such laws have outlined the legal and regulatory mechanisms as well as rules and procedures for implementation (205). These mechanisms and procedures rely heavily on individual perceptions of severity and susceptibility. That is, a potential drink driver is likely to weigh the odds of being caught in an alcohol infraction and if caught, how harsh will the penalty be and what are the possibilities for evading such. Therefore, some research has suggested that

policies which increase likelihood of detention and arrest (susceptibility) may have greater effect on reducing drink driving practices and subsequent morbidity/mortality than policies with harsher penalties (severity) (233, 234). Reducing legal blood alcohol limits or changing penalty types, may not therefore be as effective a deterrent as increasing certainty of detection through measures such as random breath testing, although this also has been questioned (235). Thus if threat of being detected for drink driving as a deterrent has been outweighed by favourable attitudes towards drink driving, then offending behaviour is highly likely. Identification and referral of impaired drivers in the ED was considered a worthwhile effort, but was challenged by the idea of whether mandatory inpatient detox could have an effect on recidivism and ED use (236, 237). In short, social and physical environments that do not suppress drink-driving behaviours have been significant contributors to alcohol-related problems and have required additional response strategies to overcome this challenge.

2.3.6 Primary Care Interventions

Clinical treatment has only recently been widely considered a legislative or preventive response to alcohol-related problems within the policy domain per se. Yet, governmental action in the form of treatment policy affects the nature of services and provision of resources. This area has received more scrutiny however, in terms of intervention effectiveness and program evaluations designed to manage alcohol-related problems. From a public health policy perspective, treatment services have been part of a comprehensive approach and have been classed as forms of secondary and tertiary prevention when implemented shortly after onset of an alcohol problem or as a means of damage control, respectively (205). Within the general practitioner (GP) and primary care environments, a range of treatments exists for alcohol-related problems including opportunistic and brief interventions. Opportunistic and brief intervention programs have been regarded as efficacious forms of early interventions and have been the focus of much implementation

research in the last few decades (238, 239). Because of the low-intensity and short duration of opportunistic and brief interventions, they have been particularly well indicated for moderating behaviours of non-dependent high-risk drinkers. Unfortunately, universal adoption amongst GPs has not been common despite recommendations for routine SBI amongst certain populations such as pregnant women (156, 240, 241). Within women's health settings patient attitudes towards receipt of SBIRT services have been highly favourable. In one study 93% of patients agreed or strongly agreed that 'if their health was being affected by their drinking, their health provider should advise them to reduce consumption' (137). Less than 20% reported their clinician actually offered this advice in spite of the fact that 44% of the study sample was at risk for alcohol-exposed pregnancy.

International studies on GP management of alcohol-related problems found that while training may have increased reported intervention rates, it did so only for practitioners who previously held adequate role security and commitment to working with drinkers (160). It was concluded that GP attitudes which were unimproved or worsened during training, may be amenable to enhanced practice exposure as well as training and education that accounts for affective characteristics of health professionals. That is, the emotional responses of providers would need to be strongly considered in staff interventions designed to address alcohol problem management. Thus, in spite of the evidence for benefit with brief interventions in a variety of settings, difficulties remain in persuading practitioners to implement such care (205).

The above mentioned social strategies and policy responses for the most part have targeted the individual drinker and were less focused on health providers. While these responses may have proven necessary as a means for reducing the overall harm related to alcohol consumption, in isolation each has been insufficient in resolving the problem. Ideally such strategies and responses work well when integrated as part of a comprehensive public

health approach that addresses the continuum of alcohol-related problems. Some responses have been specific in their focus but not always sensitive to the state of the individual drinker who may not be dependent, but drinks variably at levels that have been harmful to themselves or others. These individuals frequently require emergency care where the focus (traditionally) may be more medically acute as opposed to secondary prevention. However, the substantial demands placed on ED staff in this regard may indicate a preference for brief and/or opportunistic interventions rather than intensive and long-term treatment. Therefore, understanding current health provider responses to alcohol-related problems and the mechanisms driving those responses have been key to developing a sufficient and comprehensive public health approach in managing alcohol-related harm.

2.4 Health Professional Response

As described previously, treatment responses to alcohol-related problems in general have vacillated between community-based support such as Alcoholics Anonymous (AA) to medical interventions such as inpatient detoxification and residential care. In terms of medical responses, communication between health providers and their patients about alcohol use has been limited. According to a U.S. study, the prevalence of having had a conversation about alcohol use with medical staff within the 'last year' was 7.6% among adults 18 years or older (242). While 'ever having' this communication was more common among 18-24 year olds (27.9%), the prevalence among binge drinkers was 25.4%, and overall only one in six U.S. adults reported ever discussing their alcohol use with a doctor or another health professional. An Australian study of ED nurses who reported on current practices in the previous week stated they asked on average one in four patients about alcohol use (243). In another sample of ED doctors and nurses, self-reports of current practice suggested doctors were twice as likely as nurses to query patient alcohol use, but both professions were highly unlikely to employ a standard screening tool to assess patient alcohol consumption in routine

practice (58). Once the occasion of service changes from a casual visit to an acute incident, the likelihood of having such conversation often decreases. For instance, accidents and injuries generally fall in the domain of the ED where the first line response has been to focus more on the medical aspects of injury/trauma and less so on alcohol consumption in and of itself (161, 244). Quite often medical injuries and alcohol-related behaviours were seen as separate issues in a given presentation. In fact, treatment and prevention activities had been traditionally unconnected in their design, implementation and evaluation (205). Thus, the likelihood of a provider engaging a conversation about alcohol-related behaviours let alone SBI has been significantly minimised in the context of an acute incident such as injury. This has generated a number of hypotheses as to why an inadequate response continues to exist despite the evidence for effective treatment.

Shaw et al., (1978) outlined three theories that have elaborated on ideas about improving the provider response to alcohol-related problems. While some theories may have been speculative and untested, they require closer consideration in terms of relevance to current attitudes and beliefs. The first theory described an inadequate response due to the 'clinician's unawareness of the facts about alcohol and 'alcohol abuse' and posited that if they became more aware, they would become more committed'. The second theory suggested 'culpability lay within the moralistic attitudes clinicians held towards drinkers, which inferred a sense of weakness and undeservingness, and was best addressed by helping clinicians to accept that drinkers were ill and needed help'. A third line of reasoning, similar to the first theory, was to identify efficacious treatments and then the response would improve naturally' (188).

Going back over these three theory bases, it was clear in the first instance from experimental studies that education alone did not improve clinician capacity to be more therapeutically committed beyond an increase in information. For example, D'Onofrio et. al,

conducted and SBI training with two groups of emergency medicine residents at two different program sites. Compared to the control group over a 1-year period, residents in the experimental group retained improved knowledge and skills practice at significant levels. The improvement was measured by review of ED records and SBI documentation. However, consistent with the theoretical proposition, the increase in knowledge did not correlate strongly with an improvement in most attitudes and beliefs. The authors suggested that amongst the potential predictors of the findings was a sense of inadequacy on the part of the clinician to accurately assess their own skills in addressing alcohol-related problems in patients (245). This may in part explain why attitudes before and after information-only training did not change and would require a more substantial intervention over a longer course of time.

The second idea encapsulates the disease conceptualisation of alcohol problems, which has been assumed to counter-balance 'over-moralistic clinical attitudes' that posited drinkers were weak-willed and can only blame themselves. This disease model posits that the drinker is powerless to control themselves, and since they have a 'disease' as an 'alcoholic,' others (clinicians) would/should be more sympathetic to them and willing to help. This idea was unpacked by Robinson (1972) who pointed out that it is possible to hold both views, namely that 'alcoholics' have a defect in character, and also that this defect is a blameworthy trait. While it was possible for a clinician to accept this premise of an incurable defect, it was also likely for the clinician to conclude that treating it would be futile (246, 247). In short, acceptance of the disease model did not necessarily ensure a positive attitude towards drinkers and an improved response to the problem. Holding such blameworthy attitudes towards the drinker was likely to safeguard the clinician's sense of confidence in the workplace against failed outcomes. Furthermore, this conceptualisation of the problem may

have contributed significantly to the pedagogical framework that has guided medical training in the last few decades (181, 184, 200).

In the final theoretical approach, it was presumed that by discovering the most effective treatment, an improved response to alcohol-related problems would ensue. This approach has been undermined by evidence that showed no one program type was any more effective than another (248, 249). This is not to say that treatment doesn't work. In fact, an influential review of 361 clinical trials and treatment modalities since the 1950s for alcohol use, have shown brief interventions were equally effective as social skills training, behaviour modification and others (250). However, brief interventions lead the list based upon cumulative evidence scores of high quality study methodologies and a high percentage of positive findings. In general, treatment effectiveness measured in long term outcomes varied little via method, beyond effect of formal vs. informal modality (250). In other words, variations in the treatment method do not produce greater outcomes-nor do differences in treatment philosophies explain the lack of benefit for some clients (160). Shaw et al., (1978) argue that 'therapeutic commitment' was a better explainer of positive patient outcomes. Patients treated by clinicians with high therapeutic commitment, that is a clinician who felt optimistic about the engagement and felt positive about the contribution they made in helping the patient, had consistently achieve improved outcomes.

It is evident from this theoretical elaboration that several models identify nuances of the importance of health professionals' response to alcohol-related problems and ARI. While it has been reported that "some clinicians would rather give up their post than to deal with drinkers" (185), the other end of the continuum identified "therapeutic commitment" as an important response variable leading to beneficial outcomes (251, 252). Of note is work looking at aspects of clinician attitude that account for the therapeutic alliance, compassion and/or empathy components of treatment (253). It has been suggested that the counsellor or

clinician who provides a treatment intervention regardless of theoretical orientation, is the largest determinant of client outcomes and that between 5% and 12% of the variance in outcomes was due to therapist difference (254). Empathy has been proposed as a particularly important and reliable predictor of treatment success in alcohol use and thus proposed as a key therapeutic skill to be screened for and taught as part of an EBP response (253).

Some efforts have attempted to address the "response" issue through training, education and attitude adjustment etc. (255-260). These endeavours have been met with mixed results (261). Nevertheless, an effective approach to building a practical response must be informed by robust evidence. International guidance recommends research priority be given to understanding attitudes and decision-making connected to provider views on the nature of alcohol-related problems and treatment (262). Systematic reviews have shown that attitudes and beliefs towards alcohol-related problems vary significantly amongst ED clinicians which may account for marked variations in use of SBIRT models (193). Until recently, little research has built upon this platform from a theoretical perspective in Australia. Hence a review of the literature on the current evidence base for responding to alcohol-related problems is warranted prior to a closer examination of the Australian ED response.

2.5 Screening and Brief Interventions: Evidence-Based Responses

2.5.1 Alcohol-related problems and Evidence-Based Practice

There are well noted challenges to implementation of evidence-based practice (EBP) when responding to alcohol-related problems (42, 263-270). The term "evidence-based" first made its appearance around 1990 and has since become the nomenclature for identifying those protocols, procedures, strategies, etc. that have an adequate research base to support their use (269, 271). In the AOD field, migration towards EBP has mirrored a similar movement in the medical field to improve treatment and service organisation by

incorporating ‘evidence into practice’. While there is sufficient evidence and widespread recommendation to implement EBPs, it has been noted that they are commonly underutilised in general health practice and substance use treatment (272). Obstacles including lack of knowledge about existing practices, time, organisational and systemic issues, as well as staff resistance have been noted as reasons for the general underutilisation of EBPs (266). Beliefs affected by myths or pessimism regarding method efficacy, as well as resistance based upon attitudes, peer influences and lack of confidence constitute a large part of the reluctance to change and adopt a new practice (273). To overcome these issues, some governments have strongly encouraged and even mandated adoption and utilisation of EBPs (238, 274). The next section will examine the evidence-base of SBI as an effective response to alcohol-related injury. A later section (3.2) will explore obstacles to the adoption of EBP from the clinician and organisational perspective.

2.5.2 SBI as an Evidence-Based Response

As early as 1980, a global call was made for an efficient means of identifying and addressing the harms associated with alcohol consumption (275). It was becoming clear that some alcohol-related behaviours were linked to both acute and chronic health problems. As more reliable and accurate measures were developed for alcohol screening (113, 276, 277), hundreds of clinical trials were conducted to evaluate the efficacy of brief interventions in primary care, EDs and trauma centres (114, 120, 125, 278, 279). The aim of screening and brief intervention (SBI) has been to moderate alcohol intake, reduce or eliminate risk factors associated with consumption and offer opportunities to find and connect with additional services. The goal was to fill the gap between primary prevention efforts and more intensive treatment (52).

From a public health perspective, SBI(RT) has been identified as an effective mechanism for dealing with the global burden of disease for alcohol-related harms and injury

(15, 52). Calls have been made for widespread adoption and implementation of SBI across the healthcare sector (238). However, distinctions have been made between the clinical and research aspects of these claims as well as public health justifications for general screening and brief intervention. For example, some advocates question whether a population-level reduction in alcohol-related harm can be achieved using SBI (280). Using a mathematical modelling exercise, it was hypothesised, that 96% of the general public could be screened over a decade if all GPs in England would screen each patient in their next contact. In doing so, a population-level effect of SBI would be realised assuming a 10% success rate. A similar projection analysis was conducted in the US and had comparable outcome indicators that suggested if every eligible injured person in the country received BI, there would be an annual $1.82 billion savings from health care costs alone (281). The authors caution however, that this may only be an indirect effect without the supplementation of effective alcohol control measures.

In other respects, SBI has been demonstrated to have a major economic impact on morbidity and mortality. For example, in a prospective RCT, post SBI implementation, 48% fewer re-injuries were observed at 18 month follow up and a 50% reduction in re-hospitalisation was achieved (102). A subsequent review was conducted on trauma patients in terms of direct injury-related medical expenses using a cost-benefits analysis. Based upon those injured patients who would be candidates for SBI (27% of injured patients treated in the ED), it was determined that for every $1 spent on intervention, there was a $3.81 savings in direct medical costs (281). This translated into health care cost savings of up to $1.5 billion per year. These savings would be much greater if other societal costs such as mental health services, crime, lost productivity and reduced quality of life were also accounted for. Fleming et al., 2002 reported in an RCT (Project TREAT; Trial for Early Alcohol Treatment) that when SBI was implemented in 64 primary care clinics for non-dependent alcohol use, there

was a projected savings in healthcare costs at $4.30 for each $1 spent on intervention after 4-year follow up (282). This evidence base underscores the importance of initiating care before problems progress to more severe stages, necessitating more expensive treatment and service utilisation.

2.5.3 SBI Effectiveness in General Medical Settings

Research efforts have attempted to determine how effective SBI is in general, and how feasible is it for use in an acute care or emergency room context. An accumulation of positive evidence followed by much implementation research has resulted in a strong efficacy base for SBI (52, 283-285). Arguably the majority of SBI research has been conducted in non-emergency settings (i.e. GPs, outpatient, etc.), and the strongest evidence base supporting brief alcohol intervention lies within primary care (238, 286-288). In a recent review, reasons for mixed evidence in support of SBI included variations in medical settings, (i.e. in-patient, trauma centres, and EDs) as well as heterogeneity in target populations and delivery of the interventions (289). While it has been inferred that there are unique differences between trauma centres, emergency departments and hospital care settings, not all studies have achieved the level of sophistication required to fully understand effectiveness across these service settings. Similarly, the need for more complex designs that account for patient and provider moderators has been evident. This is not to discount past achievements in the research, which have stimulated current gains and elucidated the need for more complexity. In fact, these gains have increased awareness of the non-specific effects SBI has on varied health-related outcomes. For example, in a large multi-site trial that collected data on almost half-million patients, SBIRT implementation for combined illicit drug and alcohol use showed significant improvements in a diverse population (290). Furthermore, secondary analysis of the data demonstrated gains across other self-reported mental health and social

measures; which reflects the potential for SBI to impact distal health and social outcomes in addition to shifting substance use.

In another study based in the primary health-care settings of four countries, an RCT was conducted on the effectiveness of brief intervention for illicit drugs (291). Out of a total of 731 participants, 3-month follow-up scores suggested an overall decrease in drug use and related risks, indicating brief intervention was effective in encouraging use reduction. However, it was noted that 'regression towards the means' (decreasing treatment effects with greater follow-up time) is an inherent bias in this type of study. In addition, study procedures were standardised using research staff to conduct the SBIRT, making it unclear whether similar effects were achievable with usual clinical staff. Notwithstanding such limitations, this study provided compelling evidence that it was feasible to use a comprehensive public health approach to dealing with drug use in general and alcohol use specifically across settings.

A prospective study evaluating the relationship between alcohol screening scores and subsequent postoperative healthcare amongst 5,000 patients demonstrated a significant relationship between high-risk drinkers and; longer hospital stays, more ICU days, and twice the likelihood of returning to the operating room compared with low-risk drinker (292). These findings were consistent with previous reports of increased postoperative healthcare use for patients who were heavy drinkers pre-surgery (293, 294). These investigations frequently concluded that routine implementation of SBI preoperatively can deter extended hospital service utilisation. In this regard, alcohol SBI has been identified as a valuable clinical preventive service to be offered in healthcare practice (295). Furthermore, while there is a substantial accumulation of positive SBI efficacy research, there remains a need to elucidate specific moderators of outcome efficacy such as patient and provider behaviour. This will facilitate decision-making around which interventions are most effective in specific

settings such as the ED, and how potential beneficiaries will respond when the foremost presenting concerns are secondary to alcohol consumption.

2.5.4 SBI Feasibility in the ED

There has been a burgeoning body of SBI research in health and social settings with promising findings more recently in emergency care. As an evidence-based response to the problem of alcohol-related injury, SBI has been trialled and tested in several capacities within the ED. International reviews of the evidence have provided varying degrees of SBI cost-effectiveness in terms of health care utilisation, and a number of positive patient-measured outcomes (i.e. reduced drinking or decrease in alcohol-related consequences). For example, a combined systematic review and meta-analysis was conducted of 11 databases over a 10-year period to assess the methodological adequacy of published evaluations of ED-based alcohol interventions (125). The search terms for 'brief intervention' in the systematic review were broad however, and after excluding studies that evaluated feasibility of implementation, a relatively small sample of 13 studies evaluating effectiveness were retained for the review. The systematic review suggested a lack of outcome cohesiveness across methodological approaches and poor reporting of effect size. Despite these limitations, the review concluded that the rigour of intervention methodology was generally high with the majority of the studies reviewed being RCTs. Using only results from the 10 RCTs of the review, the meta-analysis showed a positive association between ED-based interventions and a reduction in alcohol-related injuries in the 6 or 12 months following the ED visit. However, there was not a significant finding for the effect of intervention on frequency of heavy drinking at 6- or 12-month follow up (125). This was consistent with the injury prevention literature cited in chapter 1 which demonstrated frequency of consumption was not a consistent primary mechanism by which interventions reduced alcohol-related injuries (101).

Another review of 14 studies on brief interventions identified a general effect of reduced alcohol consumption, hazardous alcohol use, as well as alcohol-related injuries compared to ED treatment as usual (131). However, a third of those studies found no effect of BI on the targeted outcomes while the studies with some effect found significance in either consumption reduction or decreased negative consequences (i.e. injury frequency), but not both. In this and other studies, there was a reported positive effect in the control groups as well (i.e. a reduction in consumption or alcohol-related problems) with statistical differences between experimental and controls inconsistently reported (296). Hypotheses for this observation usually centred around the idea of the medical event itself being a teachable moment, and a window of opportunity to motivate behavioural change (297). That being said, many injury patients presenting to the ED were not seeking treatment for alcohol per se, but incidents secondary to alcohol-related problems, which has had important implications for the interpretation of study results. As noted below, these mixed results have been associated with: variability in study designs; lack of explicit, standardised definitions of brief interventions; and, clinical trial heterogeneity that complicates the ability to draw definitive conclusions across settings (298). Notwithstanding this inconclusiveness, the overall evidence has suggested a "positive trend with regard to the use of brief interventions in emergency settings to reduce substance use…at least in the short term particularly for people with alcohol problems" (299).

Making a clear distinction between treatment seeking and non-treatment seeking has been a critical component in the evaluation of ED study findings (42, 300). Hansen et al., (2012) conducted an RCT testing SBI implementation with newly trained workers. One goal was to determine if there was a reduction in alcohol consumption between treatment vs. non-treatment seeking heavy drinkers. A fidelity instrument (Motivational Interviewing Treatment Integrity -MITI 3.0) was used to control for quality of intervention delivery, and initial results

suggested no statistically significant difference between brief motivational interviewing and simple information on most outcomes. Both groups did however experience a reduction in overall alcohol consumption, suggestive of clinical significance. That is, while statistically, the numerical outcomes (mean *difference* between groups did not reach significance), there was a clinically important outcome (decreased alcohol consumption in *both* groups). From a provider perspective, the MITI analysis demonstrated less than optimal delivery of BMI quality by the clinicians. The authors identified several limitations, including lack of a pure control group, less than ideal conditions of intervention delivery and unique attributes of the study sample that reduced generalizability to other populations (301). However, as noted in Moyers et al., 2002, and related studies, these outcomes potentially confirm the notion that brief interventions have had a considerable potential to reach those individuals who would not otherwise seek formal help for alcohol-related problems while in the ED. This is significant because some of the negative provider responses to implementation have been based on the view that the ED was not an appropriate setting for intervening with problem drinkers (63, 138). Subsequently, the opportunity to effectively engage those patients who did not intend to discuss their alcohol consumption in relation to injury was lost. Hence, the importance of opportunistic interventions, one form of a brief intervention deemed appropriate for the ED, since they have been designed to target those not formally seeking treatment for alcohol-related problems, but who are at substantial risk.

It has been argued that patient readiness or intent to treat for alcohol problems can be a significant moderator in the modality and effectiveness of ED delivered SBI (302, 303). In addition, who delivers the intervention in this capacity has also been critical to specified outcomes. For example, Longabaugh and colleagues (1995) observed differences in treatment outcomes for ED patients with varied levels of readiness to change. However, such patient characteristics were not considered exclusive moderators of the brief intervention (116). A

later study supplemented these findings based upon patient attribution of their sustained injury to alcohol which was found to moderate intervention effects in an acute setting (304). In an inpatient hospital study, readiness to change alcohol use did not appear to moderate the effects of BI. However, this sample included patients who had very heavy/dependent use for which BI has been shown to be less effective (132). Elsewhere, readiness to change was a mediating factor of treatment effects on alcohol-related consequences for patients with a high level of pre-intervention motivation (303). In all these studies, outcomes were not always synonymous. It has been noted that distinctions between various settings and the impact they have on patient attributes have not always been clearly elucidated in some studies (289, 305). In a relevant review, these differences were noted but determined to be of minimal concern with regards to the feasibility of opportunistic brief interventions across settings (306). Opportunistic interventions are provided to patients who are not necessarily seeking treatment, but are identified as at-risk drinkers. While the practicality of implementation is questionable, opportunistic BIs have the potential for use across settings, particularly in the ED where injury treatment was the primary concern, but readiness to change may be relatively high (47).

In an RCT where the objective of the study was to train ED staff in SBI in a "real-world" context, opportunistic SBI was provided either same day in the ED, or offsite in the form of motivational interviewing. In evaluating the feasibility and efficacy of opportunistic SBI in the ED, it was noted that brief intervention or motivational interviewing were no better than standard care (counselling) in reducing self-reported 'high-risk alcohol consumption' at 3 months post-intervention (47). In that particular study, a screening instrument (PAT test) not commonly used in the majority of the literature was employed and follow-up rates were reportedly low. Also, injured patients were less likely to be screened and this study involved over 150 different staff providing screening and more than three dozen offering interventions,

limiting the fidelity of how the brief intervention was delivered and measured. Lessons learned from this study included the need to utilise reliable and valid screening measures, and maintain quality control over fidelity of intervention.

In a Cochrane review of interventions to prevent injuries in 'problem drinkers', 23 trials comparing intervention to no intervention reported reduced injury-related outcomes in the following categories: motor vehicle crashes; suicide attempts; falls; domestic violence; and, other alcohol-related injury emergency visits. The reductions across incidents ranged from 23-65% (101). In a review of the literature however, Saitz (2010) noted that such effects may be generalisable only to non-dependent drinkers. In fact, more research has begun to focus on generalisability of findings and have discovered that SBI has proven efficacy in short-term studies (307). However, longitudinal investigations have determined that more of the burden of disease resulting in alcohol-related injury was due to non-dependent drinkers (76, 308). To add, Kaner and others have demonstrated that most societal alcohol problems and costs are not due to those drinkers with severe alcohol dependence, but rather those who consume at sub-clinical but risky levels (42, 150). This has led to an emphasis for discrete types of SBI for non-treatment seeking at-risk (non-dependent) drinkers in the ED.

It is evident that the general lack of consistency among SBI studies in terms of effectiveness in ED and trauma settings limits the ability to make bold recommendations. Given the nonspecific effects of BI on various alcohol-related outcomes, there is uncertainty regarding appropriateness for the target population of injured patients. However, as noted by Bernstein (2008), 'it would be premature to dismiss SBI in the ED simply because scientifically sound studies have not agreed in their findings'. More research has attempted to reconcile these concerns by adjusting for specific moderators related to patient and provider characteristics as well as improvements in study designs specific for the ED (124, 309). For example, a systematic review of 39 studies reported a positive effect for ED-based BI in over

80% of cases and strongly recommended SBI for routine practice in the ED (123). However, caution was warranted based upon the small number of ED studies that had accumulated to that point limiting generalisability. Assumptions are often made for the generalisability of outcome effectiveness of brief interventions in health care among hazardous and harmful drinkers in other settings. Kaner et al., (2007) and Kraemer (2007) noted that the efficacy and feasibility of SBI was highly dependent on the setting in which it was delivered (i.e. primary care, ED and non-ED hospital), in which case there was a significant difference that limited generalisability. In the same vein, the impact of the clinician/provider on outcome measures has also been integral to the varied observations and is thus a primary focus of the current research project.

The most recent and perhaps comprehensive evidence for RCTs in the ED has been summarised in three studies over the last year (117-119). While alluding to the ambiguity of existing evidence associated with ASBI, small effects have been observed on outcomes such as overall consumption and alcohol-related consequences. As an example, in a systematic review of 34 studies, all of which reported a significant reduction in 3-month post BI consumption, between-group differences did not hold at 6- and 12-month follow up (117). In terms of subsequent injury post BI at 12-months, most of the high rigor investigations in the review did conclude BI efficacy in terms of a significantly lower risk of injury a year after treatment. The important point however is that small improvements in outcomes across a large population for modest investment is a potentially important public health outcome. Concluding remarks of the review lay emphasis on the need to control for intervention fidelity and therapist effects. Few studies included fidelity ratings, thus making it impossible to determine whether the recommended components of BIs were adhered to, which limits the generalisability of even modest results. As such, one plausible conclusion based upon

observed results could be that the effect produced by merely presenting to the ED with alcohol-related consequences stimulates change (117).

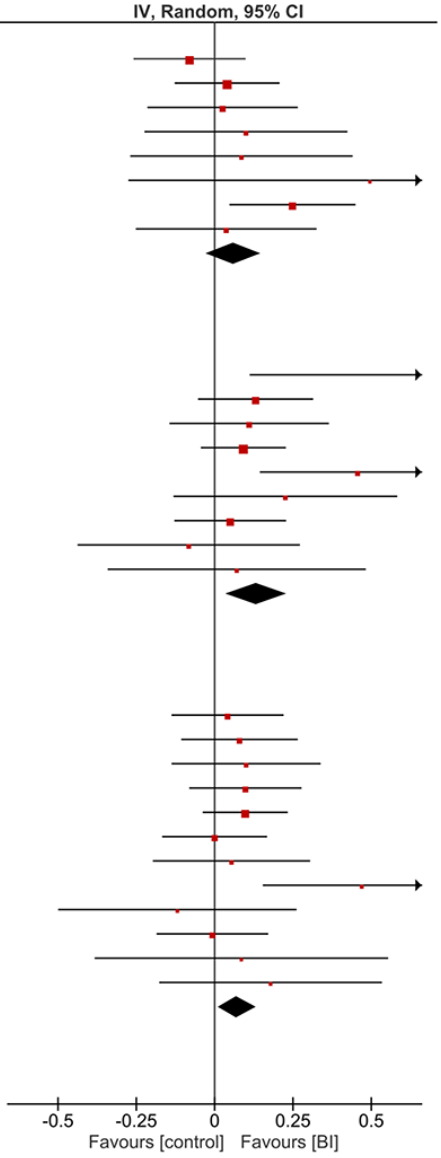
Given the current evolution of technology and need for time-sensitive interventions in acute care, brief interventions that incorporate such factors are an intuitive part of the process. Ultra-BIs are one such example, and include any direct interface conducted within 10 minutes or have an indirect technology-driven component. In a systematic review of ultra-BIs in the ED, outcome measures of concern were changes in frequency and quantity of alcohol use, HED and ED presentations measured across RCTs and quasi-RTs (118). Changes across the review studies were captured in an effect size statistic (where reported: Cohen's *d*) and out of 13 different studies, six reported significant reductions in alcohol consumption quantity and three showed reductions in HED. While, there were limited significant changes reported in the other outcomes, this review reiterated previous insights that small clinical effect sizes can potentially translate into substantial population effects across a large ED population whose alcohol characteristics tend to be disproportional to the general population.

Many of the studies discussed to this point have been included in the reviews mentioned above. Thus it has been pertinent to include an overview of the results as charted in the Schmidt et al, (2016) study for clarity (119). Within that systematic review and meta-analysis, 28 separate RCTs were included that tested the effects of BI on drinking in injured and/or intoxicated ED patients. Similar to the McGinnes review, changes in consumption quantity, frequency and HED were assessed at 3-, 6- and 12-month follow-ups. This culminated in nine separate random-effects meta-analyses of standardised mean differences (SMD) for the 33 related publications encompassing 14,465 patients. The investigators were able to control for statistical heterogeneity across studies, thus providing robust findings for moderators such as intervention type, study quality and implementation mode (I^2 below 40%). Of note was the lack of moderation effects, which suggests that there may be no clear

superiority of BI duration, form of interface (direct/indirect, face-to-face etc.) nor use of ED staff versus research staff in the ED setting. Because HED tends to be the factor most commonly implicated in injury susceptibility, and evidence suggests this is generally amenable to BI efficacy, the meta-analysis for that outcome is provided in figure 1. As noted in the chart, slightly higher reductions in HED were indicated for the BI condition at 6- and 12-month follow-up. While the summary effects provided are small, these results resonate with previously mentioned conclusions about the low cost and high impact of population level effects (118, 280).

Figure 1 Change score difference between BI and control group: number of HED (excerpt from Schmidt et. al, 2016)

Study or Subgroup	Std. Mean Difference	SE	Weight	Std. Mean Difference IV, Random, 95% CI
1.9.2 Follow-up: 3 months or less				
Blow 2006	-0.08	0.09	22.0%	-0.08 [-0.26, 0.10]
Maio 2005	0.0399	0.0842	24.8%	0.04 [-0.13, 0.20]
Mello 2008	0.0254	0.1212	12.6%	0.03 [-0.21, 0.26]
Segatto 2011	0.0999	0.164	7.0%	0.10 [-0.22, 0.42]
Spirito 2004	0.0855	0.1798	5.9%	0.09 [-0.27, 0.44]
Suffoletto 2012	0.4954	0.392	1.3%	0.50 [-0.27, 1.26]
Suffoletto 2014	0.2484	0.1014	17.6%	0.25 [0.05, 0.45]
Wang 2010	0.0369	0.1459	8.8%	0.04 [-0.25, 0.32]
Subtotal (95% CI)			**100.0%**	**0.06 [-0.03, 0.15]**
Heterogeneity: Tau² = 0.00; Chi² = 7.35, df = 7 (P = 0.39); I² = 5%				
Test for overall effect: Z = 1.38 (P = 0.17)				
1.9.4 Follow up: 4 to 6 months				
Apodaca 2007	0.8676	0.3844	1.6%	0.87 [0.11, 1.62]
D'Onofrio 2008	0.1308	0.0925	17.7%	0.13 [-0.05, 0.31]
D'Onofrio 2012	0.1102	0.1286	11.3%	0.11 [-0.14, 0.36]
Field 2009, 2010, 2010	0.0916	0.068	24.7%	0.09 [-0.04, 0.22]
Monti 2007	0.4562	0.1579	8.2%	0.46 [0.15, 0.77]
Shetty 2011	0.2257	0.1809	6.5%	0.23 [-0.13, 0.58]
Soderstrom 2007	0.0498	0.0897	18.4%	0.05 [-0.13, 0.23]
Spirito 2004	-0.0827	0.1798	6.6%	-0.08 [-0.44, 0.27]
Trinks 2010	0.0705	0.2089	5.0%	0.07 [-0.34, 0.48]
Subtotal (95% CI)			**100.0%**	**0.13 [0.03, 0.23]**
Heterogeneity: Tau² = 0.01; Chi² = 10.79, df = 8 (P = 0.21); I² = 26%				
Test for overall effect: Z = 2.64 (P = 0.008)				
1.9.5 Follow up: 12 months				
Blow 2006	0.0412	0.09	11.3%	0.04 [-0.14, 0.22]
D'Onofrio 2008	0.0794	0.0936	10.5%	0.08 [-0.10, 0.26]
D'Onofrio 2012	0.1004	0.1201	6.4%	0.10 [-0.13, 0.34]
Daeppen 2007	0.0982	0.0902	11.3%	0.10 [-0.08, 0.27]
Field 2009, 2010, 2010	0.0977	0.068	19.9%	0.10 [-0.04, 0.23]
Maio 2005	0	0.0842	13.0%	0.00 [-0.17, 0.17]
Mello 2012	0.0538	0.1268	5.7%	0.05 [-0.19, 0.30]
Monti 2007	0.4695	0.1599	3.6%	0.47 [0.16, 0.78]
Shetty 2011	-0.1189	0.1929	2.5%	-0.12 [-0.50, 0.26]
Soderstrom 2007	-0.0071	0.0897	11.4%	-0.01 [-0.18, 0.17]
Sommers 2006	0.0853	0.2377	1.6%	0.09 [-0.38, 0.55]
Spirito 2004	0.1785	0.1801	2.8%	0.18 [-0.17, 0.53]
Subtotal (95% CI)			**100.0%**	**0.07 [0.01, 0.13]**
Heterogeneity: Tau² = 0.00; Chi² = 9.45, df = 11 (P = 0.58); I² = 0%				
Test for overall effect: Z = 2.39 (P = 0.02)				



In summary, reasonable evidence exists to support the use of SBI with patients who screen positive for hazardous consumption (193, 238). There has also been recognition of the general efficacy of screening and brief alcohol interventions in the ED setting. This is in light of the very few studies that have controlled for or specifically investigated clinician and provider effects. The mixed evidence has pointed to the need for more sophisticated evaluations of SBI efficacy, feasibility and caution in claims about impact (289, 306) and caution in claims about impact.

It seems a substantial amount of the literature has identified methodological challenges within study designs especially in the ED (310). Innovative strategies have been trialled including use of mailed personalised feedback to reduce alcohol consumption among ED patients (283), as well as computerised technologies to enhance the effectiveness of screening (113, 311) and brief interventions (284, 312). To some extent, these strategies have still relied on a patient-provider interface, whether it involves the initial screening, or a brief intervention and treatment referral where indicated. The overall recommendation continues to be a need for improved methodological designs and acknowledgement of the practical issues inherent in the context of an acute medical setting and/or with the targeted population (77, 125, 126).

The ED has been recognised as the entry point into the healthcare system following a traumatic event or medical emergency. ED staff have been responsible for early detection and intervention and where required, referral for more definitive care of exacerbated acute and chronic conditions. However, it has been documented that ED clinicians have failed to detect alcohol-related problems, intervene, and refer when appropriate (236). Some reasons for this have included time constraints, unrelated diagnoses, difficulty with referrals, a recalcitrant population as well as provider attitudes and confidence. Furthermore, it may be that the likelihood of future alcohol-related injury has not been viewed as a public health problem

necessitating ED attention. However, when perceived as possibly the only chance for those patients to have a meaningful interface with a health professional that reflects on their alcohol-related injury and future risk, the importance of screening and intervening is compelling. Alcohol-related injury is a health problem requiring the same proactive response as liver disease, cardiovascular disease, gastrointestinal bleeding and other disorders directly related to alcohol consumption, and the lack of recognising of it as such, is inadequate. Nevertheless, ED staff are uniquely positioned to flip the switch of illumination for the proportion of society who are in the dark about such risk factors (236). This proportion has been readily identifiable and amenable to interventions that have a proven efficacy for reducing the huge societal burden associated with unaddressed alcohol-related problems and injury. Thus the final section of this chapter introduces an exploration of the issues associated with the lack of routine screening and intervention in Australian EDs.

2.6 Lack of a Routine and Standardised Response in the Australian ED

There has been a growing amount of Australian research on alcohol-related harms, patterns of use and epidemiological data associated with ED presentations (65-67, 74, 80, 88, 105, 313-316). This research has substantiated the need for more precise clinical approaches and responses to ARI in the ED. It has also corroborated the importance of ensuring the response is evidence-based. It has not always been clear to what extent evidence-based practices have been utilised. However, what is clear is that successful implementation of EBP requires consideration of provider attributes such as attitudes and beliefs. In light of this understanding, there has been an inadequate exploration of issues associated with the lack of routine screening and brief intervention for ARI in Australian EDs and the links to clinician behaviour.

Screening and brief interventions while often considered as combination interventions, have also been addressed separately in the clinical research literature. As such, WHO

collaborative studies and published work explored the concept of screening by querying the level of agreement between measured blood alcohol concentration and clinical judgement in rendering a diagnosis (15). For example, ICD-10 codes have been used to reflect BAC and the perceived level of intoxication (Y90 and Y91 codes respectively). The latter was intended to be used when BAC levels could not be formally assessed. However, across Australian EDs, it was identified that there were a variety of ways in which patients were (not) screened for alcohol use that may be related to injury. Furthermore, screening positive for an ARI does not guarantee a clear diagnostic picture of alcohol severity or dependence. As such, it is possible that a lack of concise definitions and standards of screening practices may reduce staff confidence in effective interventions, which may in turn be a contributing factor to the varied ED responses.

Following a determination of screening feasibility for alcohol consumption within an Australian trauma setting, a recent study recommended that screening be routinely implemented as part of standard practice (167). In this manner, identification of potential beneficiaries of brief intervention would be more likely. This study noted that routine screening was not common, but did not elaborate extensively on why that was so. The need was consistent with a systematic review a decade ago that concluded the high prevalence of alcohol in hospital settings warrants a reliable evidence-based response (88). Indig et al., (2009) compared methods of screening and detecting alcohol-related presentations and discovered a range of detection levels based upon varying alcohol-related definitions used throughout New South Wales. They also reported a low level of alcohol history taking as reflected in patient medical records, noting inconsistency in methods of detecting and documenting such presentations (75). This study did not focus on clinician behaviour per se, but evaluated methods of screening application associated with clinician practices.

Some research has focused on SBI practice and implementation within Australia, but on a limited scale. For instance, a study of SBI implementation was conducted in a rural general hospital and determined that while it was possible to establish an SBI service in that

capacity, there was minimal discussion of the clinician factors related to implementation. This study was not exclusive to the ED and involved recruitment of a dedicated project worker to conduct SBI (239). Another Australian ED-based efficacy study of SBI utilised mailed personalised feedback method for reducing consumption among alcohol-related presentations (283). This study did not specifically focus on staff behaviour, but included a statement about poor adoption of SBI practice into routine care being due to staff time constraints and lack of financial resources.

ED clinician confidence has been identified as one reason for lack of a standardised response and has been investigated in terms of its impact on service delivery. For example, in a study on ED clinician knowledge and confidence in managing mental health-related presentations, participants identified a perceived deficit in skills to effectively manage patient aggression and alcohol intoxication (264). Similarly, in a national sample of ED nurses and doctors, staff reported a lack of confidence and deficits in knowledge of appropriate intervention practices (317). This study also acknowledged a lack of research that guides implementation of EBP for clinicians working in Australian EDs. Some explorations have been conducted on ED staff attributes in relation to implementation of clinical guidelines, but these have not been specific to alcohol-related injury and SBI (318). However, the findings have relevance in terms of a focus on staff responses to ED presentations in general and staff attitudes towards mental illness and the impact this has on triage decision-making.

There have been a handful of Australian ED-specific studies exploring staff behavioural responses in relation to alcohol-related presentations. Indig et al., 2009 examined staff attitudes and beliefs associated with the management of alcohol-related problems in two inner city hospitals in Sydney, NSW. The results suggested over 85% of staff perceived low patient motivation to be a major difficulty in providing brief interventions. In addition, time management and lack of resources were identified as major barriers to implementation.

However, being a doctor and having confidence and a sense of responsibility towards intervening with patients presenting for alcohol-related problems was positively associated with good self-reported practice. Moreover, half of doctors and a third of nurses in the study endorsed a sense of clinical responsibility to provide alcohol screening, which was strongly predictive of staff intention to formally provide SBI with these patients (58). Although this study utilised several constructs noted in the research literature to have predictive value in measurement of behavioural intention, a guiding theoretical framework was not explicitly mentioned.

In an RCT evaluating the feasibility of routine SBI, investigators attempted to train ED staff over the course of normal duty to screen all patients for drinking and implement brief interventions on site (47). There was significant variation between staff screening rates with one clinician screening 700 patients and others none. Although there were no specific attempts to interpret the data in terms of clinician behavioural barriers to implementation, it was concluded that SBI as an additional task to the current staff workload likely contributed to a low compliance rate (47). Weiland et al., 2008 employed a qualitative analysis to evaluate ED staff attitudes towards SBI implementation and while they found staff to have a positive attitude and general acceptance of the approach to intervening, all interviewees identified lack of time as a primary barrier to routine practice. The majority of staff believed ED-based screening and intervention could be feasibly incorporated into standard practice. Concurrently, staff endorsed a number of barriers that ranged from knowledge about the value of screening, patient intoxication and staff motivation, to staff expertise and the impact on resources (319). However, similar to previously mentioned studies, the objective of this investigation was not entirely focused on provider responses to ARI nor was there a theoretical rationale for the study approach.

One Australian study did identify its main objective as the examination of ED nurses' behavioural response to screening and intervening for patient alcohol consumption based on a theoretical framework. Freeman et al., 2011 used the Theory of Planned Behaviour as a guiding framework to explore the underlying determinants of clinician behaviour and found that in a sample of 71 ED nurses, there was a high intervention rate within a period of one week. Social support and encouragement in the role to intervene in the form of co-worker and manager reinforcement was positively associated with an increased likelihood of performing SBI. This study did acknowledge a number of barriers that were hypothesised based on the theoretical framework. This provided a robust measure for drawing conclusions about the utility of the theory. For example, the investigators objectively measured screening and intervention rates and interpreted the small coefficients as an indication that certain theoretical constructs were not predictive of behaviour. However, the small sample limited this interpretation by reducing statistical power. A reasonable conclusion suggested that the intense ED work environment may have impeded staff ability to translate their intentions into actions. Recommendations for future research stemming from the study included investigation of barriers that impinge upon staff ability to actualise intentions, as well as exploring facilitators to developing an ED setting that overcomes these obstacles (243). Although this study addressed a number of contextual issues related to the lack of a routine response to alcohol-related presentations in Australian EDs, the staff sample was limited to nurses and there was not an emphasis on alcohol-related injury.

To summarise this section, the growth in Australian epidemiological and methodological studies for responding to alcohol-related injury as a major public health problem has been appreciable. That research has underscored the need for precise clinical responses that are evidence-based. What has been perhaps, less proportionate to this growth, is the routine implementation of responses which arise from well developed theory-based

studies, that provide a consistent, robust and testable evidence base for application of the response. Up to now, the evidence for such responses has been mixed, which makes it difficult to derive bold conclusions about the value and worth of SBI in all settings. Nonetheless, there has been some positive evidence for efficacy in the ED, where the costs of implementation were minimal, and where SBI might be the best option with people who don't regularly access services. In addition, there has been no evidence of harm in the implementation, so by not responding, missed opportunities risk an ethical compromise. In short, incorporating the current best evidence, in spite of its shortcomings, equates to best practice as the research evolves.

In conclusion, the lack of a routine response to ARI in the Australian ED has not been extensively researched in the empirical literature on clinician behaviour. According to related literature on evidence-based practice, formal SBI is not standard protocol/practice in Australia. While varying forms of SBI have been used in isolated instances through less formal means (166), it was not apparent from the review of the literature herein that a theoretical framework has always guided the extant research. International research has demonstrated some efficacy of SBI implementation as an evidence-based response to ARI in the ED amidst some shortcomings (15). Nonetheless, implementation may be feasible in the interim while the research catches up to the practice. Recently, there have been media and formal policy responses to alcohol-related harms in Australia that reflect a changing landscape associated with stronger control agendas on drink-driving, pricing, availability, venue restrictions and stiffer penalties for public intoxication and violence (320). Certainly these responses provide an assertive approach to addressing the problem at the individual consumer level. However, from a public health and healthcare perspective, there has been limited incorporation of evidence-based prevention in the form of a provider-focused response (261). Thus, certain questions remain unanswered such as 'why hasn't there been a

formal public health response in the ED?' In addition, it is imperative to understand what barriers have prevented and what facilitators might promote an effective Australian response to ARI and routine implementation of SBI.

Previous research is mixed in terms of the reasons why ED staff don't often intervene to address alcohol consumption. From a theoretical perspective, a few ideas were proposed that included a lack of awareness about the true mechanisms of alcohol use, moralistic attitudes that led towards apathy, and lack of knowledge about effective treatment processes. In short, these ideas underscored therapeutic commitment as a critical variable that was often missing in practice. Training that failed to address this aspect of the clinical encounter was also implicated as a reason for reduced intervention levels. Rates of screening between professions were identified to provide a contextual background for overall discrepancies in reported screening practice. Moreover, systematic reviews have demonstrated how attitudes and beliefs towards alcohol-related problems vary amongst ED clinicians which may account for varied SBIRT outcomes and poor intervention rates. Limited time, unrelated diagnoses, difficulty with referrals, along with patient non-compliance and provider confidence were additional reasons suggested for lack of routine responses. Finally, future alcohol-related injury has not been universally viewed as an ED public health problem, hence a sense of responsibility to legitimately intervene may not have been achieved.

More information is needed about the cognitive mechanisms underlying clinician behaviour to improve interventions that target healthcare professionals in the ED. The empirical literature suggests clinician attitude, social norms, confidence and a sense of responsibility to intervene are important predictors of whether an effective response can be provided. This does not necessarily imply negative emotions or blameworthy attitudes towards drinkers have been the cause of an inadequate response. Rather, it may be these attitudes and beliefs represent manifestations of the perceived threat that failed outcomes can

have on professional integrity to address the problem. Furthermore, in order to understand why treatment has not been routine, it has been helpful to investigate mediators and moderators of effectiveness. Such mediators and moderators include empathy, clinician-patient alliance and other therapist effects. The next chapter will explore such mechanisms in detail and build upon a theoretical rationale and empirical approach in order to adequately respond to those queries.

CHAPTER 3: THEORETICAL PERSPECTIVE ON CLINICIAN BEHAVIOUR

3.1 Overview of a Theoretical Approach to Exploring Clinician Behaviour

This chapter introduces a conceptual framework for examining the lack of a routine response to alcohol-related injury in Australian EDs. To improve the rate of routine responses to ARI, it is helpful to identify clinician and environmental characteristics that contribute to variation in observed rates. Thus, the thesis employed a behavioural intention model as a guiding framework to identify beliefs, social influences, confidence, perceived barriers and other factors that may be significant determinants of ED clinician responses to alcohol-related problems. The rationale that follows, builds on a theoretical discourse for exploring clinician behavioural intention to perform screening and brief interventions in response to alcohol-related injury.

This chapter begins with a review of the literature on clinical behaviour in relation to SBI as evidence-based practice (EBP). Next, some theoretical perspectives will be provided to examine how cognitive mechanisms may influence health professionals' behaviours, and how changes in these mechanisms can inform conclusions about intervention effectiveness. Lastly, a review of studies on ED clinician behaviour will inform directions for conceptually exploring the juncture between ARI and uptake of EBP as a public health response.

3.2 Evidence-Based Practice and Clinical Behaviour

Examining the attitudes and intentions of health care professionals in relation to whether and how they deliver interventions is not a new endeavour (321-323). Evidence has indicated that clinician attitudes towards those whom they provide care can have a profound impact on the quality of that care (324, 325). Empirical studies have consistently illustrated that clinicians who establish optimistic rapport with a patient engaged in risky drinking were proactive in their response to alcohol-related problems, and more likely to have achieved a favourable clinical outcome (188, 326, 327). It has been repeatedly observed that while

attitudes and beliefs vary in terms of how they impact behaviour, it was not uncommon to find that enquiring about alcohol consumption was perceived by some clinicians as too personal and intrusive (193, 200, 257). This perception was based in part on the belief that the ED visit was too brief for such sensitive matters and that patients may leave the encounter feeling guilty. Thus, affective as well as judgemental cognitions have been influential in how clinicians arrive at decisions to intervene or practice a particular methodology. Simultaneously, these factors may have been tempered by clinical beliefs on whether the need was strong enough and the evidence was sufficient to warrant a fuller response.

3.2.1 Origin and Definition of Evidence-Based Medicine and Practice

Delivering potentially uncomfortable or difficult information has been noted as a complex exchange, particularly when it involves behaviour change (326). This has discouraged clinical enquiry even when intervening was mandated as best practice. For example, in a survey across 21 hospital antenatal clinics, mandated smoking cessation intervention (SCI) practices were affected at both the early, and late phase of program implementation, by different factors. Organisational factors were more important during the early phase, but clinician characteristics such as self-efficacy and personal smoking status were significant at later SCI implementation phases (169, 328). When it came to the influence of the clinician's own smoking status, smokers endorsed a decreased sense of ability and willingness to deliver SCI and perceived themselves as less capable to counsel patients about smoking cessation compared to ex/non-smokers. While the study results suggested that there was no significant difference in the number of reported interventions smokers/non-smokers offered, there was little discussion on whether the fidelity and quality of implementation differed by groups. Such evidence illustrated, however, the complex manner in which contextual factors influenced practitioners' ability to deliver evidence-based interventions and treatment in clinical settings.

A burgeoning area of practice research has investigated clinician treatment delivery and adherence to evidence-based methods. This area of focus has been guided by the work of Archibald Cochrane, whose early life experiences and academic career emphasised the pursuit of medical practice that was consistent with empirical evidence. He is considered as one of the originators of evidence-based medicine, and was credited with the development of the Cochrane Collaboration, which is the collection and analysis of systematic reviews of research and in particular randomised control trials. His written work culminated in *Effectiveness and Efficiency: Random Reflections on Health Services,* which reflected his criticisms on the lack of scientific evidence to guide medical practice (329, 330). He advocated use of RCTs to demonstrate treatment efficacy, and expressed concern over appropriate clinician behaviour in treatment delivery. In expressing concerns over the absence of a legitimate and collated summary of all RCTs, Cochrane argued that such a valid collection would enhance clinicians' ability to achieve accurate conclusions about best practice.

Evidence-based practice (EBP) has been defined as 'an approach that has been scientifically tested and subjected to clinical judgement and determined to be appropriate for the treatment of a given individual, population, or problem area' (269). These practices are guided by an ethical duty to ensure non-maleficence and beneficence in providing interventions that have the best likelihood of efficacy for achieving treatment goals. Furthermore, Sackett et. al (1996), have identified evidence-based medicine as:

> The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research. By individual clinical expertise we mean the proficiency and judgment that individual clinicians acquire through clinical experience and clinical practice. . . (this includes) . . . effective and efficient diagnosis and in the more thoughtful identification and compassionate use of individual patients' predicaments, rights and preferences in making clinical decisions about their care. Good doctors use both individual clinical expertise and the best available evidence, and neither alone is enough. Without clinical expertise, practice risks becoming tyrannised by evidence, for even excellent external evidence may be inapplicable to or inappropriate for an individual patient (331).

Based upon this definition and the idea that clinical expertise must be a critical factor in what evidence to apply, important gaps have been highlighted between the evidence of clinical research and clinician behaviour related to best practice (332). Of note are studies that have identified several factors influencing clinician responses to alcohol consumption. These factors included attitudes and beliefs, the confidence of the clinician in discussing drinking behaviour, and whether they felt that they possessed adequate skills, and the responsibility to engage the patient (333, 334). Reinforcing factors included social/managerial expectations to respond, prior training and experience, as well as belief in the efficacy of a particular piece of evidence (257). For example, clinicians who were unaware of differences between drinking patterns and associated alcohol-related problems were more likely to have biased opinions regarding the positive evidence of brief interventions on subsequent drinking behaviour (200). This was particularly problematic when clinicians maintained a dichotomous view of alcohol users as either "alcoholic" or "moderate" drinkers and merely relied on their evaluation of a patient as being an "excessive drinker" to ask about consumption levels (136). As a result, many clinicians have not taken an opportunistic approach to screening across the spectrum of risky drinking patterns in the ED despite the evidence (193, 335). Thus, it has been common to observe minimal overlap between beneficial treatment evidence in the scientific literature and aspects of that evidence expertly employed in clinical practice.

3.2.2 Clinical Training and Alcohol-Based Education

Barriers to evidence-based alcohol education within medical/clinical training programs may have contributed to a lack of self-efficacy as well as poor role responsibility for responding to drinking problems. Self-efficacy is "the belief about one's ability to succeed in a specific situation or accomplish a task" (336) while role responsibility is the "belief that one has the right to address certain client issues" (188). Such barriers have been common in other settings such as dentistry, where clinicians (n=1802) who did not feel the responsibility to

screen, were less likely to report having had a sufficient amount of drug and alcohol education/training (337). These clinicians were also less likely to raise other drug use with patients, a characteristic that strongly correlated with increasing age. Medical students and house staff surveyed on knowledge, attitudes and perceived role responsibility related to patient alcohol use demonstrated a strong relationship between reported practices and confidence to respond to alcohol-related problems (338). In the latter study, it appeared that the further along clinicians were in their training, the more negative their attitudes became. For example, house officers were more likely than fourth year medical students to endorse statements such as "alcoholics" 'lack willpower' and 'tend to be unemployed'. Educational interventions have been proposed to mediate attitude and confidence in the hope that additional knowledge related to screening and brief intervention would enhance attitudinal responses and improve practice. D'Onofrio et. al, have noted that while there were improvements in charted practice, clinicians' reported 'perception' of their own practice had not changed after educational interventions (257). The investigators of that particular study suggested that while clinicians (residents) may not have accurately assessed their current clinical activities, there was a measurable change in actual practice without an associated change in attitudes and beliefs. In other words, modifying practice to meet training expectations may not necessarily instil a positive change in disposition towards patients. Though the short-term clinical outcomes may have improved, low treatment optimism and unchecked moralistic attitudes early in a clinician's career may be a significant moderator of subsequent practice. Thus, changes in attitudes towards persons with alcohol-related problems may require more extensive strategies over a significantly longer period of time.

In a survey of 598 US emergency physicians, personal and professional attitudes towards patients with alcohol problems were hypothesised to be two of many influences on the use of brief interventions (161). In fact, role responsibility and positive attitude were the

most important factors associated with brief intervention support. In addition to confirming relatively little time was devoted to alcohol education during medical school training, the study found that alcohol screening and brief interventions were not formally part of the core curriculum of emergency medicine (161). Although subsequent policy changes now require trauma centres in some countries to have mechanisms for identifying patients with alcohol problems, the gap remains between science, training and practice (339, 340).

As noted in the preceding chapter, there has been a clear evidence base and professional consensus for SBI in relation to alcohol-related problems. A recent review of the literature (341) sought to explore the challenges of integrating SBI as EBP into clinical settings. A global conceptual model of integration, the Consolidated Framework for Implementation Research (CFIR) was employed to identify several program strategies that successfully implemented and achieved high rates of SBI practice. In that model, 'clinician characteristics' were formulated as criteria within a domain to articulate the "value placed on preventing unhealthy alcohol use by clinicians". Another domain, 'process of implementation' articulated the "systems in place to encourage clinicians to perform SBI". Seventeen articles from eight global studies assessed over 2000 clinicians (127, 304 patients screened), and all studies attempted to address CFIR criteria for clinician knowledge and belief about intervention practice. Three studies addressed self-efficacy, but none were identified as dealing with clinician attitudes directly. It was unclear how clinician confidence was measured and whether a theoretical framework was used in the design of implementation programs. It was noted however, that improving provider behaviour required multifaceted approaches at several levels (341).

3.2.3 Influence of Stigma in Alcohol Education and Clinical Language

Patients do not always seek help for their alcohol problems directly, and more frequently present with other less-stigmatising complaints. In a WHO led cross-cultural study

that examined the most stigmatising health conditions, “alcohol addiction” and “drug addiction” where cited as the 4th and 1st most stigmatised conditions respectively (342). The effect of stigma in that regard has been quite problematic in that it perpetuates a mark of social disgrace and blame for having a particular ailment (343). This tends to mitigate clinician intentions to ‘directly’ address alcohol consumption because it was not part of the original reason for the presentation. Such circumstances were among the factors identified by clinicians as preventing discussion about patient alcohol consumption in primary healthcare (200). Other belief factors included the sensitive nature of alcohol drinking, lack of time, availability of intervention tools as well as expectations about intervention effectiveness. The last factor in particular conveys clinicians’ doubtfulness of some EBP and the subsequent low uptake of best practice. Thus while there has been clear evidence that SBI practices are beneficial to patient care, there has been reluctance to implement certain types of treatment, perhaps to inadvertently avoid confronting the stigma (344). This suggests a relationship exists between clinical outcomes and provider attitude towards EBP in general, and provider education and disposition towards intoxicated patients in particular. It is also likely that the effects of stigma may moderate such relationships.

Negative attitudes regarding dependent persons have been indirectly reinforced in clinical schools or are part of the culture of medical institutions that deploy pejoratives such as “junkies” and “drunks” in reference to the patient population (321, 344, 345). This arguably leads to stereotypical views of certain classes of patients who may seek treatment for injuries while under the influence of alcohol in the ED. Furthermore, it can perpetuate the perception/stigma that any drinker who presents with alcohol-related issues has failed to effectively manage their consumption and may be exhibiting signs of ‘dependence-like’ lack of control. Stigma-laden language has been recognised as a significant determinant in whether a patient who presents with a substance-related issue will received evidence-based

care, particularly when the presenting concern is not drug related (343). That is, because dependence problems have been conceptualised as separate disorders, less a medical problem, this fragmentises potential treatment approaches while perpetuating barriers to comprehensive evidence-based care (346). Furthermore, stereotypes formed by stigma have been related to clinician lack of preparedness to address substance use, which has negatively impacted patient perceptions about health services as well as their desire to access treatment (347, 348).

A systematic review of stigma among health professionals and attitudes towards substance using patients revealed a number of consequences in terms of the impact on treatment delivery (349). In the review, 12 of the 28 studies were conducted in Australia, while the rest were from the UK, USA, Canada and Ireland. The studies included both quantitative and qualitative designs, sampled medical, nursing and allied health staff, and utilised standard attitude scales as well as incorporated focus groups. In general, the findings suggested health professional attitudes overall were negative towards substance using patients and contextualised the potential influence of clinician attitudes upon diagnosis and treatment. While clinician attitudes were strongly negative towards persons engaged in illicit drug use, a vignette study showed professionals held more stigmatising attitudes towards patients who were *currently* experiencing substance use disorder (349). Provider and patient views have been known to differ in terms of why treatment fails, but have acknowledged stereotyped language as well as lack of a therapeutic connection as chief factors (350). Nursing staff offered reasons for negative attitudes that included beliefs that care for patients who use drugs was emotionally draining and potentially dangerous. A commonly held belief of staff was that natural barriers of violence and irresponsibility existed with such patients, which affected the ability to establish any empathic connection during the clinical encounter. Consequently, reduced therapeutic alliance due to poor sense of efficacy on part of both the

provider and patient have been intrinsically associated with poor communication and negative experiences during the treatment process.

There has been an emphasis within addiction scholarship to destigmatise substance use language in particular and the medical treatment of those seeking help in general (351). In doing so, the effect of language can be realised in modifying attitudes and beliefs. For example, in a study that examined the effect of substance-related labels on staff perceptions, it was shown that when referring to a patient as "substance-abuser", beliefs were elicited that such persons were reckless, lacked control, and were more personally culpable for causing their problems (352). It may be important to acknowledge the moral connotations and conceptions of pejorative language currently used to describe substance related conditions. Such efforts could elucidate a core root of the problem by identifying how sociocultural nuances have impacted the process of clinician education and training (353). Changes in clinician language may subsequently affect behaviour in treatment practices and promote an increased uptake of relevant evidence-based practice (346). Categorically it has been advocated that action should be embraced to moderate such attitudes and beliefs early in the clinicians' career with improved educational programs and ongoing evidence-based training (348, 354).

Clinician attitudes have been critical factors as determinants of treatment outcomes and patient care (355, 356). Equally important is the language and implicit beliefs that undermine patient-provider communication and the therapeutic alliance that does not prosper as a result of negative attitudes. Such attitudes have been known to reduce the efficacy of any intervention or evidence-based treatment which can disempower patients and limit their sense of efficacy (348). Lack of appropriate drug and alcohol education, training and support may negatively moderate clinician perceptions of patient motivation and desire to change their behaviour. This may also minimise clinicians' investment in the therapeutic process and

impede successful implementation of treatment interventions. A prevalent attitude amongst providers has been “it is better to suspect illness than not-better safe than sorry” or that "an ounce of prevention is worth a pound of cure” (321). In regards to the alcohol dependent or ‘excessive drinker’ however, that traditionally positive attitude has often been reversed or vacated and may be intrinsically linked to the poor uptake/adoption of SBI as EBP. Learning needs analyses based upon staff attitudes may help better understand the moderating factors within medical education and training that reduce social stigma and eliminate the potential for stereotyped attitudes and beliefs to exist within the clinical setting (318).

3.2.4 A Call for Clear Connections Within the Evidence

Few Australian studies have examined factors affecting ED clinicians’ provision of ASBI as a response to alcohol-related injury. While some studies have assessed policies and practices, or the relationship between certain clinician characteristics and belief in SBI efficacy, attention to clinician opinions has not been common (125, 166). There has been little focus on the measurement of the strength of clinician opinions regarding ARI and SBI, and limited application of behavioural theory in understanding how these factors affect implementation.

Re-examining the idea of a formal response within the ED, a study of U.S. physicians’ attitudes toward alcohol-related presentations suggested that while the majority of those surveyed would support brief intervention, they also agreed that time was a significant barrier to actual implementation (244). Although some evidence has demonstrated support for screening and brief interventions as a formal response for ARI in the ED, more recent staff surveys showed routine implementation has not been achieved for a variety of reasons. As an example, Cunningham et al, (2010) identified provider time and financial resources as major ‘perceived’ barriers to implementation although there were positive attitudes towards SBI amongst ED directors (138). In a national survey of trauma surgeons, support for

implementation of screening and intervention programs depended on whether surgeons believed trauma centres were appropriate sites for addressing alcohol "disorders" and if they possessed an understanding of the concept of brief intervention (60). A test of the hypothesis that 'use of alcohol brief interventions in the ED was affected by clinician attitude' identified the most important factors associated with support of BI in the ED included, role responsibility and positive attitudes (161). It was concluded that agreement on the ED clinician's role to intervene as well as education targeting behavioural change were key elements to increasing the support and use of SBI as a formal evidence-based response to ARI.

The aforementioned studies demonstrated on one hand, some support for SBI when perceived barriers to implementation were minimal. A few barriers were noted as time factors and lack of confidence in ability to intervene. On the other hand, negative attitudes towards intoxicated patients and a lack of belief in the efficacy of SBI were associated with reduced support and lowered sense of role responsibility to provide BI. Exploring theoretical frameworks that provide transparency in this matter may generate a more accurate reflection of the current evidence and reasons for the apparent disconnects. Doing so may improve clinicians' opinions and conclusions about what is best practice and how they can strategically respond to ARI. However, unless formal responses systemically become routine practice, delays in effective treatment will continue, resulting in more debilitating (and advanced-stage) alcohol-related health conditions.

Improving how current education and training processes perpetuate attitudes of disinterest and reduced self-efficacy may help to modify clinician behavioural intentions to intervene in ARI. A robust theoretical foundation and conceptual model have the potential to reveal clearly testable hypotheses that advance the current discussion. That is, a theoretical model can be useful for capturing key elements of clinician behavioural intention that are

formulated during the educational and training phases of their careers. Such a model would be instrumental in developing and conceptualising key interactions within the context of EBP implementation. A theoretical approach also facilitates development of measurement scales that collect details on current attitudes and beliefs, as well as role expectations and other factors germane to the process. Thus, a theoretical framework that captures these nuances will be advanced in the next section to explore the evidence and delineate connections between reported clinician support for SBI and the poor uptake of SBI practice.

3.3 Theoretical Perspectives on Clinician Behaviour

From a public health perspective, theory represents "a set of interrelated constructs, definitions, and propositions that provides a systematic view of events or situations by specifying relationships among variables in order to explain and predict those events or situations" (357). By extension, theories in essence help to 'explain behaviour and suggest ways to achieve behaviour change in addition to guiding the development of interventions that capitalise upon that change' (358). Using a theoretical framework to develop a research agenda in the ED has been recommended for several reasons. Theoretical frameworks have facilitated hypothesis testing on relationships between variables and have permitted the ability to delineate potential factors related to specified outcomes (61). These frameworks have been a means for setting discrete agendas and identifying processes that influence observations. They have also provided the steps for duplication in later studies as well as identified the key ingredients used in an informed intervention aimed at affecting outcomes of interest such as clinician behaviour change (359, 360). Theory-driven approaches to understanding and modifying behaviour not only provide justification and insight into change, but also offer a mechanical blueprint for mapping out change processes (361).

3.3.1 Rationale for a Theoretical Framework

The rationale for choosing the theoretical framework to be used in this thesis is based upon the premise that theory-driven approaches provide valid and reliable means to understand and modify clinician behaviour. Such approaches also increase efficiency and specificity of clinician-targeted public health interventions (361). Efficient and specific interventions that consistently use accurate measurement ensure valid outcomes. For example, use of an appropriate alcohol screening tool and a well-defined outcome of interest such as consumption pattern or re-injury rate, facilitates evaluation of clinician interventions to deliver SBI. With an established theoretical framework in place, that evaluation can control for clinician factors such as attitudes towards ARI, sense of efficacy to implement SBI and behavioural intention to perform SBI. As mentioned in section 1.2.4, it has been critical to explicitly identify the context, mechanism and outcomes of any public health response particularly in the form of a targeted intervention. In this manner, intervention outcomes have been used to develop evidence-based guidelines for implementation of routine clinical practice (362). The advantage of routine practice is an increase in staff adherence to the recommendations of evidence-based guidelines resulting in a positive impact on actual clinical practice and improved patient outcomes like reduced ARI. Intervening in such potentially preventable incidents such as alcohol-related injuries offers public health savings that would have a significant impact on the national burden of disease as well as quality of life for those at risk. Hence, the purpose of the current research project is to evaluate a theoretically strategic method that is consonant with accurate measurement and achievable outcomes relative to clinician behavioural intention.

In recent years, there has been a broader integration of prevention programs and public health-related frameworks that examine health behaviour and health education in emergency care settings (61, 363-365). A distinguishing feature of public health research is its focus on

assessing and measuring components and processes at the population level. Compared to traditional biomedical research, which focused on the individual patient, emergency medicine is best positioned to bridge the biomedical and public health approaches for addressing injury and disease through the promotion of health awareness at the population level (363). As discussed in section 1.2.3, there has been an extensive amount of injury research focused on the population-level impact that alcohol-attributable injury has had on the global burden of disease and illness. To add, this research has substantiated the need for a theoretical framework that moves beyond traditional biomedical models, to considered the broader implications of public health research in emergency care (15). Those implications include a complex assembly of designs that cover a broad spectrum of processes from theory to practice.

3.3.2 Delineating the Level of Approach

The relationship between theory, research and practice has been recognised as a non-linear complex interaction, particularly when considering the implications of refining that relationship within the health behaviour domain (358). The relationship in that context can be described as a cycle of interactive processes that includes identifying behavioural factors, determinants of health, implementation processes, and how EBP is delivered. Ideally, there is a bidirectional influence between the theoretical, research and practice elements in an ongoing effort to improve upon the outcomes centred on the evolving evidence-base. In the case of the uptake of research evidence into health care practice, the relationship has been similarly described as complex, as well as haphazard and unpredictable (366, 367). It has been suggested that to adequately understand and disentangle the complexity of health care practice and implementation, four levels of approach are necessary (368):

1) The individual health professional,
2) Health care groups or teams,
3) Organisations providing health care,
4) The larger health care system or environment in which organisations are located

A combination of theories has been used to study clinical practice at the four levels mentioned above. Such theories and models range from social cognitive and motivational theories to organisational and diffusion models (261, 369). For example, Diffusion Theory has been useful in determining the global components required in the adoption or uptake of clinical guidelines and considers aspects of a new technology (innovation) in the decision-making process (370, 371). Organisational change theories have been important in understanding the multilayered influences that arise when organisations introduce new goals, programs, technologies and policies. Approaches at the organisational level tended to be contingent on socioenvironmental factors that are often outside the organisation's control. This often required an ecological framework to guide the development of relevant activities (372). Since health care systems have many levels, organisational theory can be useful to penetrate those environmental factors at various levels or strata of the system. Therefore contingency theories such as Stage Theory or Organisational Development Theory, which examine macro level factors would be most appropriate for the 3rd and 4th levels noted above (373).

Comprehensively, it would be most efficient to simultaneously incorporate the macro elements of such a process as well as the individual level approaches. These multilevel change approaches often require a vast amount of resources and stakeholder investment as well as multiple agencies, organisations and national support (368). However, the purpose of the current research is to examine individual level behavioural processes using a theoretical perspective that provides reflection on behaviour change, as well as how behaviour change may occur. While this latter point may imply a causal explanation, this has not necessarily been an outcome of this research. That is because causal explanations have usually required experimental designs, or observation of actual behaviour contingent upon a change factor such as an intervention (374). Although an intervention will not be employed at this point,

building the current framework will enable development of a future intervention. A primary purpose will be to describe the framework and processes that can lead to change, but not necessarily explain causality of behaviour change in and of itself. The following review of the evidence examines theoretical frameworks that guide research approaches centred around 1) the individual health professional and 2) health care groups or teams (i.e. ED staff).

Eccles et al., (2005) noted that while different theories have been relevant to interventions and processes at the four levels, it has been essential to specify the level of approach and the relevant theory or model, as well as the rationale for choosing between them. This research project will be based upon individual and groups of healthcare professionals within the ED setting, thus necessitating a model of individual behaviour. In developing theoretical frameworks for understanding clinician behaviour, an assumption has been made that clinical practice is a form of activity or performance which can be described in terms of general theories of human behaviour (366). Generalisable models have been derived from such assumptions and have included exogenous factors including provider attitude or provider perceived control over a particular behaviour (375, 376). Similarly, models have evolved to consider nonvolitional components such as individuals' perceptions of organisational barriers and facilitators, which represent the assumption that providers working in a healthcare system do not always have autonomous control over their actions (168, 365, 377). Refined models developed into a robust theory, have then be used to identify and test explanatory factors of clinical practice. For example, it has been noted that up to 50% of patients do not receive quality care in line with the current scientific evidence (366). Some areas of query in this regard could include how guidelines are developed to offer direction for clinical practice. There also exists the problem of clinician utilisation of such guidance as well as clinician behaviour change (377).

3.3.3 Theory and Implementation Research

Theory-grounded methods have been used to approximate the relevant constructs and mediating factors that contribute to poor implementation of current EBP. It has been hypothesised that antecedents to behavioural intention (and thus behaviour) are key factors impacting clinician utilisation of guidelines and current research evidence (378-380). Some of these antecedents have been investigated using specific theoretical frameworks and conceptual models in implementation research (381). Connected to this approach have been implementation studies that explore how a reasoned action framework, captures the process of EBP within clinical care (382, 383). As a scientific study of the methods that facilitate the uptake of research findings, 'implementation research' often uses theory to examine the antecedents or proximal influences of health providers' behaviour in clinical practice (360, 361, 384-387). Formal theories or conceptual models are utilised to clearly operationalised outcomes of interest. It also noted that use of conceptual models of health behaviour was best for hypothesis testing followed by empirical validation as a means of improving ED intervention practices (61).

Behavioural sciences and implementation research grounded in theoretical approaches have been used to build general models of human activity and guide studies on clinician behaviour (261). Within the context of injury prevention, it has been noted that the behavioural science method was integral to a comprehensive approach for addressing injury as a public health burden (388). This was because like many current diseases, injury and violence are also related to avoidable behaviours and therefore amenable to preventive interventions. However, insufficient scholarly attention has been devoted to understanding the intersection between 'preventive' responses to alcohol-related injury, clinician behaviour in the ED and the use of theory as a supporting framework (243, 361, 389). For example, in the controlled trial by D'Onofrio et al, (2002), it was proposed that improving knowledge

would enhance attitudinal responses of clinicians towards alcohol-related presentations in the ED. While the intervention did improve charted practice, it did not improve attitudes and beliefs related to perceived practice with substance-using patients. This study did not provide an explicit theoretical rationale for the intervention making it difficult to interpret the results. On the other hand, if a theoretical underpinning was provided, it may have been possible to discuss how/why the intervention was able to enhance knowledge, even though knowledge did not predict "perceived" improvements in evidence-based practice, and why the intervention did not change implicit attitudes/beliefs. In short, explicit methods and models can provide deeper insight into whether or not an intervention can influence underlying theoretical constructs (366).

3.3.4 Social Cognitive Theories and Model Conceptualisation

Disentangling the diverse factors related to irregular uptake of SBI in the ED requires close examination via a model or theory that conceptualises the process of provider behaviour and clinical practice uptake. Unfortunately, the heterogeneity between interventions as well as target behaviours and study settings has complicated generalizability of study findings. As a result, Godin (2008) and Eccles (2006) provided some of the first systematic reviews of social cognitive theories used to explore clinician behavioural intention. An emphasis was placed on the importance of accounting for factors that may constrain clinician behaviour such as imperatives dictated by a professional role or aspects of clinical governance. However, it was concluded that the categorical variables most efficient at predicting clinical behaviour were intention and capability beliefs. These seminal reviews also suggested the Theory of Planned Behaviour (TPB) was an appropriate theory to describe and predict clinician behaviour (261, 390).

The Theory of Reasoned Action (TRA) and its extension, TPB are among the most widely cited and researched models for understanding and developing behaviour change

interventions in health (359, 391-393). The TPB is a theoretical framework that models the relationship between intention, its antecedents (attitudes, social norms and perceived behavioural control), and behaviour as the dependent variable. According to the TRA, attitudes and social norms are immediate determinants of intentions to perform behaviour or carryout an action. By extension, the TPB posits perceived behavioural control (PBC) has an additional direct effect on the intention-behaviour association (Figure 2). The TPB was developed in response to the limitations of the original TRA model in accounting for partial volitional control (376). For example, an ED clinician may express willingness to perform a brief intervention for ARI, but feels unprepared because they were never trained in brief interventions. Previously the TRA did not accurately account for this perception whereas the TPB addition of behavioural control would account for the perceived inability despite the expressed intention.

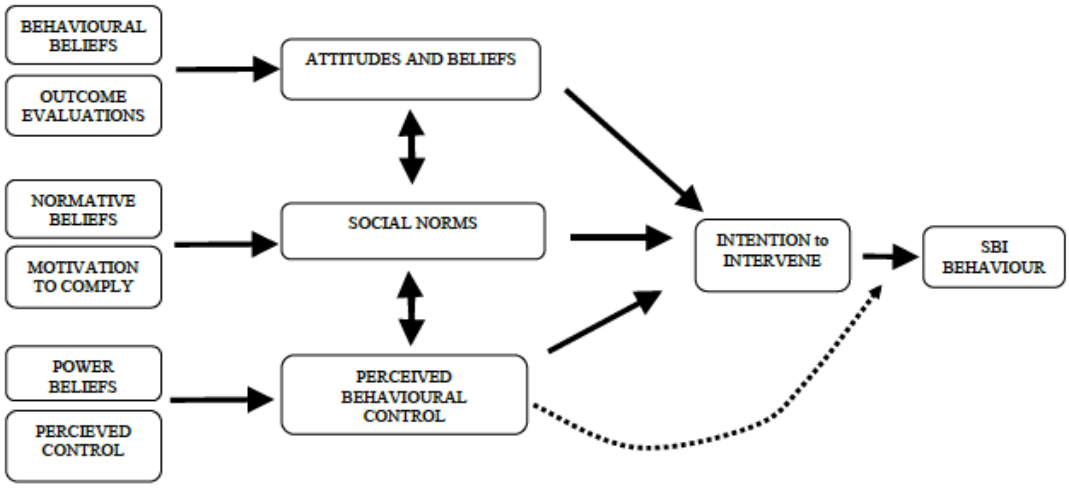


Figure 2 Model of the Theory of Planned Behaviour

All three TPB constructs; attitudes, social norms, and PBC are influenced by salient beliefs and evaluations of the outcome relative to that particular construct (376). For

example, attitudes are determined by the individually held beliefs concerning the attributes of an object/action and the evaluation of those attributes. Similarly, normative beliefs associated with important others' expectation about the behaviour and one's motivation to comply with the referent's expectations make up the social norms construct. Perceived behavioural control can act as both a direct determinant of intention, and a modifier of the intention-behaviour relationship and is influenced by both power beliefs and perceived control in relation to the action of concern. Valid measure of the first-order components is expected to sufficiently account for all meaningful variance in behavioural intention within the model. The following section provides further detail on the model as well as each TPB first order construct and added factors, including recommended methods and strategies for valid measurement (394).

3.4 The Theory of Planned Behaviour (TPB)

There has been some consensus on which theoretical constructs are best used for interdisciplinary frameworks to improve clinician compliance with evidence-based practice (379, 395, 396). Routine compliance with EBP has been known to yield an increase in the rate of provisioning recommended treatment and improved patient outcomes (397). However, routine practice that is consistent with the evidence has not been common and inadequate guideline compliance has been a complex and difficult task to model (309, 398). Findings from theorist consensus have identified key constructs of clinician behaviour change that were common across a number of models and theories (379, 395, 399, 400). Many of these constructs such as intention, attitude, social norms, role belief and perceived control/self-efficacy, have been incorporated into the Theory of Planned Behaviour (TPB). The TPB proposes that intention is the primary determinant of behaviour, and was developed by Fishbein and Ajzen in an effort to explain cognitive self-regulation as an aspect of human behaviour (376). Commonly used as a theoretical framework within health research, the TPB provides an intuitive approach for describing the interactions between attitudes/beliefs,

confidence/skills and clinician behavioural intention within the context of EBP. As such, the TPB offers the opportunity to explore clinician effects on treatment mechanisms and the nature of those influences that may account for variability across patient outcomes. Thus while clinician personal characteristics (e.g. age, gender years of clinical experience etc.) have not always been consistent with regards to clinical outcomes, behavioural qualities such as attitude and therapeutic alliance have been linked to favourable outcomes between clinician and patient (401, 402). The TPB delineates such constructs within a cognitive framework by accounting for underlying beliefs that are consistent with an individual's existing attitudes and perceptions about outcomes associated with reasoned actions.

Theories often come with a set of assumptions as to how and why relevant constructs may or may not always explain processes inherent to the model. In terms of rational actions and the intrinsic beliefs that drive behaviour, the TPB model assumptions have been quite explicitly stated by the theory developers, Fishbein and Ajzen:

> "Importantly, there is no assumption in the TPB that behavioural, normative and control beliefs are formed in a rational, unbiased fashion or that they accurately represent reality. Beliefs reflect the information people have in relation to the performance of a given behaviour, but this information is often inaccurate and incomplete…However, no matter how people arrive at their behavioural, normative and control beliefs, their attitudes towards the behaviour, their subjective norms and their perceptions of behavioural control follow automatically and consistently from their beliefs. It is only in this sense that behaviour is said to be reasoned or planned. Even if inaccurate, biased or otherwise irrational, our beliefs produce attitudes, intentions, and behaviours consistent with these beliefs" (403)

Numerous theoreticians and researchers have tested and accepted the Theory of Planned Behaviour (TPB) as a robust framework for not only describing, but also explaining clinician behavioural processes within the context of EBP (360, 400, 403, 404). Meta-analytic reviews of the efficacy of the TPB provided substantial evidence supporting the use of this theory for predicting intention and behaviour (359, 393, 405). Expectedly there has been some contention that a construct such as intention may be a necessary but insufficient condition for the performance of a *new* behaviour (406, 407). Thus theoretical improvements were made to the base theory-The Theory of Reasoned Action- to include perceived

behavioural control (self-efficacy) as a construct that has an impact on behaviour in addition to its influence on intention within the model (376). It has been noted that the utility of a method is best recognised by its interim endpoints which should have predictability in practical outcomes (408). Behavioural intention and self-efficacy meet this utility condition and have been incorporated into practically all social-cognitive models of health behaviour as the two best predictors of future behaviour. Of those models, the TPB offered the most comprehensive set of constructs for measuring and analysing behavioural intention. It is with this consensus and the rationale described above that the TPB will be used within this program of research to examine ED clinician behaviour in relation to alcohol-related injury and screening and brief intervention uptake.

3.4.1 Construct Measurement-Attitude

Early attitude research had been based on implicit assumptions how attitudes were associated with behaviour. Several explanations were advanced which argued for a multidimensional structure of attitude and included cognitive, affective and conative components (375). It followed however that single attitude scores did not adequately represent such components and therefore failed to accurately predict behaviour. Through a series of investigations that submitted these assumptions to empirical tests, Fishbein et al, (1970) integrated more valid and reliable determinants of behaviour into a single conceptual framework. The TPB posits that the first-order construct *attitude* is determined by beliefs about behavioural outcomes or attributes, and the strength of each belief is weighted by whether the outcome is considered positive or negative (409). In this study, clinicians' attitudes towards ARI and attitudes towards SBI were assessed and weighted by positive or negative beliefs in regards to the outcome of dealing with ARI and providing SBI respectively. That is, attitudes towards ARI and SBI were measured and positive/negative evaluations of the outcomes related to each were used to weight those measures. Clinician

experience in this regard may also affect behaviour by reinforcing either positive or negative beliefs/evaluations and thus indirectly impact the likelihood of implementing SBI. As an example, a clinician who has more positive experiences with ARIs and more successful attempts at performing alcohol SBI compared with other clinicians, may have a more positive evaluation about ASBI, a more positive attitude about ARI in general and an increased likelihood of implementing SBI. Thus, indirect beliefs served as proxies of the value attached to behavioural outcomes associated with the base attitude and relevant experience.

With the exception of behaviour, all variables in the TPB model are psychological constructs and can be measured directly and indirectly. Direct measurement of the attitude construct involves asking respondents about their overall attitude. Indirect measurement queried specific behavioural beliefs and evaluations of the associated outcome. While these two measurement approaches were initially predicated upon different assumptions about the underlying cognitive structures, later recommendations were not as stringent about the inclusion of indirect measures (410). Since clinician survey response rates have been known to be dependent on survey length, it was decided to not always include indirect items for each behavioural outcome, normative referent or power belief in the survey.

Frances et. al, (2004) have recommended that direct measurement of attitude employ the use of bipolar adjectives which are evaluative (e.g. *good-bad*). A set of items should also include instrumental beliefs to indicate whether the behaviour achieved something (e.g. *useful-worthless*) and experiential beliefs to assess how it feels to perform the particular behaviour (e.g. *pleasant-unpleasant*). Inclusion of a *good-bad* scale also captured overall evaluations of interest. After recoding for negatively worded endpoints, mean scores of correlated items were recommended for generating overall attitude scores. Detailed discussion was devoted to scale development and feasibility in chapter 6. Indirect measures were elicited from in-depth focus group interviews to identify the content of behavioural

beliefs shared amongst the target population (described in detail in Chapter 5). Behavioural beliefs and outcome evaluations in this regard provided weight to the strength of the attitudes measured directly. That is, an evaluation of the relevant outcome was measured indirectly in order to assess how strong the belief was of the action being performed. Thus, for example, the strength of the belief that it is "*It is worthwhile to identify and provide an alcohol brief intervention"* would be weighted by the indirect measure "*Screening for alcohol harm in injury cases will detect risk factors for future injuries"*. In this manner it is expected that the cognitive, affective and conative dimensions of attitude will have been adequately represented/accounted for in the behavioural intention of clinicians towards ARI, screening and brief interventions.

3.4.2 Construct Measurement-Social Norms

Social and interpersonal cues related to perceptions about engaging a particular behaviour are also considered in the TPB under the first-order construct *social norms*. Social pressures from significant others to perform a behaviour has been the focus of several social psychological models. This is indicative of the importance associated with how actions can be influenced by perceptions of other people's opinions. The model suggests a person's estimate of the social pressures to engage/disengage a particular action is reinforced by two components working interactively: normative beliefs (ideas about how important others would expect them to behave); and, motivation to comply (how likely one is to meet the expectations of important others). Hence, the perception that one's supervisor expects that SBI be performed when alcohol-related injuries present to the ED, is likely to positively influence a clinician's intention to intervene in such cases. Notwithstanding, the effect of social norms may be more significant for a minority of people for whom a stronger collective self prevails over the private self (411).

Direct measurement of the social norms construct has involved use of questions that referred to the opinions of people considered having an impression upon clinicians. These opinions identified the potential for clinicians to feel social or organisational pressure to perform certain functions such as administer an alcohol screen or provide a brief intervention. Such questions would indicate whether clinicians agreed/disagreed with statement about what was expected of them in a particular situation or what people who were important to them thought they should do. Indirect measures of social norms were elicited during the qualitative study to identify commonly held beliefs (norms) amongst relevant individuals, organisations, services etc. The willingness to remain within the status quo (motivation to comply) was also assessed during this process. Recommended measurement of direct and indirect social norms items has employed the use weighted belief scores summed across relevant beliefs to obtain an overall score. For example, a reference group's expectation or opinion of the clinician's action would be rated by the clinician. This rating would be weighted by the level of importance in complying with that expectation. As suggested in the attitude section, use of bipolar adjectives which were evaluative of the perceived pressure as well as the level of importance were integrated into the questionnaire design.

Important others identified within the elicitation phase could have been a direct line manager or director of the service, as well as government bodies or professional organisations in which the clinician might have membership. For example, a nurse may have identified their nurse educator or nurse manager as someone whose expectation about their work was rated as very important to them. A doctor who was a member of the Australasian College of Emergency Medicine might consider that organisation's opinion about conducting ASBI to be highly regarded and therefore identified the College as an organisation to reckon with under the social norms construct. In this instance, clinicians' opinions were elicited as to how strongly they were inclined to comply with an important other's expectations to perform

ASBI. Opinions and indirect measures elicited from the focus groups were used to develop stem items for the social norm construct in the quantitative survey. For example, the strength of the direct measure *"When patients come to the ED with an alcohol-related injury, there is an expectation to conduct an alcohol screening and brief intervention with them"* was weighted by the indirect measure *"Meeting the expectations of my colleagues to conduct SBI for alcohol-related injuries is important to me"*.

A main objective of measuring this first-order construct was to identify social pressures endorsed by clinicians that were significant enough to warrant compliance. Consequently, the social norms construct has provided a measure of whether clinicians believed there were important others who would approve or disapprove of their intervening in ARIs using SBI. It has also provided an indication of how strong the perceived pressure was and how likely they would comply with this pressure. Of note however was evidence to suggest intentions based upon social norms may not have as strong an effect as intentions based upon attitudes (406). Previous studies have demonstrated a low and sometimes insignificant influence of social norms on the intention-behaviour relationship in some populations and across certain behaviours (411). A notable amount of the empirical evidence has supported this perspective suggesting social norms accounted for only a small proportion of the variance in intentions above and beyond attitudes (412, 413). This aspect of the model has required testing of zero-order correlations to determine the effect from each construct on intentions. Based upon the previous discussion, it may be that junior clinicians who give more weight to senior colleagues' impressions and social pressures to perform, may subscribe to a stronger collective or public self and therefore demonstrate a stronger social norm effect. That is, junior clinicians who may feel more social pressure and a greater need to comply with the status quo will have demonstrated a greater effect in this construct compared to senior clinicians with less concern about social milieus. This could imply relevance of within-

profession differences associated with higher collective identity and the social norm-intention relationship amongst professional subgroups.

3.4.3 Construct Measurement-Perceived Behavioural Control

Theory of Planned Behaviour came about as a result of the first-order construct *perceived behavioural control* (PBC) being added to the Theory of Reasoned Action (TRA) model to account for aspects of self-efficacy and confidence to perform an action (414). In essence, PBC provides a measure of the actor's perceived control over the conditions of an action and the perceived ease or difficulty of performing that action. In this regard, the TPB addressed the TRA limitation of not accounting for volitional control. Implicit within the PBC construct are internal factors of the actor that include knowledge, skills, abilities as well as external factors such as time, obstacles, job training and other resources (414). Furthermore, the theory assumes the effect of PBC on goal-directed behaviour is mediated by intention. However, later theoretical development has also provided consideration of a direct link between PBC and behaviour. In this instance, performance of behaviour is not only dependent on motivation but also adequate control of the behaviour of interest. As such, when actual control is low, the PBC construct exerts its influence on behaviour indirectly via intention, and more direct when actual control is high and accurately perceived by the actor. That is, an actor will demonstrate more willingness and exert more effort to perform a particular behaviour when they perceive they have higher control over their actions. (415).

The PBC construct provides information perceived by the actor that potentially constrains behaviour and has been a good indicator why intentions may fail to consistently predict behaviour (376). PBC is posited to exert both a direct effect and an interactive effect on behaviour via intentions. In this regard, the addition of PBC becomes important as volitional control over behaviour decreases due to factors beyond the actor's control. Where the behaviour is not under complete volitional control, PBC is assumed to moderate the

relationship between intention and behaviour (405). When there is increased volitional control, PBC is assumed to have a more significant effect directly upon the behaviour of interest. However, this interactive relationship will vary by population and is based largely on the behaviour of concern.

Ajzen (1991) conceptualised PBC as being synonymous with Bandura's (1977, 1982) concept of self-efficacy. According to the original conceptualisation, PBC represented the perception that controlling an action was easy or difficult, while self-efficacy reflected the extent to which the individual believed they were capable of performing the action (336, 416). Contrastingly, there has been some work to suggest there may be a distinction between PBC and self-efficacy (417, 418). It has been proposed however, that variation in study outcomes may have been due to a lack of clear conceptualisation of internal and external locus of control as well as poor specification of actual behaviour and what may have been a goal-oriented action (419, 420). To extend, there have been convincing arguments that there was some degree of overlap between the two constructs in that both are concerned with confidence and control (382, 403, 421, 422). In short, the conceptualisation of PBC in the model satisfies the intended purpose of the current research to capture the subjective degree of control over behavioural performance. However, it has been advised to develop separate measures of PBC that explain both internal locus of control (self-efficacy/control beliefs) and external locus of control (perceived power) factors in accounting for the multidimensional influences on behavioural intention (419, 423, 424). Therefore, this research assumed in most instances that clinicians were acting with another person (the patient) to derive a particular outcome and that outcome may not have always been under the volitional control of the clinician (i.e. a reduction in the patient's future alcohol consumption). In this instance, the clinician's behaviour would be considered goal-directed, where the actual behaviour was

applying ASBI, and reduction in the patient's alcohol consumption would be classified as the goal.

Perceived behavioural control has been shown to be especially relevant to clinical behaviours shaped by structured work environments such as the ED, where set protocols and policies exist to govern practice directly and indirectly (425). Such work environments may introduce obstacles unique to the organisational setting and require approval or collaboration with colleagues, managers, and/or patients to perform a particular behaviour. In this regard, the inclusion of the PBC construct may serve as an adequate measure to account for (non-) volitional aspects of clinician intention to perform SBI. Similar to the previous constructs, PBC is also influenced indirectly by beliefs (control) that include perceptions about the barriers, skills and confidence that may be based on past experience or vicarious information received about the behaviour (414). Thus theoretically, a clinician who perceived SBI was an easy task with minimal barriers will have been more likely to intend to perform the behaviour than a clinician who felt the behaviour was difficult and fraught with obstacles. Insofar as the clinician's perceived control beliefs accurately reflect actual control, PBC has been able to directly predict behaviour. Thus, PBC may serve as a by-proxy predictor of behaviour if the clinician's perception of behavioural control is accurate and there is an inability to otherwise measure actual behavioural control.

Direct measures of perceived behavioural control have included asking direct questions about clinicians' confidence in their ability to perform a behaviour such as implementing ASBI. These items have rated the difficulty in performing such behaviour or the likelihood that it could be done in certain circumstances. Behavioural controllability has also been measured directly under this construct by tapping onto perceptions of control and whether or not the respondent thought the performance of the action what up to them. Indirect measure of PBC has been obtained by assessing personal control beliefs and perceived power

beliefs via elicitation interviews. The indirect measures based upon control beliefs and perceived power should be associated with the direct measures, which is associated with intention and behaviour (358). As an example, clinicians were asked *"I am confident I can appropriately screen and advise patients in the ED about drinking and its effect on injury risk"* as a direct measure of PBC which was weighted by the indirect belief response to *"It is easy to identify and distinguish patients with hazardous/harmful drinking"*. This line of query addressed the self-efficacy aspect of the construct while a different dimension has tapped onto the controllability aspect: *"The decision to perform alcohol screening and brief intervention for injured patients in the ED is entirely up to me"* which was weighted by *"When patients come to the ED with an ARI, there is not enough time to conduct an ASBI with them"* and by *"I am not currently aware of any alcohol screening tools/resources in my ED for patients that have ARI*".

3.4.4 Construct Measurement-Role Legitimacy

While the developers of TPB suggest the three constructs (attitude, social norms, PBC) were adequate and sufficient enough to account for a significant amount of the variance in behavioural intention, there are provisions for examining outside constructs that may add to the overall explanatory value (426). This includes T-A-C-T criteria (target, action, context and time) to determine feasibility of including an additional construct. In the unique case of clinician's sense of responsibility to 'perform SBI' (action) 'in the ED environment' (context) for 'patients' (target) 'when they present with an alcohol-related injury' (time), 'role legitimacy' was hypothesized in this study to initially meet criteria. It may be that PBC accounts for a sufficient proportion of this factor, however it was important to test whether the sense of role legitimacy adds any further explanatory value beyond the three existing constructs originally in the model. The role legitimacy construct was hypothesized to account

for interpersonal and structural constraints by considering the organisational endorsement/resistance of clinicians' role to intervene.

Role legitimacy has been referred to as the clinician's perceptions about their right and responsibility to intervene in a problem and the professional boundaries ascribed to that responsibility (159, 188). In a review of the literature, professional role identity was amongst a list of significant factors that most consistently explained intention (261). Aspects of role identity within social cognitive theories have also been helpful to explain significant differences between professions in terms of intention prediction (159, 427). Due to the often chaotic nature of the ED environment, many practical impediments contribute to underutilization of evidence-based practice and prevent sustained implementation of SBI. Consequently, development of practitioners' capacity to adopt evidence-based approaches sometimes extended beyond assumed individual knowledge, skills, attitudes, social pressures, and perceived ability. To effectively enhance this capacity, other professional and organizational factors needed to be considered (270). For example, clinicians may not have engaged in SBI because they did not feel supported in this role. Conversely, 'believing' one has a professional role to address certain behaviours such as risky alcohol consumption has been a driver to increasing the likelihood of intervening in ED presentations (427). Indig et al (2009) reported a low level of efficacy and role legitimacy amongst ED staff working with patients in an alcohol-related context. Their study concluded ED staff required more training and support to improve SBI skills. In addition, engaging patients with alcohol-related issues entails reinforcing a sense of legitimacy as evidence-based practitioners. Adopting a sense of legitimacy in one's role as an ED clinician, to conduct screening and brief intervention during alcohol-related presentations has been an essential precursor to effective practice implementation (188, 199).

Understanding how clinicians perceive their role in terms of responding to alcohol-related harm has been an important step in addressing potential barriers to effective practice (159). As an example, supervisor or management expectation to provide screening and brief intervention for ARI in the ED is likely to positively influence staff sense of role legitimacy to intervene. Additionally, if the institution in which the clinician works endorses this intervening role, the sense of role legitimacy will be reinforced. However, if a clinician has colleagues who express contempt for 'addicts' seeking services, this may bias that clinician's intentions, causing ambivalence or inconsistency in clinical practice and role responsibilities/identity. Conversely, if a senior clinician possessed a positive/obligatory sense of role legitimacy to intervene, the theoretical likelihood of responding to ARI would be high. It may be that within the ED, certain cultural/structural barriers have been perceived as limiting autonomy to intervene. In the current context, model specification requires an organisational construct to account for this effect (403). The TPB model controls for such external factors in the PBC construct, but this organisational effect maybe more precisely measured by the clinician's own sense of role legitimacy. Controlling for these external influences may explain some of the variance in behavioural intention not better accounted for by the other three constructs. Thus in this research project, a measure of role legitimacy has been introduced into the model in order to test whether there was any added effect not otherwise captured by the original theoretical framework (refer to Figure 3). In order to glean relevant indicators of role perceptions, and consistent with TPB guidance, focus group questions were developed for eliciting indirect beliefs about role legitimacy from the target population. Those indirect beliefs assessed beliefs about one's role in the given capacity as well as the sense of responsibility as it relates to intervening being a legitimate part of one's job.

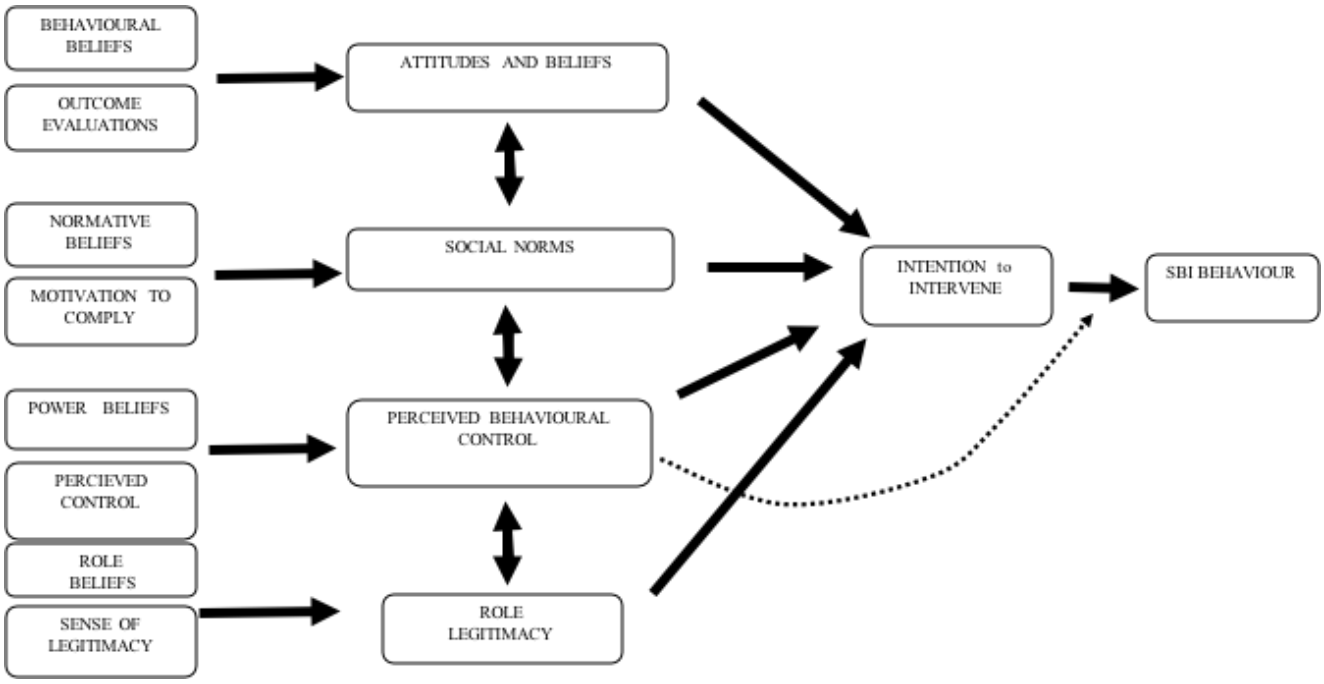


Figure 3: Conceptual Framework adapted from the Theory of Planned Behaviour-Role Legitimacy

In order to measure clinicians' sense of role legitimacy, items were developed to assess how responsible they felt they should be in this particular regard. For example, clinicians were asked whether they agreed with the statement; *"It is within my role responsibility to offer patients a brief intervention for harmful/hazardous alcohol use"*. To establish the strength of this statement, this item was weighted with the indirect belief *"I feel a responsibility to ask injured patients for information that is related to their drinking behaviour"*. It was hypothesized that role legitimacy would account for fluctuations in intention to intervene in ARI by capturing clinicians' perceptions about their right and responsibility to do so, and the boundaries ascribed to that responsibility. As such a limited sense of role legitimacy as an ED professional would be associated with poor uptake of SBI practice and reduced willingness to take control of the practice. An interactive effect would also be observed whereby the influence of role legitimacy on intention would be mediated by

the belief in the efficacy of SBI in reducing patient drinking behaviour and this would likely vary by profession.

3.4.5 Construct Measurement-Behavioural Intention

An assumption within the TPB is that motivational factors influencing a particular behaviour are captured within the actor's *intention* to perform said behaviour. As a central factor in the theoretical framework, intentions indicate how much effort an individual is willing to exert or how hard they are willing to try to achieve the behaviour (376). Measurement of the first-order construct *'intention'* has been given extensive consideration over the last few decades (375, 407, 411, 428). For example, Trafimow (1996) conducted a study to explain the difference in the variance of intention based upon attitudes vs. intention based upon social norms. Use of a within-subjects analysis revealed important differences between subjects who are under attitudinal control and those under normative control. Disaggregating between the two types of control revealed those more likely to subscribe to a private self (high on attitude predictors of intention) were unique in their measures of intention from those more likely to subscribe to a collective self (high on social norms predictors of intention) (429). That is, peoples' intentions to act were consistent with normative and attitudinal beliefs and people as well as behaviours can be under attitudinal or normative control. In addition, the commonly observed small effect social norms has had on behavioural intention has been better explained by the idea that a minority of people operate under normative control. This has produced a modest but consistent normative effect across most studies (411). In short, there has been good evidence to suggest intentions based on attitudes have better predictive value than intentions based on social norms (406). Therefore it has been important to analyse the strength of attitude-intention and social norm-intention correlations in survey results. This has provided additional insight into the strength of the

intention-behaviour relationship when poor consistency between the two latter constructs was observed.

The TPB proposes that strength of intention is a good indicator of how likely clinicians are to act and how much effort they are willing to invest to enact that intention. However, the intention-behaviour relationship has been shown to be moderated by actual control over the behaviour (428). Lack of actual control over behaviour will tend to reduce the predictive validity of intentions. When planning a particular behaviour, experiential, descriptive and autonomous influences affect intention (426). Planned behaviour is assumed to be a causal chain that links beliefs to behavioural intention via attitudes and social norms (430). By extension, perceived behavioural control increases the explanatory variance in the overall causal chain by assessing individual sense of control and perceived power (autonomy) to enact the behaviour (376). These constructs have been conceptualised as determinants or predictors of intention to perform a specific behaviour. Applied to the current area of interest, the "behaviour" was identified as "implementing SBI in the ED for alcohol related injury".

Behavioural intentions have been considered 'instructions people give to themselves to perform in a certain way' and in essence form the decision to act (431). Inferences from respondents about how they think they would act have been elicited from statements with the form' "I plan to do X" or "I would do X". In this respect, behavioural intentions hold potential information about both the direction and the intensity of the decision (428). However, low facilitating conditions may moderate or even deter implementation of an intended behaviour. A particular area of theoretical research on implementation intentions has received increased attention and development especially in relation to clinician behaviour (432). This research has demonstrated that in querying behavioural intentions, it has been advantageous to specify conditions under which the behaviour would occur in order to reach more accurate conclusions about the direction and intensity of intentions. For example,

merely holding a strong intention ("I plan to conduct X") does not ensure achievement of a stated goal, and may have been a further reason why intentions may fail to accurately predict behaviour. However, detailing the when, where and how of a goal-oriented action via implementation intention has been shown to have a positive impact on goal attainment and behaviour outcomes (433). Thus examination of this construct in the study involved use of several indicators to assess conditions under which clinicians were most likely to endorse intention to perform ASBI and how strongly they felt about such intentions.

Based upon guidance for constructing a TPB questionnaire (410), behavioural intention was measured using items that assessed how likely under certain conditions, the clinician indicated willingness or plans to respond to alcohol-related injuries. As an example, respondents were asked how much they agreed with the statements; *"If alcohol screening and brief intervention policies and procedures were available in the ED, I would conduct a screening and brief intervention"* or *"If the ED provided practical tools such as smart phone apps for alcohol screening and brief intervention, I would conduct a screening and brief intervention"* or *"I am highly likely to conduct an alcohol screen and brief intervention for alcohol-related injury in the next 30 days".* These particular items were weighted by measures that endorsed *interest* in ASBI specific training or receipt of tools to facilitate SBI implementation. For example, the clinician was asked to indicate agreement with the statement; *"I am interested in receiving training in alcohol screening and brief intervention".* In this manner, the strength and direction of intention was assessed by providing respondents with a set of conditions that could be considered in the decision-making process to facilitate or impede action.

3.4.6 Conceptual Measurement Synopsis and Interaction Effects

A number of factors have accounted for the variance in clinician behaviours in relation to the use of evidence-based practice as a response to alcohol-related problems. The Theory

of Planned Behaviour has been helpful for explaining some of this variance. The overarching process within the model suggested intentions directly preceded behaviour, which can be modified indirectly by attitudes, PBC and/or social norms. This study has extended the TPB model to include a 'role legitimacy' construct to possibly explain further variance in intention and thus behaviour. Role legitimacy was hypothesized to account for variations in intention based on clinicians' perceptions of their right and responsibility to intervene, and the professional boundaries governing those responsibilities in relation to alcohol-related injury. There was also an expected variance in the relative weights for each construct's influence on behavioural intention based on profession and professional subgroups.

Because the TPB constructs (with the exception of behaviour) are psychological (internalized) constructs, they represented salient information or beliefs relevant to behaviour. It is understood that people can hold multiple beliefs about any given behaviour, but they generally attend to only a fraction of these at any given time (376). These salient beliefs are understood to be the prevailing determinants of a person's intentions and actions and are thus measured as behavioural beliefs (influencing attitudes), normative beliefs (underlying determinants of social norms), control beliefs (basis for perceiving behavioural control) and role beliefs (underlying role legitimacy). Several hypotheses for this study were developed regarding the apparent relationships between these constructs, and were operationalised as part of the theory testing in this thesis. The nature of those salient beliefs was assessed by eliciting such beliefs from a representative sample of ED clinicians (Chapter 5). Guided by the proposed hypotheses, subsequent measures examined the strength and direction of relevant beliefs and the evaluation of the object of each construct relative to intention (Chapter 6).

The magnitude of the relationships between attitude, social norm, PBC, role legitimacy and intention was assumed to be dependent upon the behaviour type and circumstances

involved (405). So in situations where attitudes were strong, or social norms were very powerful, the PBC construct may have held less predictive ability of intentions or may have had a moderating effect. Thus, the relative predictive power and importance of each construct may have been occasion-specific. Evidence for this variation has been demonstrated in studies that showed differences in sociability and attitude strength and the relative predictive power of each construct (411, 413, 434). The constructs in the model have also been shown to have interactive effects as antecedents to intention (404, 435, 436). This assumption was made as well for role legitimacy. However, Ajzen and others have argued that linear models were capable of accounting for variance in psychological data even in the presence of interactive effects (405, 437). Nevertheless, it has been recommended to test potential interaction and higher order effects since first order relationship significance may be masked otherwise (438-440).

In a TPB study on cannabis use, support was found for an attitude x social norm interaction whereby the relationship between intention and attitude varied as a function of moral norm (436). Furthermore, the investigators observed a complex PBC x attitude interaction in which for (socially undesirable) behaviours that are evaluated positively, there was no relationship between PBC and intention. Otherwise, if the behaviour was evaluated as negative or neutral (attitude score at or below the mean), a negative PBC x intentions relationship was observed, suggestive of an attitude-moderated association (see Conner,1999 p217). As a hypothesized example in the current study, for those clinicians who possess negative or neutral attitudes towards persons with alcohol-related injuries, the *intention* to implement SBI whilst having high PBC (e.g. perceive a strong ability to implement) may by moderated by the aforementioned attitude. In terms of clinicians who have high PBC in general, but hold a negative evaluation (attitude) about SBI efficacy, they may express confidence in their ability to provide the intervention, but do not believe it will change the

patient's drinking outcome, therefore have reduced intention to intervene. To that effect, confidence and self-efficacy provide measures of the clinician's perception regarding ability and control of the action in question, which in turn affects the probability of implementation of the action or behaviour and perseverance in the face of challenges, and interacts with their attitude towards the patient and SBI efficacy, thus impacting the intention to intervene. Moreover, a clinician who does not endorse a legitimate role to intervene may also evaluate the efficacy of SBI as low, and is therefore less confident that they can provide ASBI despite the intention/desire to practice SBI/EBP with a patient who has an alcohol-related problem. It may be that the magnitude of the relationship between constructs is subject to interactive effects and the circumstances of the behaviour. Constructs that may have had high predictive ability in certain contexts with specific populations may not demonstrate the same association (stronger or weaker intentions) if the behaviour is evaluated differently (i.e. behaviour is socially unacceptable). The current study endeavoured to identify these complex associations within the ED context where interactions between constructs may better account for the variance in clinician behaviours that were moderated by underlying beliefs and evaluations.

3.5 Studies of ED Clinician Behavioural Intention

The importance of a public health approach to emergency medicine practice cannot be overemphasised (15, 52, 365). This approach has provided insight to the fact that many acute illnesses and injuries observed in the ED result from preventable or modifiable health behaviours, such as alcohol use and interpersonal violence. Linking the two paradigms between acute care and disease prevention can be accomplished using a conceptualisation of clinical practices that incorporates brief interventions to alleviate the substantial burden of illness and injury associated with these behaviours (61, 364).

Previous discourse on clinician behavioural intention has come largely from the general medicine domain. It is worthwhile to note that while there has been less focus within the acute care context, there are expanding areas of interest. Some discourse has covered a range of strategies regarding clinician behaviour and barriers to EBP, SBI skills training and education as well as larger domains such as organisational support for SBI practice (365). However, a very small proportion of these studies have focused exclusively on the conceptual idea of clinician behavioural intention, its theoretical antecedents and how they impact SBI practices in the ED (60, 339, 441). There has been limited explicit use of the TPB to assess attitudes and beliefs as well as perceived control among general practitioners and health care workers in relation to patient alcohol use (243, 389). More often, constructs with implicit reference to an actual theory have been used to describe provider practices associated with patient drinking behaviour (58, 191, 334, 338, 442).

Currently few studies in Australia have been conducted using an explicit theoretical framework. One study has used The Theory of Planned Behaviour to examine 'assisting' behaviour among ED nurses working with alcohol-related harms (243). Nevertheless, from the previous discussion it has been important to explore behavioural practices via 'intentions' within the broader ED population of nurses and doctors. This is because while nurses may have more direct patient interactions, doctors' influence in patient behaviour change has been methodically different from other health clinicians. In addition, doctors' reasons for not performing SBI have been inherently different from nurses and other ED staff, requiring a more explicit approach to understanding those variances (443).

There are a few relevant Australian studies that have explored the antecedents of clinician behaviour and their impact on ED-based SBI practices. For example, Indig (2009) conducted a survey of ED clinical staff (nurses and doctors) in two Sydney hospitals to explore attitudes and beliefs associated with alcohol presentations. Confidence and a sense of

role legitimacy to conduct SBI were significant indicators of 'reported' practice although a minority of staff endorsed 'actual' SBI implementation. Doctors endorsed higher levels of confidence in managing alcohol-related presentations compared to nurses although doctors more readily believed the ED was unable to assist patients whose drinking was problematic. Other studies examined confidence and mental health-related learning needs of ED staff, but were not alcohol SBI specific (264, 317, 318). None of the above mentioned studies (with the exception of the Freeman work) explicitly referenced a theoretical framework as the basis for choosing specific measures to conduct their investigation. Again, it is argued that doing so would have allowed more comprehensive analyses as well as increased the capacity to extrapolate on results associated with behavioural intention.

SBI and SBIRT strategies are similar to specialty acute care by focusing on individuals. They are also like public health prevention programs in that they seek to address alcohol problems at an early stage before dependence occurs. However, these strategies differ from acute care and prevention programs in that they are opportunistic by engaging people when they present for service in a clinical setting that is not designed for acute alcohol care or prevention treatment. In that sense, SBI and SBIRT strategies incorporate a broader definition of the problem while being more inclusive in scope. This translates into a method for effectively embracing elevated risk rather than dependence and responds to individuals typically missed by prevailing methods, resulting in a larger societal impact (444).

EDs have been well positioned as venues for screening and brief intervention in the instance of alcohol-related harms (124, 445). ED-associated trauma centres have been particularly suitable for SBIRT (3). It is therefore imperative to study ED clinician behaviour as part of the process of addressing alcohol-related injury due to the fact persons with alcohol-related problems have been more likely to seek help in the ED than primary care (446, 447). These clinicians' confidence, social norms, attitudes and beliefs regarding their

role to screen and offer brief intervention in response to ARI, have a significant impact on the quality of patient care and treatment outcomes (355). Clinician low regard in the form of negative attitudes towards ARI patients may delay further treatment-seeking as well as diminish intervention effectiveness. This is particularly problematic and undesirable, thus requiring theory-based tests of behavioural intention to clearly understand how clinician characteristics might affect their support for and current practice of SBI for ARI in the ED.

CHAPTER 4: SUMMARY, RATIONALE FOR THESIS, AND HYPOTHESES

Alcohol use has contributed substantially to the global burden of illness, disease and death and has been a leading modifiable risk factor within the categories of intentional and unintentional injury. It has been conceptually instructive to understand how multiple environmental factors such as culture, economic growth, alcohol availability, regulatory policies and health responses have contributed to the variations in historical trends of harm associated with consumption. The conceptualisation of alcohol-related injury in particular, has been an important methodological factor in developing a measurable and informed response to alcohol harms in the ED. Limitations and shortcomings in ED-specific studies have nonetheless helped to understand how these methodological factors operate, and have stimulated broader efforts to improve upon study findings and subsequent responses. Those efforts have heightened our recognition of the role alcohol consumption has played in ED presentations. For example, the study of alcohol-attributable fractions (AAF) of injury, which uses estimations of risk and rate (risk of injury when drinking and rate of alcohol use amongst injured persons), has proven indispensable for accurately calculating the overall burden of harm. Simultaneously, improved measurement has supported inferences about the efficacy of alcohol interventions in medical settings. As mentioned in section 1.2.4, RCTs and quasi-experimental designs that employed AAF measures have demonstrated improved accuracy and reliability of intervention outcomes that translated into statistically as well as clinically significant changes. Short of ED-specific systematic reviews and meta-analyses of ASBI studies, there has been equivalent research on the foundational elements of ASBI (motivational interviewing-MI) in medical settings. The practical significance of those findings suggests MI has a moderate advantage over comparison conditions with wide ranging implications for behavioural health issues (448). Global endeavours to understand the nature of alcohol risks have articulated the importance of ASBI implementation amongst ED

staff as a means of responding to the potential consequences of unaddressed alcohol-related injury presentations.

General responses to alcohol-related problems have been widespread, but research indicates inconsistent outcomes. A number of factors have been shown to contribute to the clinical response between patients seeking treatment for an ARI and the ED clinicians offering treatment. For example, attentional biases have occurred when the treatment message was perceived as potentially threatening and led to identification of personal health risks such as hazardous alcohol consumption (449). That is, people were inclined to exhibit defensiveness when presented with information that may appear to threaten their sense of integrity and self-worth, causing them to find fault in the message or shift their attention away from the discussion. Likewise, the delivery of uncomfortable or difficult information has been equally challenging and involved a complex interaction especially when it required behaviour change (326). Aspects of clinician attitude were discussed, identifying attitudes as contributing to the therapeutic alliance. Factors involved in this process, such as compassion and/or empathy are influential on treatment engagement and outcome. Empathy was posited an essential and reliable predictor of treatment success in alcohol use and thus proposed as a key therapeutic support skill to be considered as part of an EBP response. However, even when mandated as best practice, the difficulties of the interaction has often resulted in a diminished therapeutic alliance and a missed opportunity to intervene (450).

A critical review of the available Australian literature on clinician behaviour specific to EDs and alcohol use disorder resulted in the material presented in the previous chapters. The approach taken herein purposely provides a broad contextual background that incorporates social, political and cultural factors, which have been shown to influence individual professional perspectives on controversial issues such as drinking behaviour. This is due to the fact professional practices are underpinned by personal values that are often emotive and

affected by the 'moral fabric' of one's society. These influences are reflected in and actively shaped by past and current political and cultural positions. However, it appears there is a greater understanding of the influences on patient behaviour than clinician behaviour. This has been underscored by the voluminous work on patient interventions for behaviour change in a variety of health areas. Furthermore, there is limited evidence demonstrating how empathy and compassion influence clinician practices associated with alcohol interventions. It was noted for example, that while empathy is a strong predictor of treatment success, very few clinical trials have explored this process in detail. In addition, there is a paucity of clinical research has tested the relationship between clinician attitudes, therapeutic alliance, and behaviour change outcomes. These issues were elaborated upon in the first three chapters. The inclusion of the chapters on policy responses and sociocultural frameworks, used a funnel effect to refine the focus on framing and understanding the finer nuances of attitudes and beliefs that operate at the individual clinician level, prior to arriving at the theoretical perspective on clinician behaviour. Furthermore, this arrangement of the literature review supports justification of the '*a priori'* theoretical approach to exploring ED clinician behaviour, and as such, offers a logical unpacking of the complexities that influence individual and organisational behaviour and current public health responses.

For at least a proportion of the people affected by alcohol use, who might not access other treatment options even when indicated, the ED visit may be the only opportunity to address public health concerns associated with alcohol-related injury (364, 451). Furthermore, there is evidence than many people do not perceive the health risks that follow harmful alcohol consumption. This may be due to self-serving optimism or because quite simply, dichotomous models of alcohol problems (you either have the disease or you don't) reduce the perceptions of personal risk and vulnerability. Paradigm shifts over the last few decades have challenged conventional perceptions and related theories that may have limited

the range and scope of current responses with alcohol-related problems being defined on a continuum from minor to more severe as opposed to a dichotomous all or nothing diagnosis.

Unfortunately, there have been few theory-based ED studies within Australia, designed to conceptually identify the key ingredients influencing clinical encounters and ED clinician behaviour. However, extant empirical work guided by substantive theoretical frameworks has been shown to produce better models and mixed-methods designs for exploring ED clinician behavioural intention to intervene in alcohol-related injury. Such studies have also proven advantageous when direct sampling was used to assess perspectives and attributes of the provider population to explore how societal values and beliefs may have influenced the current medical response.

Chapter 3 explored and extended theoretical linkages between clinician attitudes and beliefs, social norms, perceived behavioural control, role legitimacy, and the strength of intention to intervene. Within that exploration, the Theory of Planned Behaviour was proposed as a foundation for examining the variance in behavioural intention. Evidence within the literature has demonstrated an imperfect, but reliable relationship between self-reported intention and behaviour (390). Two approaches were considered that appeared to minimise the intention-behaviour gap. Those approaches were focused on moderators and mediators of the relationship (as discussed in section 3.4.5). The moderators were more concerned with intention certainty and indirect influences such as attitudinal and normative controls. The mediator approach considered post intentional processes such as implementation intentions and perceived vs. actual control. Models of clinician attitude and behaviour were argued to measure psychological variables in the same way of any individual. However, many of these models were also predicated on the idea that the perceived consequences of one's actions would be assumed by the actor. Perceived (or actual) consequences of *clinical practice* behaviours however, were more likely to be experienced by

another person such as the patient. While these may be considered control factors in a theoretical sense, they may not be explicitly articulated by clinicians (e.g. If I provide SBI for patients with alcohol-related injury, it would reduce *their* risk of future injury). These were posited to be very powerful implicit influences (underlying beliefs) on intentions and have necessitated both qualitative and quantitative exploration of the intention-behaviour relationship in order to discern their relevance in clinical practice.

To that extent, evidence has demonstrated support for the Theory of Planned Behaviour as reliable framework for understanding clinician behaviour (389, 452). Such frameworks have also enhanced the specificity of subsequent clinician-targeted interventions particularly when integrating a mixed-methods approach (361, 453, 454). Mixed methods techniques have supported approaches for assessing and describing discrete processes involved in the implementation of evidence-based practice. The strengths of such approaches include the ability to explore the natural processes of diffusion of innovation. Other strengths involve generating findings that develop more effective methods to encourage and promote continued uptake of research into practice (455). Once considered a vexing failure among clinicians and organisations to implement the evidence, mixed-methods approaches have reintroduced the design of implementation strategies that account for environmental factors affecting adoption and implementation. A more sophisticated portrait has emerged from this approach, which characterises the implementation processes within many organisational cultures.

Mixed method designs have permitted snapshots of the experiences, perspectives and beliefs of a full range of stakeholders from policy-makers to direct practice staff and patients. Using a formative elicitation process plus deductive reasoning, mixed methods designs capitalise on the systematic integration of qualitative and quantitative data. Such designs simultaneously attempt to compensate for the shortcomings of each method's weakness while maximising their strengths (456). For example, the generalizability limitations inherent in

many qualitative studies and lack of depth typical of quantitative data have been addressed via the combined techniques of both designs. In the case of sequential, exploratory models, the collection and analysis of qualitative data has been used to inform subsequent quantitative data collection, which then can be used in a reiterative process to validate consistencies/inconsistencies in overall findings (457). This integrated approach has the potential to improve the quality as well as scientific power of the data as a means to disentangling complex relationships typical of social science data. In the process, it is anticipated that an enhanced conceptualisation of ED clinician responses to alcohol-related injury will translate into more measurable and stable reductions in overall alcohol harm. Application of the TPB has involved conducting open-ended elicitation interviews in order to identify relevant behavioural outcomes and referents for the behaviour and population of interest. In this manner, the TPB has provided the necessary framework for identifying the key behavioural, normative, control and role beliefs that collectively determined behavioural intention (376).

In short, the investigative rationale of this thesis emphasizes the fact that early recognition of, and intervention in, risky alcohol behaviours has efficacy for reducing harm related to the consequences of alcohol consumption. Alcohol screening and brief interventions, as one form of early intervention, have been associated with potentially reduced risk for future injury as well as lower health care costs, at least in some studies. Therefore, the aim of this research will be to use mixed methods (qualitative and quantitative) to examine the Australian ED response to alcohol-related injury. This is based upon the review of the literature on ARI research in chapter 1, the exploration of responses and SBI efficacy in chapter 2, and the use of the TPB as a lens to understand clinician behaviour in chapter 3, which have led to a number of hypotheses about the relationships between

constructs. An extended list of proposed hypotheses can be found in Appendix A. However, the working hypotheses to be answered in this thesis are as follows:

Thesis Hypotheses

1a. Clinician attitude/belief towards people who sustain an alcohol-related injury, will be directly related to the strength of the intent to intervene.

2a. Clinicians who perceive supervisor/peers approve (social norms) of performing SBI, in response to alcohol-related injury, are more likely to have the intention to implement this practice

3. Clinicians who believe performing SBI will reduce readmission rates to the ED, are more likely to intend to intervene with alcohol related injury.

4a. A sense of role legitimacy, as an ED professional, to intervene in alcohol-related injury, is associated with uptake of SBI practice.

5. Perceived behavioural control (self-efficacy) to perform SBI will have a moderating effect on the intention to intervene.

6. A proportion of the observed variance in behavioural intention to perform SBI, can be accounted for by perceived barriers, in the form of heavy workload, and limited resources in the ED.

7. The combined, interaction effects of attitudes, social norms, perceived behavioural control, and role legitimacy, account for a significant proportion of the explained variance in behavioural intention, to perform SBI for alcohol-related injury, amongst ED staff.

These hypotheses as they relate to the conceptual framework are depicted in figure 4.

Conceptual Framework

An adaptation from the Theory of Planned Behaviour

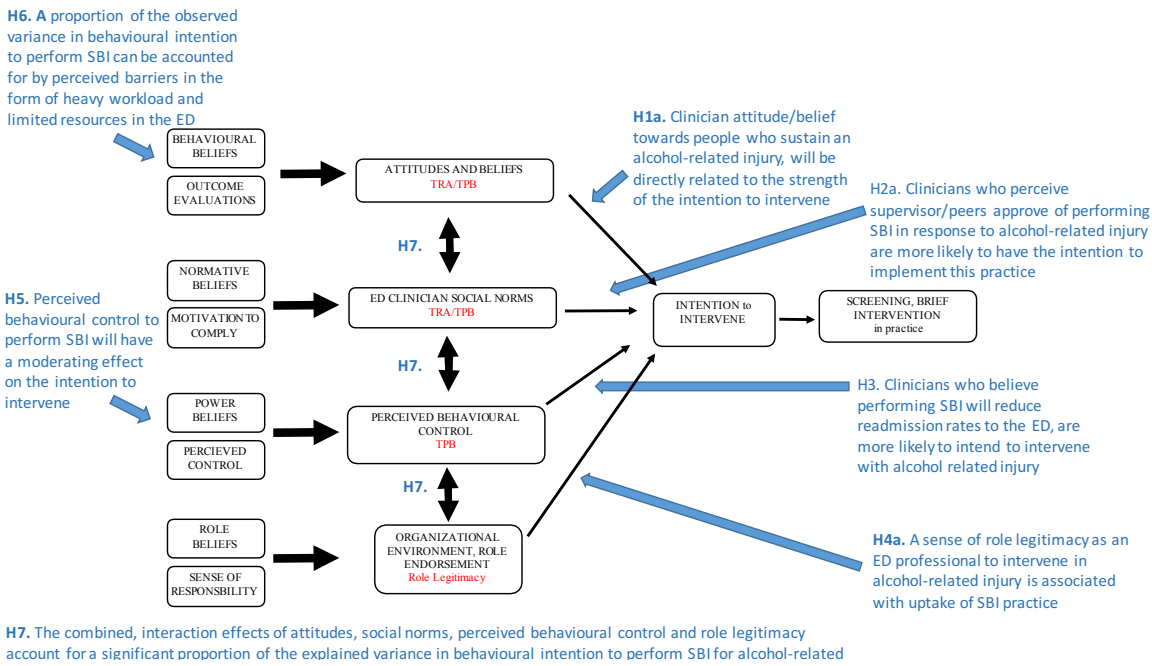


Figure 4: TPB Conceptual Framework and Hypotheses

In the next section (chapter 5), the qualitative approach utilised by this study and results of the focus groups are considered. This is to follow on with previous ethnographic work that has demonstrated deeper insight into the culture of care and practice within the ED setting (458). Therefore, this aspect of the research served a few purposes. One was to offer a clinician-group narrative that described the contextual factors impacting clinical decision-making within the ED patient-provider encounter. Another purpose was to gain a nuanced overview of the theoretical linkages associated with the perceived barriers/facilitators that have affected staff commitment and responses to alcohol-related injuries in the ED. Thirdly, this research targeted a major health problem to contextualise those theoretical constructs within the patient-provider encounter, which were unique to Australian ED clinicians. In line with the guidance for theory testing, direct and indirect (belief-based) measures were employed in a subsequent quantitative survey to more accurately capture correlational aspects

of each construct and satisfy assumptions inherent in the model (410). These assumptions dictated constructs were behaviour specific, conceptually independent, and consistently improved prediction of intentions for behaviour.

In an effort to fill in the gaps, the following chapters provide the conceptualisation and development of a mixed-methods approach, to exploring ED clinician behavioural intention to provide screening, and brief intervention for alcohol-related injury. This approach examined the linkages between clinician attitudes and beliefs towards ARI, the strength of intention to intervene, and how attributes such as social norms, a sense of role legitimacy and perceived behavioural control can explain the variance in behavioural intention to provide screening and brief interventions. The general research questions asks: "Whether the overall conceptual model, can adequately explain the observed relationships between variables"; and, "What characteristics in the ED clinician population, contribute to variations in behavioural intention to provide ASBI for alcohol-related injuries?" This effort utilised a theory-based framework from a public health perspective to improve the understanding of the intersection between patient treatment-seeking and clinician behavioural intention in the ED. This will contribute to development of a working model and robust framework for examining future clinician behavioural intention to intervene in ARI.

CHAPTER 5: QUALITATIVE COMPONENT-FOCUS GROUPS

5.1 Overview of Qualitative Project on Clinician Attitudes Towards ARI

Various factors influence the nature of patient-provider encounters such as the professional's attitude, a sense of efficacy or willingness to intervene and role legitimacy (264, 402). These factors have proven difficult to measure quantitatively, without first being conceptualised using qualitative research (199). Qualitative methods used in prior research have included ethnographic narratives, in-depth interviews, non-participant observations and focus groups (168, 200, 264, 319). These methods have required increasingly sophisticated types of data analyses to best represent attitudinal and motivational factors influencing clinical encounters (459).

Qualitative data analysis is a practical approach for deriving taxonomy, themes and theory suitable for improving health services research (460). Qualitative research in the form of focus groups has been particularly useful in refining the integral aspects of an investigation such as identifying key research questions based upon pre-existing theory or testing and extending a theoretical framework (461). Queries in health care research for example, have explored the non-systematic uptake of research findings, concluding that there was a role for theory in designing investigations to answer how behaviour change occurs in healthcare professionals (366).

In chapter 3, reviews of the international literature identified clinician-perceived barriers to uptake of ASBI and other evidence-based practices (EBP). Some of those barriers have included lack of knowledge about EBP effectiveness, lack of time, perceived threats to the patient-provider relationship, negative attitudes towards "excessive" alcohol users, and beliefs that intervening in alcohol-related issues is not part of one's professional role (200, 462). However, reviews of qualitative clinical research in the Australian ED, germane to alcohol-related injury have been limited (158, 264, 319). Nonetheless, some discussion and guidance has been provided for developing qualitative research suitable for the ED

environment (463). As such, there has been a clear need to qualify ED staff responses to ARI in order to better understand what changes could be made to improve the professional response to this growing public health problem. Recommendations from public health interest groups within the Society for Academic Emergency Medicine have advocated a structured exploration using theoretical linkages underlying the clinician behavioural aspects of a treatment encounter (61).

Qualitative methods add to the richness and expand upon the depth of what might be obtained in a quantitative exploration. For example, some ethnographic work has provided meaningful insight into the culture of care and practice that varies amongst ED settings (458). It may be that a diverse range of definitions exists within the general population in terms of what constitutes an alcohol-related injury and brief intervention. Eliciting concrete examples of the constructs of interest directly from a sample of the general population has facilitated integration of working definitions within a study. Such commonly held definitions expressed directly from professionals represents salient information and beliefs relevant to the behaviour of concern. Therefore this aspect of the research aims to address several objectives:

- To offer a social science narrative that describes the factors impacting clinical decision-making and the patient-provider encounter in the ED, in the populations' own words;
- To provide a nuanced overview of the processes by which perceived barriers/facilitators are thought to influence staff responses to alcohol-related injuries in the ED; and,
- To explore a major health problem by contextualising theoretical constructs within the patient-provider encounter which are unique to the Australian ED.

What follows is a review of the Theory of Planned Behaviour (TPB) recommendations for designing a conceptual framework that explores clinician behavioural intention. Next, the rationale for a focus group approach will be discussed followed by

procedures used in the current study and analyses conducted on the resulting data. The chapter will conclude with a discussion about the findings, limitations and elements gleaned for the development of a quantitative survey.

5.2 TPB Review and Rationale for the Elicitation Study

Theoretical frameworks provide valid and reliable means to understanding clinician behaviour (389, 452). Such means have also increased the efficiency and specificity of clinician-targeted interventions (361). As a result, consistent and accurate measurement of outputs has been achieved, particularly when incorporated in mixed-methods studies (453-455). As previously mentioned, the Theory of Planned Behaviour (TPB) has been widely cited and researched for developing behaviour change interventions in health. A paucity of studies used the TPB to explore SBI practices amongst health professionals, none of which were conducted on ED staff specifically responding to ARI in Australia.

Returning to TPB model constructs, attitudes, social norms, and perceived behavioural control were identified as immediate determinants of intention to perform behaviour. All three constructs of interest or latent variables are influenced by salient beliefs and evaluations of the outcome relative to that particular construct (refer to FIGURE 1). Because TPB constructs are psychological (internalised) concepts, belief-based measures have been required to accurately capture the correlational effects by which each belief operated on a specific behaviour. Following on from Eccles et. al, (2005) recommendations to operationalise a theoretical framework in designing health care research, the TPB was initially used herein to qualitatively identify and conceptualise underlying beliefs and indirect measures. These measures were then incorporated into a quantitative tool for broader analyses using a much larger representative sample. A qualitative approach was necessary in order to capture those underlying salient beliefs and evaluations related to the latent variables

of interest. In the process, indirect measures were identified and categorised prior to developing survey items that measured broader aspects of the same theoretical constructs.

Theoretical assumptions have suggested attitudes are determined by "readily accessible beliefs" and therefore it was reasoned that attitudes were better predicted by such beliefs as opposed to less 'readily accessible' or non-salient beliefs (426). In the current study, identification of the modal salient beliefs associated with attitudes towards ARI and ASBI was a primary focus of the qualitative component. The modal set of beliefs was identified using a content analysis of the beliefs elicited in focus group sessions. This essentially involved a frequency count of belief statements and content that were grouped together if referring to similar concepts/outcomes. If differences in content were largely semantic, then they would be considered the same and grouped together. For instance, when beliefs were elicited about 'patient responsibility for their injury while intoxicated', it was noted that some staff stated "*patients needed to be accountable*" or "*they have a choice*". In this case, both responses were grouped under the concept of "responsible" in order to reflect the salience of how staff attributed an injury to the patient's use of alcohol.

5.3 Context for Focus Group Approach

Focus groups have been used both as a stand-alone approach and in combination with surveys and other research methods to explore attitudes and behaviour. By definition, focus groups are a 'qualitative research method designed to collect data via group processes on a pre-determined topic chosen by the researcher' (464). As such, focus groups have been advantageous for capturing underlying values and beliefs associated with certain attitudes, behavioural intentions and practices. When the qualitative function of focus group is used to inform quantitative research and surveys, a range of experiences and perspectives can be distilled down into more manageable content for a questionnaire. While research with a primary focus on qualitative methods using focus groups tended to emphasise a connection

between the substantive content of "what" participants say and the interactive dynamics of "how" they say it, the substantive and practical goals/purposes of this particular program of research primarily focused on the "what" of participants' conversations (465). Therefore, the data analysis has emphasised the substantive content of the group discussions.

Focus groups have demonstrated effectiveness in gleaning richer data based on the group setting which inspires individuals to 'bounce ideas off each other', providing cues to elicit fuller views and shared perspectives on a topic (464, 466). Finally, for fiscal and time purposes, focus groups were preferred over individual interviews in order to collect data quicker at reduced costs (462). Given many ED's are often cohesive units with unique styles of staff interactions, conducting focus groups provided the potential to capture these nuances as well as unit practices, policies and culture that might have served as barriers/facilitators to SBI implementation (467). The focus group approach has been shown to provide staff the context to consider and clarify their own views in the company of peers (468). This was particularly important given the assumption that some staff may have little previous experience with formalized SBI implementation. Hence it was necessary to follow a semi-structured format for conducting the group sessions in order to systematically collect reliable data.

5.4 Procedures and Data Collection

5.4.1 Focus Group Guide Development

Initially, a focus group guide was developed according to the recommendations set out by Francis et. al, (2004), and incorporated elements from the literature review as well as theoretical constructs relevant to the substantive area of concern. That substantive area covered clinician attitudes and beliefs about ARI and ASBI in the ED and the associated barriers/facilitators. The guide consisted of 13 semi-structured, open-ended questions using cognitive probes designed to elicit discussion around attitudes and beliefs about alcohol-

related injury presentations to EDs. The guide also probed thoughts about one's ability to intervene as well as if clinicians perceived a role or sense of responsibility to engage patients in discussion about their alcohol consumption as it related to injury (refer to APPENDIX for list of questions).

The focus group guide was developed to assess current perceptions about alcohol-related care practices based on the potential for there to be discrete barriers/facilitators to screening and brief intervention. This also permitted monitoring of discussions and topics that may have been unique to either screening or brief intervention. The questions were general enough to stimulate conversation but focused to the point of eliciting personal beliefs and ideas from a professional perspective. In order to understand whether these perceptions were relevant to Australian ED clinicians, purposive sampling directly from the population was required. Overcoming barriers to staff recruitment has not been written about extensively in the Australian context, but some important strategies have been reported elsewhere and incorporated in the current study (469).

5.4.2 Focus Group Recruitment

Requests for focus group participation were advertised via internal email from department managers and nurse educators, signage placed in ED staff break rooms and on message boards, and/or through word of mouth. Inclusion criteria comprised being an ED clinician (doctor, nurse or allied health) who provided direct patient care in a full- or part-time capacity. Three focus groups with ED staff (primarily doctors and nurses) were conducted between March-August 2014 at three level 1-2 trauma hospitals in NSW. Directors and managers were excluded from the general staff focus groups due to their substantially different roles and responsibilities as well as their potential to bias junior staff responses.

Focus Group Processes

1. Upon arrival, participants were provided a copy of the informed consent letter which signified their arrival for the group represented implied consent and were free to cease participation at any time. They were then asked to complete a short (5-7-minute) anonymous sociodemographic questionnaire which was collected at the end of the session. All sessions were held within the respective emergency departments of each hospital.

2. At the beginning of each group, (and if required during the group) the confidential nature of the session was reinforced with clarifying reminders. For example, participants were encouraged to speak in the third person to ensure sensitivity around personal/ethical issues-that is, to avoid identification of specific individuals, whether they were staff or patients. These reminders served to reduce disclosure of personally threatening or intimidating information while at the same time promoting open participation. Participants were informed that all proceedings were digitally recorded. The informed consent/participant information letter also included the details of ethics approval and contact details of the local governance committee. Ethics approval for this aspect of the research was obtained from Curtin University Human Research Ethics Committee (HREC) and the South Eastern Sydney Local Health District HREC.

3. A 2-minute summary of the research project was provided to enhance awareness around alcohol-related injury in the ED and thereafter, attendees were engaged in focus group discussion. The researcher moderated the focus groups and approximately 8-9 staff participated in each group. One group (8 participants) was part of an in-service session normally set aside for a Drug and Alcohol education session. The other two groups (9 participants each) involved a voluntary/self-selected option to attend the session between in-service seminars on a pre-schedule training day. The moderator was trained as a clinical social worker and had experience in group dynamics across a variety of settings.

4. Questions were visually presented one at a time via MS PowerPoint slides and simultaneously read aloud by the moderator. Written prompts were also available under each core question and shown only if participants either verbally requested clarification or remained non-verbal after the core question was presented. Focus groups lasted on average 60-70-minutes, were semi-structured in nature, and elicited key issues such as existing attitudes and beliefs about patient alcohol use, its perceived relation to injury presentations, normative practices for ARI, etc. Further issues probed current behaviours in relation to alcohol-related injuries and queried staff awareness and attitudes about existing alcohol screening and brief intervention guidelines for alcohol presentations and factors that underpin these. The questions and procedures were applied in a standardised manner across all three groups.

5. Staff were asked who they identified as opinion leaders in their professional network, tapping into normative beliefs. To assess experiential behavioural controls, staff were queried on how easy it would be to use/implement SBI, whether it was perceived as worthwhile, and challenges or problems associated with use of an SBI guideline. The remainder of the semi-structured issues tapped into beliefs around sense of responsibility to intervene and who they believed was best positioned in their role to perform SBI. It was anticipated themes would emerge that were central to attitudinal and normative beliefs, role legitimacy, as well as control beliefs and motivation to comply (salient beliefs and evaluations of the outcomes of performing the behaviour).

6. It was recognised that staff may not always be willing to discuss all issues in a group format. Therefore, participants were offered the option to discuss viewpoints and perspectives in a one to one discussion with the moderator outside the focus group. No one took up this option. Refreshments were served during groups and participants were compensated for their time by entry into a random gift draw with a 1/5 chance of winning a

designated prize (a $100 gift voucher). Funding for this portion of the project was provided through a research grant internally available to the researcher.

5.5 Results

5.5.1 Sample Demographics

Basic descriptive statistics were conducted on the demographic data provided by the 26 participants. A large majority (80%, n=21) were less than 40 years of age, and more than half (n=15) were female. One group was composed solely of nurses, one group solely of doctors and the third group was a mix of both professions. No social workers participated in the focus groups due to scheduling and logistical reasons. Two-thirds of the sample (total from all three groups) was composed of participants who identified with a nursing background (Table 1). Combined data from all three groups indicated the majority of participants (85%) worked on average 38+ hours per week, and exactly half had worked in the ED five years or less (Table 2). Most reported no training in alcohol screening (80%) nor alcohol brief interventions (77%). However, during the discussions medical doctors were more likely than nurses to demonstrate a broader understanding of ASBI (Table 3).

Table 1: Personal characteristics of ED staff participating in focus groups

Characteristic	n	(%)
Age Group		
20-29 years	11	42.3
30-39 years	10	38.5
40-49 years	3	11.5
60-69 years	1	3.8
Gender		
male	11	42.3
female	15	57.7
Profession		
doctor	10	38.5
nurse	16	61.5

Table 2: Work characteristics of ED staff participating in focus groups

Characteristic	n	(%)
Avg. Hours Worked/Week		
0-20 hrs	2	7.7
21-37 hrs	2	7.7
38+	22	84.6
Avg. Shift Worked		
AM	9	34.6
EVE	13	50.0
PM	4	15.4
Years Worked in ED		
0-5 yrs	13	50.0
6-10 yrs	4	15.4
11-20 yrs	5	19.2
21-40 yrs	4	15.4

Participants were asked to self-report on their own alcohol consumption in the last year. This question was included as prior research has suggested clinician perspectives on intervening could be influenced by their own health behaviours related to the issue of concern (140, 470). Specifically, respondents were asked "when was the last occasion you consumed 3+ standard servings of alcohol?" Just under 40% reported consuming more than three standard drinks in the last week. The remaining proportion of respondents was distributed over five 'less recent' categories of occasions (Table 4). The three standard drinks reference was used in line with NHMRC guidelines, which suggest reduced risk of chronic harms calls for no more than two standard drinks per occasion.

Table 3: SBI training for ED staff participating in focus groups

Training	n	(%)
Alcohol screening		
yes	5	19.2
no	21	80.8
Alcohol brief intervention		
yes	6	23.1
no	20	76.9

Table 4: Last occasion of 3+ standard servings of alcohol

Occasion	n	(%)
less than a week	10	38.5
less than 30 days	4	15.4
less than 6 months	5	19.2
more than 6 months	4	15.4
N/A	3	11.5

5.5.2 Content Analysis

Data analysis for the focus group discussions were conducted using content analysis with a predetermined objective to identify facilitators and obstacles to implementation of SBI for ARI. The analysis required an inductive approach that involved familiarisation with transcribed data, the identification of key issues related to the theoretical framework, systematically indexing concepts, charting the data according to the TPB framework, and then mapping concepts by arranging them in a relational manner as developed in previous work (471, 472).

Qualitative content analysis (often referred to as simply "content analysis") comprises the extraction of information from its original context and processes that may have produced that text. This approach has not been established in any formal canon per se, but the core idea has been commonly employed as a qualitative approach for developing a set of categories beforehand (471). Qualitative methods have been argued as distinct from quantitative methods. However content analysis is the only method with a "mirror image" in the quantitative world (471). Originally developed to analyse volumes of related texts in mass media, content analysis systematically counted 'text categories' and subjected the results to statistical analyses (473).

A theory-guided approach complimented the current analysis by providing categories *ex ante,* in order to guide data collection. It also allowed a linkage between research questions and the raw data. For instance, the procedure began with a theoretically derived set of modifiable categories that were amenable to changes based upon the unique qualities of the current sample. These categories were reviewed and assessed in light of the extant empirical evidence that validated the relevance to the larger population. This approach offered a conceptual framework representing latent variables and assumptions inherent to the processes of behavioural intention and clinical decision-making. These processes contained details of the relationships between variables and their impact on outcomes of interest, (viz., behavioural intention to respond to ARI; see for a schematic view of this process as adapted from Glaser & Laudel, 2013).

Focus group discussions were digitally recorded and manually transcribed verbatim using content analysis to identify patterns and recurring themes (474). The final themes were derived from general statements that described the experiences of staff. These themes emphasized recurrent and conceptually unifying ideas that emerged throughout discussions. Transcription involved listening repeatedly to conversations in order to 'distill' key ideas and

after developing a hard copy of all conversations, manually locating and categorising relevant concepts and themes from the text (459, 475). A modified phenomenological approach was employed with the aim of deriving knowledge about staff experiences in a descriptive rather than explanatory manner. The analysis mirrored the four steps proposed by Beich (2002): establish themes for coding categories; use classification for units of meaning; abstract and condense; and synthesise into consistent statements and categories.

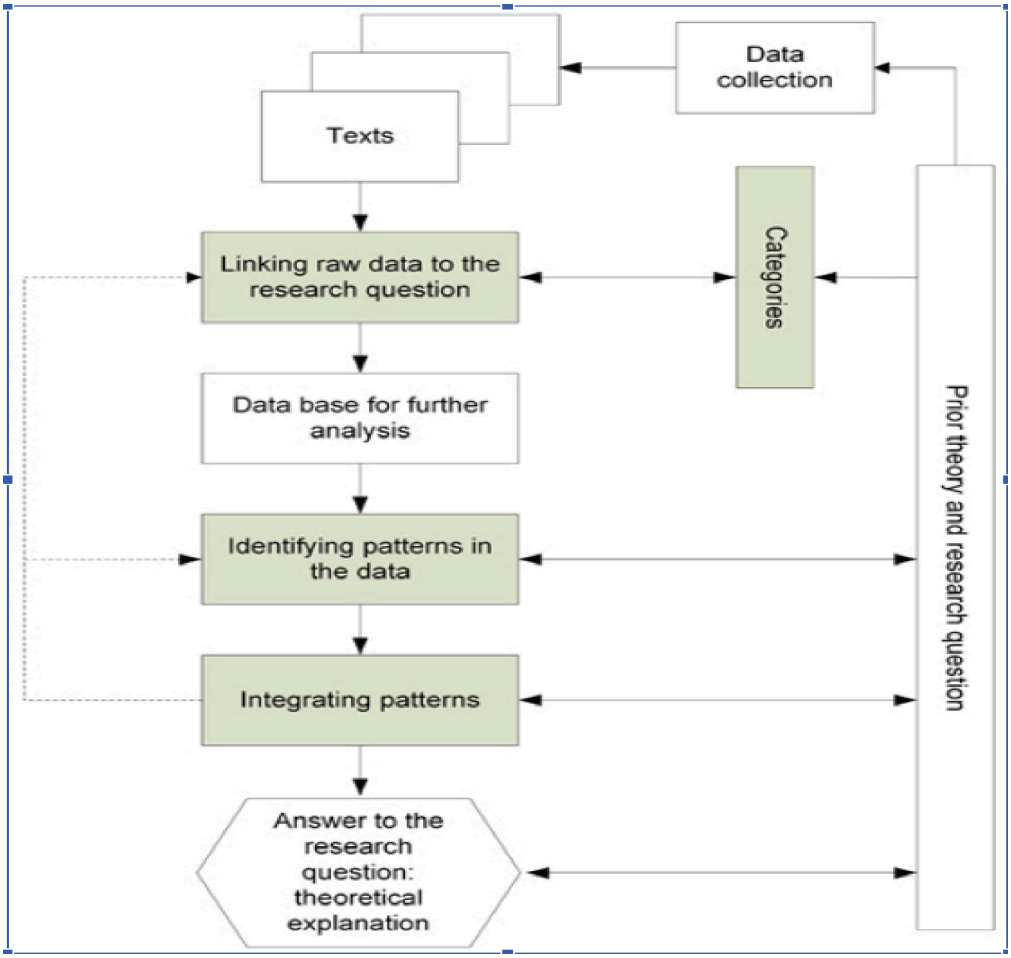


Figure 5 Schematic process of theory-guided analysis (Glaser & Laudel, 2013)

The process of data and theme analysis was iterative, recursive, and dynamic (476). Statements were reduced to common themes and conceptualisation of meanings congruent with the TPB model. An inherent function of the qualitative approach was to integrate

inductive and deductive reasoning for hypotheses testing and as a preface for subsequent survey development. From an inductive standpoint, all themes were derived from collected data. Broad conclusions were then generated based upon specific observations to inform quantitative data collection. In terms of deductive reasoning, the investigation was designed to identify those specific factors that may have enhanced or deterred SBI implementation in the ED setting. Explicitly, this mode of analysis assumed that all potential facilitators and barriers to implementation were real and may have varied according to either component (i.e. screening or brief intervention). Analyses were designed to provide insight into staff beliefs and feelings associated with the presentation of an alcohol-related injury and how this may have impacted the ability to respond.

5.5.3 Concept Mapping

A frequency count of themes and terms guided the categorising of properties and dimensions of concepts, and subcategories were formed where appropriate (462). The frequency of relevant terms in the discussions was dominated by attitude, followed by PBC, role legitimacy and then social norms. Emergent analytical themes were identified to the point of theoretical saturation. Saturation is the point at which no new themes, dimensions, or relationships emerge from the data (477, 478). While much of the literature suggests several groups (~4-7) are needed to reach this point, saturation was modestly achieved via the three groups available.

Concept mapping has been used to summarise interview transcripts by enhancing the transparency of underlying cognitive patterns and categories that may be related by the set of propositions inherent in a theoretical model (479-481). A visual representation using combined data from all three focus groups was developed to highlight those patterns and concepts identified as salient beliefs from the theoretical framework. The resulting text and conceptual ideas gleaned from this process are illustrated in figure 6.

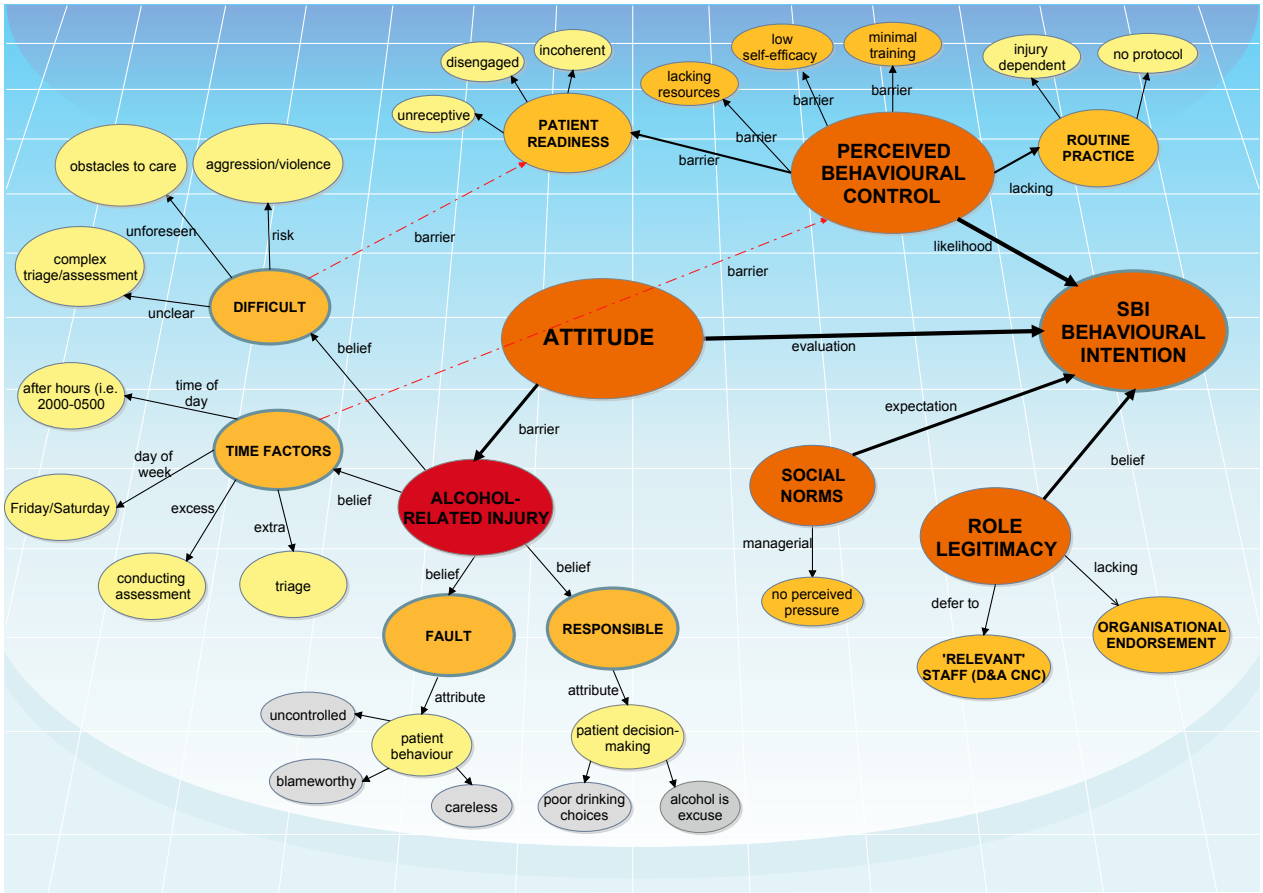


Figure 6 Thematic Concept Map-Focus Groups

The four thematic categories identified were consistent with the TPB model and with the added construct of role legitimacy (orange ovals). Attitude, social norms, perceived behavioural control, and role legitimacy were categorised as is to maintain consistency with constructs from the proposed theoretical framework. SBI behavioural intention represented the latent variable behavioural intention from the model (orange oval). Alcohol-related injury (red oval) was included in the conceptual map as a dimensional target of attitude with subcategories (difficult, time factors, fault and responsible) to illustrate specific properties of attitude that emerged during discussions.

Attitude was the prevailing category throughout the analyses and its relationship with ARI generated four non-discrete subcategories reflecting underlying beliefs of staff. For

example, when asked whether ARIs were easy or difficult to respond to, many clinicians suggested the aggressive and violent nature of some intoxicated patients negatively impacted the ease of responding. Time factor was a common theme related to attitude, and represented aspects such as 'the time of day ARIs were likely to present/occur' as well as 'how ARIs are perceived to require extra time and consideration'. Clinician beliefs about attributes of patients' 'responsibility' for ARIs reflected a sense of 'poor decision-making' or that alcohol was used as an 'excuse' for the incident. Staff also attributed a degree of fault to patients who were injured as a result of their own drinking, suggesting the patient's behaviour was 'careless or uncontrolled'.

Questions underlying perceived ability to respond to ARI elicited discussions that revolved around 'patient readiness' to receive a brief intervention and were conceptualised accordingly. PBC emerged during queries about ASBI policies or departmental protocol for responding to ARI and was linked to 'routine practice'. In addition, participants described a lack of resources and little training when asked if they believed they had the ability to provide ASBI (by discussing drinking practices with injured patients). Therefore, these emergent themes were coded and categorised in relation to PBC. Subcategories for patient readiness and routine practice were also developed to represent smaller elements that impacted PBC as an antecedent to SBI behavioural intention.

Role legitimacy (RL) was recurrently associated with themes such as seeking 'organisational endorsement' or 'refer to relevant staff' (i.e. drug and alcohol clinical nurse consultant- D&A CNC'), denoting a vacillating sense of responsibility in the context of responding to ARI. Therefore, a bi-directional relationship between RL and those two sub-categories was proposed. Social norms, which represented the perceived expectation of others upon the clinician, did not emerge substantially as a markedly important factor within this context. That is, many clinicians expressed little or no sense of pressure to respond to ARI in

any particular way. Nor was there a strong sense of a collegial, managerial, or institutional expectation to use SBI as a means of managing ARI. Thus, no subcategories or related factors are represented to highlight relationships with this construct.

5.6 Discussion

This qualitative investigation explored ED clinician responses to alcohol-related injury. It also explored factors within a theoretical framework that have been proposed to explain facilitators and barriers to implementing alcohol screening and brief interventions. Consistent with previously obtained results, a relationship emerged from group narratives linking clinician attitudes, ARI and patient attributes (58, 138, 161). Clinician PBC appeared to have an association with perceived ability to allocate time to provide ASBI. General themes and patterns emerged from the data that were related to theoretical constructs; attitudes, beliefs, perceived behavioural control and a sense of role legitimacy to intervene in ARI cases/presentations. While it was expected that qualitative content analysis using an ex ante approach would generate the observed phenomena, an integrated form of inductive/deductive reasoning balanced the methodology and limited biased/forced observations. Notwithstanding, emergent themes and patterns have resonated with extant literature. As such, focus group data supported the development of the second project's questionnaire by providing categories for measuring the correlational aspects of theoretical constructs as they related to behavioural intention. In the following discussion, explicit and implicit connections gleaned from the data will be used to describe the relationship between ARI, SBI and the aforementioned theoretical constructs.

5.6.1 Attitude

"Time" and "difficult" were amongst the two most common reference terms used by clinicians to describe the perceived relationship between injury and alcohol consumption. Staff spoke about connections between injury and alcohol in terms of triage and assessment

challenges and the complexity of a presentation when a patient has been exposed to alcohol. For example, one clinician referred to the 'connection' as problematic because such cases were not straightforward and involved obstacles to care;

> *"…and like when alcohol is involved, it's hard to see whether it's the effect of the injury or the effect of the alcohol that's leading to what they're presenting with."*

Two clinicians noted:

> *"it's quite frustrating when they come in like that, they say I'm okay, I'm all fine...those are the hardest ones to assess". (Clinician 1) "There's also more difficulty getting history from patients as well…more to investigate…and they also stay in the department a lot longer than other patients". (Clinician 2)*

In general, clinicians felt that injured patients who (may) have alcohol on board presented additional challenges to the overall presentation and treatment requirements. A comment from a participant in another group included:

> *"If I hear someone's coming and they go, 'oh they're under the influence of alcohol', I immediately just let out a sigh, 'cause you know it's gonna [sic] be, not every time, but as a rule, it's gonna [sic] be challenging to do anything".*

Time was a significant factor perceived in the connection of injuries and alcohol-related presentations. It seemed to staff ARIs were most common after hours or on weekends. A doctor related:

> *"Well, certainly it depends on what time we see them come in…often late at night or on the weekends, the probability is likely the waiting room is more full of people who have problems around drinking and have fallen over or gotten into a fight, done something bit unusual and end up as an injury…so Saturday night Friday night or something…".*

The second question of the questionnaire guide queried 'how responsible did clinicians think people were for injury when it occurs under the influence of alcohol'. Two categories emerged in this instance proposing implicit beliefs of 'fault' and 'responsibility' attributed to patient behaviour. Blame of an offender in this regard was counterbalanced by the idea of

compassion for those not at fault, but who were injured as a result of someone else's drinking. For instance, two group members noted;

> *"I think it's probably considered much more unacceptable when someone else is hurt as opposed to someone who has been drinking and injured himself". (Clinician 1)*
> *"Yeah, the drunk driver goes off the road and kills a bystander is frowned upon much more than someone else who got stabbed, or punched or king hit when they were drunk". (Clinician 2)*

Some clinicians provided a belief-based evaluation of patient responsibility for ARI by suggesting 'patients need to be accountable/remorseful for their actions'. Two clinicians in dialogue stated:

> *"People just frequently underplay how much they've drunk or feel the amount they drank doesn't play a role 'cause they've only had two drinks…causing a problem" (Clinician 1)"…And they didn't hurt their hand last week when they drank a six pack so it's not necessarily related". (Clinician 2)*

These underlying attitudinal beliefs were further supported by statements implicitly evaluating patient behaviour as blameworthy, careless and involving poor drinking choices.

While there was unanimous agreement that medical attention was warranted for injury cases resulting from a person's own drinking, there was a tendency for discussions in this regard to revolve around difficulty in delivering that medical attention. One nurse reported:

> *"I had a patient two weeks ago who was youngish, ~39 and fell over drunk, found on the footpath, voiding and vomit all over himself and he had a laceration on his elbow and they needed someone to do the dressings and I spent so much time trying not to get vomit on me…you just spend less time on other things than you should because you're trying not to get vomit on you…it's disgusting…obviously I still treated his injuries but the priorities change a bit".*

These discussions tapping on attitudes revealed an array of underlying beliefs and evaluations held by clinicians in relation to ARI and its impact on intentions to respond or intervene. The data suggested that while there were explicit views about ARI, implicitly held beliefs may have had a similar influence on attitudes. This was demonstrated through comments that revolved around themes of time, difficulty and attributes of patient responsibility and fault in relation to ARI.

Questions querying thoughts around 'responding/intervening with people in terms of their drinking behaviours' generated comments about patients' unwillingness or lack of receptivity to discuss drinking because the patient was too intoxicated. Concerns were also expressed that intervening at this point would have been perceived by the patient as intruding leading to disengagement. Clinicians therefore felt such interventions were only appropriate if the patient was 'proactively seeking help for alcohol'. The responses expressed during this query seemed to demonstrate a complex correlation between PBC and role legitimacy. For instance, one clinician mentioned:

> *"I guess in one way as well we see them at their worse-they're intoxicated, they're not really gonna [sic] listen to us say 'no you shouldn't drink this much'...we discharge them when they're sober not when they're drunk...yeah I probably wouldn't say to someone 'well maybe next time before you go out drinking you should stop after two drinks', like I don't really think that's my place to".*

In this example, the clinician initially identifies aspects of the patient-provider encounter that may not be amenable to a conversation about alcohol consumption due to the condition of the patient. After proposing statements that would formulate part of a brief intervention, the clinician concludes this would not be part of their role. Thus while there was some discussion of the hypothesised patient response impacting clinician self-efficacy, there was also the focus on distinguishing role legitimacy and responsibility to intervene. In another instance, a staff member stated:

> *"Given time constraints in the ED, it's hard to set aside some time to do that counselling…it's much easier to say if you think it needs to be done, call up drug and alcohol and just leave it to someone else to do".*

This staff member appeared to indicate they would be more inclined to refer ARI cases to alcohol and drug specialists in lieu of performing ASBI, partly because of time factors and also because they didn't perceive the efficacy and role for themselves. Short stays and patient preparedness/readiness were also commonly described beliefs elicited during this part of the discussion as reported by two clinicians:

"Most people you see in the emergency department are acutely…I mean they're drunk so they're not particularly interested in interacting over their drinking behaviours or reflecting on it". (clinician 1) "And then they stay in emergency short stays, not that kind that you can do counselling and if they've been drinking for so long, sitting with them for two hours and giving them information won't help them so they need more time and to bring them to the drug and alcohol services could be an option". (Clinician 2)

Attitudes and beliefs towards SBI were characteristic of the two endpoints on a continuum of responses in terms of what participants knew about SBI. For example, some doctors at one hospital appeared to possess more in-depth knowledge not only of SBI in practice, but also the research related to SBI efficacy in certain clinical settings. Nurses on average reported little to no knowledge or understanding of SBI as EBP. As quoted in the above dialogue, some believed any 'effective' intervention would require at least "two hours" and even then, the certainty of effectiveness was questionable. However, there were some doctors who were not as knowledgeable of ASBI and a few nurse educators who were familiar with this practice and knew of its applications outside Australia.

In general, the thematic category of attitude appeared to adequately capture the nuances of clinician underlying beliefs about ARI and SBI. Categorically, these beliefs were explicitly and implicitly expressed, supporting the reasoned action approach that attitudes are composed of salient beliefs and outcome evaluations. These readily accessible beliefs were modally identified after cognitive probes were introduced through group discussion format. Perceived barriers to 'effective intervening' included time and case complexity, evaluations that SBI did not have an effect, and patient attributes such as aggressiveness and incoherence. These constructs emerged in the form of underlying or indirect beliefs about behavioural intention to intervene in alcohol-related injury, further supporting theoretical assumptions within the conceptual framework.

5.6.2 Social Norms

Contextually, social norms was a weaker category as there were fewer elicited responses. This may have been a substantive (artefactual) result of how the questions were designed. It may also be associated with the fact that in general/actuality, there were no fixed expectations to perform screening or brief intervention for ARI presentations in any of the EDs sampled. This was supported by staff comments in relation to the question "Are there any people or groups in your professional network most likely to support you responding/intervening?" In all groups the typical opening response was 'drug and alcohol services' would be supportive of ED staff responding and intervening in alcohol related cases. However, there was no explicit mention of organisational bodies or endorsements, nor views that managers and directors would expect staff to formally provide ASBI. Responses to the expectation questions were minimal and exemplified by one staff:

> *"Do we have expectations?" The biggest expectation is be safe with the patient and that may not require an intervention from a D&A (Drug and Alcohol) perspective to get them safe for the next 24 hours".*

In terms of responding to the question "How important is it for you to comply with supervisor expectations to respond/intervene?", one response was:

> *"It depends on who you mean for supervisor…supervisor could just be the staff specialist that is on for that day, but the supervisor for what…governing bodies or what? In theory we should be doing it but whether we are actually doing it or not, I don't know".*

Thus, social norms, which represented the perceived expectation of others upon the clinician, did not emerge substantially as a very important factor within this context. When asked for example, what they perceived important others think in terms of their own response to ARI, most clinicians did not explicitly identify anyone in particular. Some assumed their manager might have a general expectation, but there was no elicited response indicating an expectation to 'respond to ARI' or an expectation to routinely use SBI in the ED. In addition,

thoughts regarding the importance to with comply with supervisor expectations to respond/intervene in ARI generated no additional responses suggestive of an existing supervisory expectation in the hospitals sampled. These findings were also consistent with the literature which suggest intentions based upon attitudes are a better behavioural predictor than intentions based upon social norms (406, 411).

5.6.3 Perceived Behavioural Control (PBC)

Perceived behavioural control as a thematic category appeared to adequately represent participants' sense of control over intervening in alcohol-related injuries and was indirectly related to time factors. Overall, there was unanimous agreement on the belief that ARIs were harder to manage/engage. As an example, when asked whether ARIs were easy or difficult to respond to, many clinicians suggested the aggressive and violent nature of some intoxicated patients negatively impacted the ease of responding:

> *"What I think it (alcohol) does is bring out someone's personality; that alcohol brings out something that's in them already. Like if they're an aggressive person but when they do not have alcohol, they can kind of control that, but when they've got alcohol, there's nothing controlling that…".*

A particularly relevant comment made by one staff addressed the sense of efficacy in relation to impacting future patient drinking behaviour:

> *"I think it's hard as well if you don't foresee having an ongoing relationship with this person…it's not really appropriate to sort of take on the role…it's much easier to say okay write a letter to the GP suggest counselling for alcohol 'cause they need to monitor whether its effective or not".*

This quotation illustrated the transient nature of the personal relationship with the ED patient; the requirement of an investment in a future behaviour which is beyond purview/monitoring capacity of an infrequent ED visit. On a similar note, one nurse reported a lack of confidence in the skill to enhance readiness for change in a patient's drinking behaviour:

"I don't feel like I am equipped with the sort of, the speech and what I would say to tell people 'you know you shouldn't drink that much on the weekend,' and they'd say 'why is it bad?' I don't feel like I could just go da da da, there you're convinced…you know we haven't had the training to be able to sort of advise people like that".

Belief in the efficacy of SBI or intervening itself was explicitly questioned by some staff, highlighting low awareness of the current evidence base:

"…some sort of medical caring relationship would be a position to provide advice. Whether or not it is helpful or listened to or otherwise is another thing". (Clinician 1)
"We also have a very transient relationship with the patients. We're not going to see them again, we're not going to follow them up, how they're going or whether they're drinking…you know we can give advice hand out a leaflet, whether or not they take the leaflet home is another story and certainly whether they read it or not". (Clinician 2)

In terms of finding justification for responding to ARI, it appeared many staff relied upon past experience as an indicator of future success. That is, some clinicians felt they had limited intervention experiences involving a "positive" outcome and therefore felt unable to effect change. On other occasions, it seemed the encounter was less of an 'opportunistic' scenario and more related to a planned presentation that was alcohol specific. One clinician suggested:

"I can only think of a few times where I've asked someone 'now have you ever thought of stopping drinking or not drinking so much' and they were more people who come in because of their drinking not because they've been injured by their drinking".

In a question regarding 'how are alcohol-related injuries typically responded to' the general consensus was that no routine protocol existed. Staff suggested there was an injury-dependent set of guidelines for managing the case overall, but in terms of addressing aspects of alcohol consumption in relation to injury, they were not aware of routine or standard guidance. Conversations in this instance resorted back to the challenges (added responsibility) of managing the behavioural manifestations of intoxication.

Overall as a thematic category, PBC seemed to adequately characterise participants' sense of control over intervening in alcohol-related injuries and it appeared to be affected by

time related factors. Alongside the category of PBC, some interesting parallels and relationships emerged about self-efficacy and sense of role legitimacy. In addition, and most likely as an indirect outcome expectancy, many clinicians assumed the effect of responding was not productive. This assumption was based upon a lack of knowledge regarding outcomes from previous attempts to intervene with intoxicated patients. It was at this point many concluded it was almost futile to do anything further to address patient drinking behaviours. Some staff offered justification to intervene in cases where the patient purposely presented for issues directly related to alcohol. This was distinguished from cases where the injury was implicitly due to alcohol, at which point clinicians reportedly deferred any form of opportunistic intervention. These parallels have required model testing in order to determine whether they represent unique relationships or co-exist along similar pathways. In particular, a quantitative approach has been proposed to provide further insight as to whether role legitimacy was better explained by PBC or if it was best represented as a separate construct.

5.6.4 Role Legitimacy (RL)

Representative of clinicians' perceived limits of professional responsibility and rights to intervene, RL appeared to be impacted by organisational endorsement, and simultaneously associated with the tendency to defer to another "relevant" role within the organisation. That is, while respondents felt it was important to have support from their respective institutions or organisations to legitimately respond to ARI (by performing SBI), there was a tendency during conversations to suggest the norm was to defer that responsibility to drug and alcohol staff. In fact, some clinicians held a very strong belief that responding to ARI was a domain specifically for public health epidemiologists and researchers and not at all within the role of ED staff:

> *"That falls into the category of public health measures and I have to say I don't think it's my role, it's not my job to be an epidemiologist and a public health scientist… There are people who do that and good luck to them, but that's not what I do".*

In terms of one's role to intervene, perceptions of role responsibility differed to some degree between nurses and doctors. For example, in the doctors-only group, responses to the question, "What are your thoughts about your role/responsibility to intervene/respond?", focused on individual expectations to provide advice and assume responsibility for intervening. Some doctors suggested an interdisciplinary responsibility:

> *"Yeah anyone really who has an interaction with the patient-when I say us, I mean medical whether that is nursing or doctors, but anyone who is seeing the patient in the department…".*

Whereas, in the nurses-only group there were moderately decisive responses:

> *"I think it's a medical responsibility too, to be having that chat because they're (doctors) diagnosing the patient with whatever condition and treating them…".*

In some instances, both professions agreed there was a collective responsibility amongst staff. Nevertheless, an implicit theme was how to determine who would be best positioned to intervene in any given case:

> *"But who's best positioned yeah, anyone who has contact with them absolutely and some sort of medical caring relationship would be a good position to provide advice…".*

This latter comment points out the need for more discrete measures of staff perceptions in relation to expectations they may have for each other. For example, some studies have measured expectations of doctors about nurses to intervene in ARI using ASBI and vice versa (443). Case in point, in a previous study almost 40% of clinicians expressed uncertainty about an ED role for addressing alcohol-related problems (58). Furthermore, less than 33% of doctors and 40% of nurses endorsed the belief that they had responsibility to conduct a brief intervention for alcohol, indicating a discrepancy between the two professionals as well as noting the low expectation amongst ED staff in general.

5.6.5 Behavioural Intention

The final guideline questions focused on circumstances when staff thought it would be appropriate to conduct screening or brief interventions for patient drinking behaviours in an ARI. Theoretically, this set of query elicited discussion about intentions related to performing SBI. In response to questions about 'when staff thought it was appropriate or inappropriate to screen for 'at-risk' drinking or provide simple advice for an alcohol-related injury', some clinicians responded:

> *"It can be awkward but not really inappropriate, but by just asking those four questions can be awkward to ask someone that you might not feel it applies to…"*

In this response, the clinician appeared to express some discomfort in formal ASBI implementation which could have been interpreted as a low likelihood of behavioural intention. One nurse noted:

> *"But still people like me who don't drink who don't know the different brands, different amounts, like standard drink I know is 30mls but sometimes I see people at triage saying they had this much or…so that sort of changes..."*

There was general agreement that an appropriate time to intend an intervention would be when the patient was awake and sober. However, there was very limited explicit indication that staff would implement an intervention or screening otherwise. However, one clinician did comment:

> *"I said there needs to be some research showing it actually works because I'd be happy to do it if it did work, but some of the times you feel that it's just not working…".*

Clinicians discussed options and factors associated with universal vs. selective screening while noting that general alcohol screening can be role dependent, for example as a triage nurse. Staff agreed that while it was not uncommon for the triage nurse to ask alcohol-related questions, there was no universally routine practice across hospitals. As another

example, if the patient had a chemical overdose, screening for alcohol would be implemented. If the patient was significantly and obviously intoxicated then a BAC might be requested. On rare occasions when Drug and Alcohol Services are consulted, a standardised instrument such as the AUDIT would be administered to assist with that consultation. However, no groups reported routine implementation of alcohol screening, nor was there a consensus of practice across hospitals. This in essence suggested there was low impetus for behavioural intention to formally perform SBI in most circumstances. Intoxication reportedly served as a barrier to providing a brief intervention, which was often deferred until the patient was sober. In the latter case, it was mentioned that patients often discharged after getting sober without formal ASBI due to time constraints and/or bed availability-the clinicians simply moved on to the next emergency demand. In terms of knowledge of ASBI, those doctors who were trained/practiced medicine outside of Australia shared their experiences of implementation abroad and discussed efficacy implications. Many nurses on average endorsed minimal detailed knowledge of BI, while a few senior nurses or nurse educators appeared to have a broader understanding. Overall, there was an expressed willingness to learn more about ASBI as a tool to enhance service delivery and reduce the impact of ARI on ED workload. In short, there was low endorsement of intention to perform screening and brief intervention in a substantial variety of contexts.

5.7 Limitations

There were several limitations within this study related to design and methodology that have implications for subsequent conclusions. The first is sample bias, which is an inherent consideration in focus group designs. Participant selection in this regard was more focused on minimising that bias rather than achieving generalizability. Thus, a purposive selection process was used to recruit participants in order to obtain a shared perspective and generate meaningful discussion on the research topic. That is, recruitment reflected a theoretical

preference to preserve group dynamics that would arise from homogeneity; which by definition, conceded random sampling principles (482). As practical considerations restricted the ideal of continued interviewing until theoretical saturation was achieved, the modest number of focus groups may have impacted on the content validity of the responses to the research questions. Though emerged patterns did not explicitly suggest additional data were needed, it was possible that having only three focus groups limited the certainty of reaching true theoretical saturation. A basic rule of thumb suggested three to five groups may be adequate and more than this seldom provides meaningfully new insight (482). However, this project achieved the lower end of that range, reducing confidence of having captured all significant ideas in the larger population of ED staff. Nevertheless, the data did corroborate findings from previous qualitative work related to clinician behavioural intention to perform SBI. That being said, recurrent themes and ideas were common across all groups and with small exception, as there were few unique concepts or ideas emerging from later groups. One unique concept may have been specific to the heterogeneity of experiences of some clinicians. For example, two clinicians from the doctor-only group had extensive knowledge of ASBI related to their overseas training. However, this was not common amongst all clinicians. The likelihood of this occurring in additional groups would be low if subsequent participants received their training locally.

From a qualitative perspective, the methodology employed was considered to have influenced what was observed (internal validity) and it was hypothesised that to a certain extent, there was a limited degree of generalizability. Applicability of findings to ED staff of other hospitals within the Sydney local health district and comparable Australian metropolitan hospitals (external validity) is not clear. This was one of the drawbacks of purposive sampling, but as mentioned previously, a theoretically motivated approach warranted a trade-off with generalizability.

Qualitative research has used focus groups to emphasise the relationship between the substantive content of "what" was discussed and the shared dynamics of "how" it was expressed (465). A similar approach has been used herein to highlight the "what" of participant conversations. Thus, data analyses have emphasised discussion content in its substantive form. Notwithstanding, the "how" dynamic could have extended the implications of the current study by providing additional information on the shared experience of staff responses to ARIs. Unfortunately, limited resources prevented use of a second researcher to take supplementary field notes during group sessions. This would have provided additional data describing those shared dynamics such as body language as well as detailed 'traffic' of the conversation.

No social workers were involved in the focus group discussion partly because of scheduling and more generally because of the limited number of social work staff who work in a full time or even part time capacity in the ED. In many instances, the primary social worker assigned to deliver services in the ED served in a concurrent role providing acute care services in other parts of the hospital such as the intensive care unit or trauma centre. Many staff in a hospital-based social work department are rostered for after-hours/on call services that generate a callout to the ED. However, they often do not hold a full-time position in that capacity. Therefore, the input from social workers in the focus groups remained limited, but it was anticipated that inclusion criteria and recruitment techniques used in the national survey would increase chances of collecting data from this group of ED clinicians. Previous studies suggested ED directors and other staff identified social workers as an important healthcare worker to deliver effective ARI interventions (138, 244).

Using term frequencies or counts to form categories from the discussions meant attitude and PBC were substantially larger than role legitimacy and social norms. This method may have been biased by the number and nature of questions asked, although from a conceptual

perspective, attitude has been shown to be a stronger antecedent to behavioural intention than the other variables (261, 411, 428). For example, Godin et. al, (2008) note in their systematic review that health professionals' beliefs and perceived ability were more consistently associated with behaviour and intention compared to social factors and role identity. Nevertheless, this methodological bias existed and could have been reduced by increasing the sample size and using a validated questionnaire guide that was standardised on a comparable sample.

A subtle syntactical inconsistency was noted during the third group in a question prompt. While core question #1 queried injury or trauma "presentations", two follow up prompts referred to injury-related "admissions" rather than "presentations"; a syntactical error that may have influenced responses to that question when the prompts were used. It was understood that not all alcohol-related ED presentations resulted in a hospital admission so this could have affected participants' perceptions about the content of the question leading to responses that were inconsistent at face value. However, these prompts were only used in two groups and the inconsistency was noted by a participant at which time clarification was made by the moderator.

Some ambiguity may have been introduced into the design of the conceptual map, particularly between constructs associated with attitude and PBC. The constructs ARI and SBI required more detail of the charted relationships with attitude and PBC in terms of interaction effects, strength and direction. For instance, the mapped relationships could have delineated how attitudes regarding ARI interact with PBC to perform SBI. This is likely to be a highly significant interaction, however, the charting of such relationships solely on the basis of qualitative data may have proved challenging. The conceptual map was therefore used as a guidepost to refine a conceptual framework that informed subsequent quantitative analyses to test those relationships.

During content analyses, it was realised some focus group questions could have been more direct. For example, the question asking 'when would it be appropriate to screen for alcohol use', could have been rephrased; "When do you ask about alcohol consumption?", tapping on when/where clinicians find reason for querying patient alcohol use. This latter approach may have increased sensitivity and specificity towards answering hypotheses, but it may have compromised the generality of discussions by trending towards a close-ended prompt. Likewise, in the content analyses, invalid estimates of belief frequencies could have been obtained, which may have compromised identification of the true modal salient belief that existed in the population (Fishbein & Ajzen, 2010 p.103). This may have occurred during the course of group discussions, when dominant individuals influenced the direction of discussion and caused rarely held beliefs to appear more accessible in the population than they really were. Invalid estimates could have also been a result of inaccurate interpretation of text meaning by the researcher. Incorrect identification of true modal beliefs would have biased construct validity. Threats to construct validity were presumed to be reduced by using a theory-informed method for developing the coding scheme (483). This scheme the basis for frequencies and counts that guided the coding of beliefs around a modal point. Therefore, some error of estimates around a theoretical mean was likely.

5.8 Conclusion

There has been a renewed interest in the importance of health professionals' response to alcohol-related problems and ARI. This qualitative exploration of attitudes towards ARI and SBI in the ED has provided an index of how important clinician perspectives are relative to behavioural intention. Through this examination, hypotheses have been substantiated. Furthermore, a theory-driven conceptual framework supported propositions about the relationships between constructs of concern. The emerging themes from all group data suggested a model of testable relationships between categories and concepts using

quantitative statistical analyses. Previous surveys of clinician samples have been conducted to test such model specifications and offered practical conclusions about those relationships as well as how they may impact service performance (484). For example, Indig et, al. (2009) found having moderate to high confidence in conducting BI coupled with a sense of role legitimacy was associated with a significant increase in the likelihood of a clinician performing BI. Furthermore, it was concluded that a belief in one's clinical responsibility in the ED to address alcohol issues was a strong predictor of formal SBI. That is, increased sense of role legitimacy and perceived behavioural control were associated with an increased likelihood of behavioural intention to perform SBI. The relationships emerging from this qualitative study have preliminarily supported the conceptual framework proposed herein. This framework has been required as a precursor for further testing of a conceptual model delineating the relationships between the aforementioned theoretical constructs. It will be important to compare findings from earlier studies to results of a sample of the local population in order to properly elaborate on current hypotheses and propositions. By capturing the variation in relationships between categories, it will be possible to determine the strength and direction of relationships underlying the phenomena of interest.

The qualitative cross-sectional data herein has provided an appreciable categorical understanding of the potential strengths and directions of proposed relationships however limited by a modest sample size. Nevertheless, speculative elaboration suggested correlations existed between clinician idiosyncrasies and behavioural responses to ARI. For example, more conservative clinician attitudes may be related to stronger views about patient drinking behaviours. That is, a clinician who considers themselves a moderate drinker may apply personal benchmarking that delivers a subjective rather than objective opinion about patients who drink more than themselves (140, 319, 462). On the other hand, clinician personal drinking habits may provide an empathic source of insight and open the door of rapport with

patients, enabling objective/non-judgemental discussion on alcohol-related health issues. It is also possible clinicians who have experienced adverse alcohol events (whether their own or vicariously from someone close) are more likely to be less/more tolerant of others' negative experiences. This speculation warrants more in depth measurement and analyses with a larger sample using discrete variables and formalised hypotheses testing to adequately determine the strength and direction of those relationships through model specification.

This study reinforces the need for further research and development of a model to disentangle the particular aspects of attitude, PBC, role legitimacy and social norms that appear to influence clinician perceptions about their ability to help and effectively respond to ARI. Such research would take the form of a quantitative survey that allows for discrete variable analyses and relationship testing based upon the above categorical associations. The richness of the clinician comments has provided guidance and direction for what was needed to improve results and build on subsequent research. For example, discussions about attitudes towards ARI have been incorporated into a survey tool with discrete questions measuring how much time and effort clinicians feel these cases required and how much impact ARI has on ED resources. This has resulted in opportunities to provide an enlightened directive on how to improve clinician responses to ARI. As an example, future skills-based training for providing ASBI in the ED may focus more on empathic response delivery. Training may also consider how negative attitudes towards patient intoxication may affect the individual clinician's ability to respond in an unbiased manner. Furthermore, educational components might incorporate extant efficacy studies of ASBI and enhanced patient outcomes. These components may also integrate cost-effectiveness studies provided in a real-time institution relevant modality that gives clinicians a personal sense of how their efforts would indirectly impact hospital operations. This would alleviate apprehension and reservations about

implementing ASBI and help clinicians to contextualise their personal efforts within a broader endeavour to reduce the public health burden.

This research has also provided a lens of reflection for perceived barriers/facilitators to adopting a routine EBP in the ED. By providing a confident forum for clinicians to collectively share their feelings and review emotional responses to ARIs, occasions of self-reflective service were harnessed in a constructive and supportive manner that may contribute to more thoughtful provider-patient encounters. It may have also allowed proactive consideration of ways to successfully overcome barriers and increase adoption of routine EBP. For example, some clinicians may have considered responding to ARI to be a problem for public health academics. Consequently, this research has the potential to accurately re-position that clinical lens in a way that highlights emergency medicine as being integral to a public health response and thus overcome a conceptual barrier. It has been important to compare these findings to relevant studies to appropriately contextualise the clinical perspective within emergency medicine and public health. By surveying a sample of the local ED staff population, extrapolation and elaboration on contextual hypotheses and propositions refine that perspective even more.

Therefore, the following chapter is a detailed analysis of the proposed relationships identified in the theoretical framework and conceptual map. A national survey was employed consistent with the proposed relationships and hypotheses in order to generate data representative of the latent variables and conceptual model. Tests of association as well as estimates of variance have provided markers for determining direction, strength and in some instances, influence of variables upon each other and were utilised in the analyses herein. In the process, any variation in relationships between categories was analysed and permitted determination of the strength and direction of relationships underlying the phenomena of interest.

CHAPTER 6: QUANTITATIVE COMPONENT-ED ARI CLINICIAN SURVEY

6.1 Introduction and Overview of Quantitative Project

The second phase of this thesis involved designing, testing, and implementing a cross-sectional questionnaire based on the Theory of Planned Behaviour (TPB). It incorporated factors elicited from focus groups conducted during the qualitative component (Chapter 5) as recommended by the TPB questionnaire guidance developed by Francis et. al (2004). A review was conducted of previously used surveys and relevant instruments that targeted health clinicians in substantive areas such as medicine, dentistry, nursing, mental health, drug and alcohol (142, 355, 386, 450, 485). The range of concerns covered practice confidence, uptake of EBP, and attitudes towards substance use or chemically dependent populations and/or mental illness (59, 60, 138, 161, 191, 192, 244, 486-490). There were a limited number of standardised instruments where validity and reliability data had been obtained (309). Furthermore, there were not many study tools designed for the specific population of interest (Australian ED clinicians working with ARI).

A few previously conducted surveys specifically focused on SBI and alcohol in relation to ED staff, but were conducted outside Australia and did not always identify an explicit theoretical framework informing the investigation (138, 305, 307). One study in Australia did identify a theoretical framework but was limited to nurses (243) and another Australian study implicitly used theoretical constructs and extended to nurses and doctors (58). Where relevant and feasible, elements of those surveys/tools were distilled and adapted from, to develop the current instrument.

Constructs from the TPB were operationalised in this study to explore and explain aspects of clinician intent, willingness, and experience to screen and/or intervene in alcohol-related injuries. As an exploratory measure, the survey incorporated theoretical constructs from the TPB as well as an additional construct (role legitimacy) to address hypotheses

related to uptake of evidence-based practices in Australian EDs/TCs. Attitudinal factors have been recognised as important determinants in the response of clinicians to patients experiencing alcohol-related problems (188). Attitude measurement can be valuable in evaluating the impact of interventions as well as providing guidance for developing training programs. However, measurement lacking a theoretical underpinning to identify how the measured attitudes are related to behaviour has been subject to fundamental flaws and disconnected from valid and reliable interventions (491-493). Thus, the research design attempted to adhere to the proposed conceptual framework in order to minimise systematic and measurement errors leading to poor validity and reliability.

The following sections expand upon the previously identified rationale for a theoretical approach to measure and interpret clinician behavioural intention. Those sections include a review of the hypotheses to be tested, use of survey methodologies to explore behaviour, the study methods and design as well as the results and findings obtained from this survey. All descriptive statistics and regression analyses were conducted using SPSS version 24.0. All structural equation modelling (SEM) was conducted using SPSS AMOS version 23.0. The chapter will conclude with discussion about how the TPB was integral to interpreting the results and the implications for its use in developing clinical education and training programs.

6.2 Review of Hypotheses

A number of hypotheses were developed based upon the Theory of Planned Behaviour and the related conceptual framework, which served as a guide throughout the analyses. These hypotheses were underscored by two main research questions: *"What factors influence the use of SBI in ED clinicians responding to alcohol-related injuries?"* and *"Does the proposed framework/model capture enough variation in clinician behavioural intention to adequately explain the observed relationships between variables?"* As outlined in chapters three and four, several propositions were initially conceptualised, from which a distilled set of core

hypotheses were tested. Those hypotheses, listed in table 5, considered relationships between latent variables and the explanatory factors contributing to the reasons why clinician may, or may not intervene in ARIs. Both the endogenous and exogenous indicators operationalised in the survey, are included next to their relevant latent variable. The latent variables, were derived from composite factors (components) using factor analysis, which is explained in section 6.4.2. The responses to survey questions were considered observed variables, that reflected some underlying "latent" variables, or constructs of interest. Specifically, those constructs included the latent variables, that made up the conceptual framework to be tested within this thesis. As such, the latent variables were measured with some degree of error, which was taken into account in the residual analyses, and subsequently addressed as a whole in the structural equation modelling (SEM).

Table 5: Hypotheses Summary-Latent & Indicator Variables

Hypothesis Summary	Unobserved-Latent Variable		Observed-Indicator Variables	
Mediation	***Component (exo)***	***Component (endo)***	***Indicator (exo)***	***Indicator (endo)***
H1a. Clinician attitude/belief towards people who sustain an alcohol-related injury, will be directly related to the strength of the intention to intervene	**ARI ATTITUDES**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q19, Q24, Q26, Q29, Q35	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
H2a. Clinicians who perceive supervisor/peers approve of performing SBI, in response to alcohol-related injury, are more likely to have the intention to implement this practice	**SOCIAL NORMS**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q20, Q31, Q36, Q41	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
H3. Clinicians who believe performing SBI will reduce readmission rates to the ED, are more likely to intend to intervene with alcohol related injury	**PBC-CONTROL**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q18, Q22, Q23, Q27, Q30, Q40	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
H4a. A sense of role legitimacy as an ED professional to intervene in alcohol-related injury, is associated with uptake of SBI practice	**ROLE LEGITIMACY**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q25, Q34	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
Moderation	***Component (exo)***	***Component (endo)***	***Indicator (exo)***	***Indicator (endo)***
H5. Perceived behavioural control (self-efficacy) to perform SBI will have a moderating effect on the intention to intervene	**PBC-SELF EFFICACY**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q21, Q32, Q37	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
H6. A proportion of the observed variance in behavioural intention to perform SBI, can be accounted for by perceived barriers in the form of heavy workload and limited resources in the ED	**PERCEIVED BARRIERS**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q19, Q31, Q35	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43
Interaction	***Component (exo)***	***Component (endo)***	***Indicator (exo)***	***Indicator (endo)***
H7. The combined, interactive effects of attitudes, social norms, perceived behavioural control and role legitimacy, account for a significant proportion of the explained variance in behavioural intention, to perform SBI for alcohol-related injury amongst ED staff	**ARI ATTITUDES** **PBC-CONTROL** **ROLE LEGITIMACY** **PBC_SELF EFFICACY** **SOCIAL NORMS**	**BEHAVIOURAL INTENTION**	ED_ARI Questionnaire Items: Q19, Q24, Q26, Q29, Q35, Q20, Q31, Q36, Q41, Q18, Q22, Q23, Q27, Q30, Q40, Q25, Q34, Q21, Q32, Q37	ED_ARI Questionnaire Items: Q28, Q33, Q38, Q39, Q42, Q43

6.3 Methods

For this thesis, an online survey design was considered the best method to collect data that, characterised clinician attitudes and beliefs regarding alcohol-related injuries, and their sentiments about intervening. The logic was that ED clinicians maintain very time-intensive schedules, and access to them would be limited. Thus, to minimise respondent burden, a digital platform was used, which allowed users to initiate the survey and pause, then return where they left off as needed. Respondents were able to access the survey 24 hours a day via PC, personal phone or laptop, or other any other mobile device with internet access. Ethics approval was obtained with the Curtin University Human Research Committee (Approval Number HR 172/2013). Implied consent was obtained automatically when participants voluntarily logged onto the survey website.

6.3.1 Use of Survey Methodology to Explore Behaviour

Use of survey methodology has been a common approach to measuring attitudes and perceptions about human behaviour in the social environment. Implementation research has made use of survey methodologies to investigate the uptake of evidence-based practice by health care professionals. As a result, a few survey studies were located that had direct parallels with the current study. For example, Waller et. al, (1998) surveyed ED clinicians in England to explore perceptions of alcohol-related prevalence and levels of staff interest to improve a preventative response to alcohol harms. In that study, the questionnaire consisted of a self-report, 5-point rating scale (responses ranging from strongly disagree to strongly agree), but there was limited information on the details of the survey instrument such as number of questions, instrument reliability or validity (494). However, the methodological and substantive aspects to explore clinician behaviour had relevance to the development and design of this project.

Chappel et. al (1987), developed what was perhaps one of the earliest instruments designed to measure the attitudes of medical students towards "substance abuse". The Chappell, 1977 version of the Substance Abuse Attitude Survey (SAAS) contained '50 attitude statements' presented in Likert scale form (measuring degrees of agreement/disagreement). Over the course of rigorous development and evaluation, five attitude factors have emerged which represented the key analytic constructs of the instrument (permissiveness, treatment intervention, non-stereotypes, treatment optimism and non-moralism) (495). This particular instrument has received a relatively substantial amount of analytic attention over the years, and while it is general to substance use, some of the alcohol-related aspects were distilled for use in the current survey based upon the conceptualisation of the "attitude" construct.

In an investigation of factors influencing smoking intervention practices of antenatal clinic staff, Cook et. al, (1998) measured perceptions, knowledge and use of brief interventions in regular practice. Of particular note in this study was the analyses carried out on participants' personal smoking status and its impact on perceived willingness and ability to perform smoking cessation counselling. Bonferroni method indicated current smokers were significantly less willing and self-perceived less able than ex- and non-smokers to provide patients smoking cessation advice. Two paper-based surveys were used to collect self-report information via regular mail. It was not clear in this particular report exactly how many items were included in the questionnaire, but some adaptation from other scales was conducted and tests of psychometric properties referenced (328).

Measurement of mental health professional attitudes towards working with "drug users" has been achieved using the Drug and Drug Problems Perceptions Questionnaire (DDPPQ: Watson, 2003) which was adapted from the Alcohol and Alcohol Problems Perceptions Questionnaire (AAPPQ: (485). The DDPPQ was originally a 30-item instrument

administered as a paper-based mail survey and later refined and validated as a 20-item instrument with 5 principal components (496). Using Principal Component Analyses (PCA), the investigators were able to confirm construct validity and distil subscales related to component structures including role legitimacy (RL). It was from this psychometric evaluation that the construct of RL, which was originally identified in the AAPPQ (188), was included as a principal component in the current instrument.

The process of adapting the DDPPQ from the AAPPQ provided guidance for the development of the survey used herein. As it were, some of the items from the AAPPQ were adapted to the current instrument while construct validity of RL as assessed in the Watson (2003/2007) studies informed the development of items to measure the RL construct. The AAPPQ was developed by Cartwright (1980), as a 29-item measure to assess attitudes and therapeutic commitment of health care professionals towards "alcoholics". In its original conception, the AAPPQ was a 39-item instrument designed to measure therapeutic attitudes of non-specialist providers working with patient alcohol problems (188, 485). The AAPPQ data have been identified across 5 subscales or a single composite scale. However, some psychometric development and factor analysis has produced a shorter version of the composite scale (191, 497). The shorter 10-item instrument (S-AAPPQ) has established high correlation with the longer version, has Cronbach's alpha range of 0.7 - 0.9 and demonstrated good test-retest reliability (498). The SAAPPQ has subsequently been used to assess role security and therapeutic commitment in international samples of GPs who provided SBI with patients experiencing alcohol problems (160, 251). While GPs were the main participants in that study, comparative analyses may substantiate validity of relevant items in the current study to. Such items typically assessed providers' therapeutic commitment, motivation and work satisfaction with 'drinkers'.

National ASBI practices in EDs have been assessed using a survey format to characterise directors' attitudes and beliefs associated with treatment of injured and intoxicated patients (138). This particular US-based survey was cross-sectional and self-administered using either regular postal mail distribution or online administration. It contained items assessing perceived barriers, attitudes towards SBI, knowledge about ASBI and general demographic questions. While the article provided examples of questions, the total number of items was not mentioned, nor was there information on instrument psychometrics. It was noted that the survey was based on a previous national survey of trauma surgeons (244) with adaptations for emergency staff.

The Graham (2000) study explored ED physician attitudes and beliefs associated with alcohol abuse or dependence and the concerns of staff when asked to implement brief interventions. Similar to previous studies, an anonymous, cross sectional, self-administered questionnaire design was distributed using postal delivery and return. The 26-item instrument used a 5-point Likert-scale response option ranging from strongly disagree to strongly agree. Four substantive areas were covered including effectiveness of brief interventions in the ED, practice information such as typical protocol for addressing alcohol-related presentations, and opinions on which emergency staff member would be most effective in delivering an intervention (244). Modification of these questions were adapted to the current instrument to capture aspects of current treatment practices in the target population.

O'Rourke et. al, (2006) developed a survey to determine how attitudes towards alcohol-affected patients may influence physician's support and practice of brief interventions in the ED. Self-administration of the 45-item survey was conducted during an annual meeting of Emergency Physicians in the US. The survey was based upon previous work involving educational trials with medical residents to improve responses to alcohol problems (123). Familiarity with SBI techniques, belief in the efficacy of such interventions and whether or

not it is part of their role as an ED clinician, as well as personal/professional attitudes towards alcohol-related injuries were key items assessed in this survey and modified for use in the current study.

A recent Australian study did explore ED staff attitudes regarding alcohol presentations using a survey instrument distributed across two teaching hospitals in NSW (75). The mode of delivery was pencil/paper with responses scored on a 5-point Likert scale covering six domains of patient management in relation to alcohol. In addition to a series of demographic questions, the main survey consisted of approximately 40 items administered after a brief educational session as part of an in-service program. Surveys were also left in the ED of each hospital for staff completion. Usual practice, provider confidence and role responsibility were among the questions adapted from related studies and previous literature. Likewise, some adaptation from this survey was helpful in the development of the current instrument.

Based upon work towards a doctoral thesis, Freeman (2007) developed a survey instrument informed by the TPB for assessing predictor and behaviour measures of ED nurses working in hospitals in Victoria, Australia. Two separate questionnaires elicited in-depth responses based upon theoretical constructs including attitudes, social norms, perceived behavioural control and behavioural intention over approximately 140-items. A mix of Likert scaling, free-text entry and open ended questions was employed and due to the substantial use of key theoretical constructs, some adaptation from the Freeman (2007) instrument guided the development of the current instrument.

This study collected data using a sample survey design for several reasons. One is that, a representative sample could be drawn from the general population to provide unbiased estimates of the behavioural characteristics of concern. Another reason was that inferential statistics could be used to generalise from the sample, to estimate population parameters within a calculated margin of error. Thus multivariate data analyses were possible, to

estimate the complex relationships amongst the numerous variables, while making adjustments for potential sources of error and uncertainty in the survey data. Finally, to avoid the potential for variation in responses based upon mixed-modes of survey delivery, a single, web-version of the survey was offered (499). With these considerations in mind, the next sections discuss the full instrument design and development, as well as the pilot testing that preceded survey distribution and administration.

6.3.2 Survey Instrument Development and Design (ED-ARI)

The current survey instrument, (ED-ARI) was developed in accord with the recommendations for managing a TPB survey (410). General theory-based approaches and designs have been used widely for evaluating provider responses to patient alcohol use (389). Aspects of the survey design, such as item formulations, were adapted from surveys of the previously mentioned studies that focused on similar issues around clinician behaviour. Most of the studies referenced in the previous section utilised instruments that collected responses via pencil and paper. The current instrument was administered online, but there has been little evidence to suggest major biases between either form of administration (500). The design was built upon a web-based platform, to prospectively capture attitudes towards alcohol-related injury, as well as beliefs about screening and brief interventions amongst ED staff. The electronic survey platform was hosted by a collaboration between Curtin University and Qualtrics Research Software Company.

To account for cognitive processes in the context of responding to questions, and thus the effects this would have on attitude measurement, several methodological resources were consulted. Work by Tourangeau and Rasinski (1988) suggests there are structural properties of attitudes that are not always fully captured in the measurement of attitudes, especially in survey settings (501). As an example, they found that earlier items in a questionnaire create the context for subsequent questions, which can affect each stage of the response process.

The response process involves activation of related memories and schema associated with the attitude, thus evolving an attitude structure, or mind-set that drives the way a respondent answers questions. This influence was used as justification for developing the instrument, such that, items were randomly dispersed throughout the survey with reverse-coded versions of some items to enhance reliability and validity.

It is recognised that, through the context of judgement carryover, respondents may attempt to create the impression of being moderate on a topic, thus choosing middle response categories. This is particularly relevant for issues that may involve some degree of socially or morally questionable behaviours (502). Therefore, to minimise potential biases, more sensitive questions, such as the 'last time the respondent treated a patient with alcohol-related injury', and the 'last occasion the respondent drank', were positioned at the end of the survey. Questions requiring retrieval of basic information (demographics) were placed at the beginning of the survey for the reasons previously stated, in addition to having relevant data for comparing completers vs. non-completers.

As a final note on instrumentation effects, extensive consideration was given to grammatical structure during the development phase. Detailed attention was given to syntax in the question wording, with the intent to minimise the use of terms that may, unnecessarily evoke strong emotions and feelings, which would bias the respondent in subsequent responses. Nevertheless, this was sometimes unavoidable in an effort to provide an unambiguous and neutral questionnaire format. For example, to assess experiential attitudes associated with treating ARIs, it was necessary to ask respondents whether they "had *bad experiences* with ED cases that involved alcohol-related injuries". However, no time delimiters such as "often" or "never" were used. Similarly, adverbial qualifiers such as "*very* bad" or "*highly* worthwhile" were avoided in the questionnaire items. One exception to this, was a question positioned at the end of the survey, that assessed whether the respondent was

“highly” likely to conduct ASBI within the next 30 days. This exception was necessary in order to tap onto behavioural intention, which is innately a prospective construct, and necessitated an adverbial qualifier for the purpose of measuring the degree/intensity of likelihood.

While there is a substantial volume of literature on survey designs and questionnaire formulation, there was a lack of agreement on the best way to facilitate accurate mapping of attitudes using response systems that allowed reporting of neutral, moderate or extreme attitudes (503, 504). For example, some argued that the number of points on rating scales should depend on how refined peoples’ mental representation of the construct were, as well as types of statistical analyses to be used (505). In that regard, the number of scale points on a Likert response system could vary greatly, depending upon the objectives of the research project. This could require greater effort in cognitive processes and as such, Krosnick and Fabrigar (1997) suggested 5-7 point scalars were more reliable than fewer or more points, based upon curvilinear patterns, that have emerged throughout their empirical reviews. An objective of this thesis, was to capture not only attitude direction, but also intensity. Thus optimal response scoring necessitated use of a 7-point Likert scale, with consistent use of agreement endpoints (viz, “strongly agree”, “strongly disagree”). In terms of midpoint designator, again, there was modest consensus about the most appropriate measure, but empirical studies showed any differences between terms, at least on 5-7 point scales were negligible (506). Therefore, a current convention of “neither agree, nor disagree” was used throughout the instrument. As such, respondents were able to report neutral, moderate or extreme attitudes with equal opportunities for accurate mapping.

6.3.3 Pilot Testing

An informal process was adopted, following recommendations for pilot testing of survey instruments, to ensure some degree of consistency between the theoretical model and

the questionnaire instrument (484, 507). Staff from a suburban health service were solicited to participate in a short pilot test of the draft ED-ARI instrument. An internal email providing a link to the pilot survey, was distributed to eligible respondents; clinical staff currently working in the ED. A total of 94 clinicians participated in the pilot testing; 66 completed the survey electronically and 28 submitted a paper version (tables 6 & 6.1). There was an approximate 75% completion rate for surveys collected over a seven-day period.

General feedback was solicited on the 8th day, directly from staff who were available during two in-service trainings, which included a group of nurses and doctors. Verbal and written (via free-text option in electronic version) feedback was solicited from staff on issues such as: comprehension and reading ease; terminology; response options; and, navigational aspects of the web-version (look and feel). Question #13 asked how close the respondent's hospital/ED was to a night-time entertainment (NTE) district. Some clarification was requested on this item, so a short note was added that provided an example of what was meant by NTE (i.e. a CBD that has extended hours alcohol trading). Questions #14 and #15 asked respondents to report on their prior alcohol screening, and alcohol brief intervention trainings, respectively. Clarification was required for both questions so a short parenthetic note was added to each. For instance, #14 was amended to include examples of alcohol screening tools (AUDIT, RAPS, CAGE, CRAFFT, ASSIST etc.). Question #15 was amended with a highlighted and brief definition of BIs: "Brief interventions usually provide advice about risks associated with drinking, possible links between alcohol use and reasons for admission, and options to make changes". This definition was included on the introduction page of the survey. The respondent was also provided with instructions on how to retrieve a pop-up definition whenever their cursor was placed over the phrase "brief intervention" in subsequent stem items.

In general, the flow and user interface with the online instrument was reported as satisfactory. However, some users did experience modest difficulty with attempts to complete the survey using a mobile device such as a handheld phone. In such instances, the graphics display interface required the user to scroll over the page to view the entire question item. While there was a feature for determining mobile compatibility of questions, the options to tailor mobile views proved more limited and failed to achieve an optimal result. For example, a vertical display of response items and multi-line scrolling of the questions could have been done, but this display appeared more awkward than the original form. Since less than 15% of respondents reported completing the survey using a handheld device, and only ~3 noted challenges with this mode of administration, a decision was made not to modify formatting any further for mobile compatibility. All pilot testing feedback was collated and incorporated into the final instrument as appropriate. After, editing and modifications the final instrument scaling was subject to Cronbach testing for inter-item reliability and demonstrated an alpha measure of .829 for 26 items. The final version is located in Appendix D.

Table 6: Pilot Test Demographics

Characteristic	n	%
Gender		
Male	36	40%
Female	53	60%
Total	89	
Age (years)		
20-29	41	46%
30-39	29	33%
40-49	14	16%
50+	5	6%
Profession		
Doctor	37	42%
Nurse	41	46%
Allied Health	11	12%
Weekly Hours Worked		
<= 16 hrs	3	3%
17 - 32 hrs	11	12%
33 - 40 hrs	8	9%
41+ hrs	65	73%
Years Worked		
less than 3 yrs	13	15%
3.1 - 6. yrs	4	4%
6.1 - 10 yrs	30	34%
10.1 - 15 yrs	21	24%
15.1+ yrs	14	16%

Table 7: Pilot Test Demographics (Training)

Characteristic	n	%
Screening Training		
No	61	74%
Yes	8	10%
Don't Know/Recall	13	16%
Brief Intervention Training		
No	62	76%
Yes	10	12%
Don't Know/Recall	10	12%

6.3.4 Sample Size Estimation and Selection Criteria

The required sample size for achieving an acceptable effect size was calculated according to conventional standards (508). A conservative estimate was determined using G*Power 3.1 for Mac OS X (509, 510). Input parameters were based upon an F-test with the highest form of statistical tests (ANCOVA using post hoc tests) which generated the following: Effect size = 0.25; Type I error probability = 0.05; with 5 groups; and, one covariate. Based upon these specifications, the minimum sample size required was 400 (critical F = 1.86; power = .95).

Selection criteria included clinicians currently working in the ED of any hospital across Australia, its Territories, and New Zealand. While the typical ED clinician is usually a nurse or doctor, the criteria also included allied health professionals such as social workers, physiotherapists, occupational therapists as well as care coordinators. This was based upon allied health clinicians having a substantive role in the care of patients with alcohol-related injuries in most EDs. Care coordinators were a limited profession, often newly created to serve a specific role in the ED, which liaised between other allied health services. Administrative and ambulance staff were excluded due to their substantively different role with patients.

6.3.5 Survey Distribution and Data Collection

A few options were considered with regards to administration and distribution of the ED-ARI survey. After discovering the ongoing ACEM Alcohol Harms study, contact was made with the College and other national professional bodies to access membership distribution lists for survey administration. After apprising each organisation of the thesis objectives, permission was obtained from ACEM, CENA, and the AASW to access their respective memberships through organisational newsletters and bulletins (See Appendix E). Periodic organisational emails provided potential respondents with a brief description of the research project and an embedded html link that connected the user directly to the survey web

page. Two different URLs were available depending on the participants' preference to take the survey: on a PC/laptop or handheld device such as a mobile phone. In each case, the survey 'look and feel' was compatible with the type of electronic interface they planned to use (i.e. desktop or handheld). Responses were collected over a period of ~1.5 months (50 days). The survey was live from 13 May 2015 through 02 July 2015.

ACEM reported there are approximately 1,928 practicing ED doctors in Australia, of which roughly 10% participated in the survey. CENA suggests 1,335 total memberships, of which less than 12% took the survey. The AASW identified a membership pool of 8,500, thus making the number of survey participants representing that organisation less than 1%. It was not possible to determine the membership representation of survey takers in other allied health groups (physiotherapist, occupational therapists, care coordinators), since their total was less than 20 respondents, combined. While ED doctors generally must be members of ACEM in order to work in the ED, it was possible for some medical respondents to not have affiliation with that organisation. However, in the analysis, all medical respondents reported ACEM affiliation. Just under 55% of nurses were not CENA members, which suggests word of mouth, and other forms of advertisement/distribution (internal emails from ED directors etc.), may have been how many nurses were alerted to the survey. Thus, it was difficult to determine the exact response rates based upon organisational memberships, and consequently, professional categories.

Completion rates were also challenging to calculate. Due to anonymity, the Qualtrics program was unable to provide information on individuals who opened one survey, and later completed a new one. That is, while over 700 surveys were initiated, and 543 were completed, it was possible for the same respondent to begin a survey, and then due to non-activity, the system timed out (clinician was called away to a priority ED case), requiring a new survey to be started. Nonetheless, based upon these very rough estimates, the

approximate completion rate would have been under 80%. Professional and organisational designations are represented in Appendix F.

While it would have been insightful to follow up with participants longitudinally, the guarantee of complete anonymity was necessary to augment validity and response rates. Thus respondents were not asked for additional identifying information. However, respondents were offered inclusion in a random drawing for 20 x $50 gift vouchers at local retailers. Random draw details were collected on a different site; which respondents were directed to at end of the survey. At this site, respondents could provide an email address that would be used in the draw for follow up contact. Random Picker was the online application used to generate randomness: the process used thermal & buzzing noise, based on physical processes internal to that site. Respondents were notified via email of their winnings and provided with an electronic Coles Group & Myers eGift Card for $50.

https://www.randompicker.com/Project/Public/Protocol.aspx?Key=246419x42786

6.4 Demographic and Component Descriptives

The following sections present analyses of the ED-ARI data that was collected over a 50-day period. It begins with basic descriptive statistics on the sample demographic factors and reported behavioural characteristics. Thereafter, the section on confirmatory factor analysis (CFA) and principal components analysis (PCA) discusses the composite variables identified within the ED-ARI core questionnaire. This is followed by a section on scale and inter-item correlations. The univariate and multivariate analyses are concluded with a summary discussion of the findings.

One questionnaire was removed from the data set; the respondent had worked in an ED, but in another country. Missing data (excluding demographics) were addressed using Expectation Maximisation in SPSS, to obtain maximum likelihood estimates (511, 512).

There were varying degrees of skewness in the responses contributing to non-normal distributions in the dataset. According to Tabachnick (2013) and others, these violations have not been considered major threats to validity in multivariate analyses, where large samples are concerned (200+ cases). Thus, statistically significant, skewed distributions in large samples, do not make a substantive difference in the analyses (513) (p. 80). No univariate (z-score cut off = ±3.29), or multivariate outliers (Mahalanobis cut off = 18.47) were identified (514).

6.4.1 Respondent Demographics

Over the 50-day period in which the survey was available online, 543 surveys were completed (table 8). Seventy-four percent of the respondents were female, and more than half (58%) of the total were nurses.

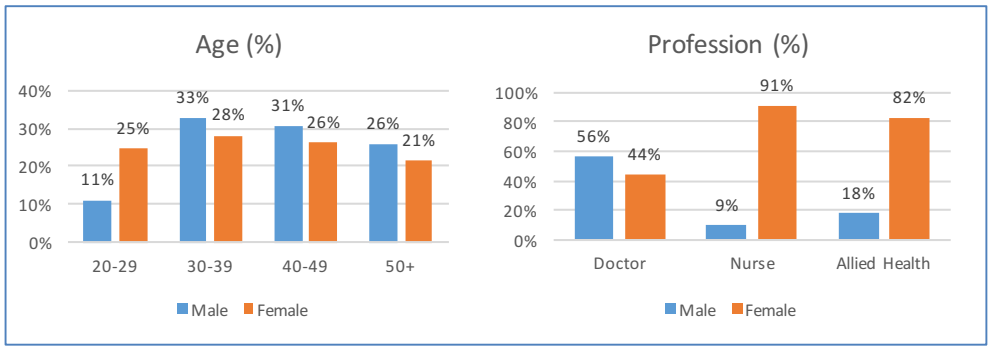
Table 8: ED-ARI Sample Demographics

Characteristic	n	%
Gender		
Male	144	26.5
Female	399	73.5
Age (years)		
20-29	114	21
30-39	159	29.3
40-49	148	27.3
50+	122	22.5
Profession		
Doctor	192	35.4
Nurse	317	58.4
Allied Health	34	6.3
Weekly Hours Worked		
<= 16 hrs	45	8.3
17 - 32 hrs	204	37.6
33 - 40 hrs	223	41.1
41+ hrs	70	12.9
Years Worked		
less than 3 yrs	123	22.7
3.1 - 6. yrs	114	21.1
6.1 - 10 yrs	106	19.6
10.1 - 15 yrs	95	17.6
15.1+ yrs	103	19

Characteristic	n	%
Hospital Location (state)		
ACT	12	2.2
QLD	83	15.3
NSW	124	22.8
NT	8	1.5
SA	17	3.1
TAS	10	1.8
VIC	179	33
WA	70	12.9
NZ	38	7
Elsewhere	2	0.4
Hospital Type		
Metro-Major Referral	268	49.4
Metro-Urban District	140	25.8
Regional/Rural Base	111	20.4
Private Hospital	5	0.9
Paediatric Only	10	1.8
Other	9	1.7
Hospital-CBD Proximity		
0-5km	306	56.4
6-10km	79	14.5
11-20km	90	16.6
21-40km	53	9.8
41+km	15	2.8

In the ED-ARI sample, 90.5% of nurses and 82.9% of allied health were female, while doctors were more likely to be male (56.3%). There was a significant difference across these proportions (χ^2 (2, n=543) = 136.15, p<.001 eta^2 = .5), which suggested a gender-profession relationship. A review of the literature showed the overall staff, female to male ratio (~.7/.3), was similar to international ED staff proportions. For example, one study presented a sample where 56% of doctors were male and 80% of nurses were female (515). Similarly, Kelleher (2009) noted ED staff were primarily female nurses (81.8%); Freeman et. al, (2011) reported an 86% female nursing staff in their study (nurses only sample); and, Counselman et. al, (2009) reported ED nursing staff were mostly women (82%) with doctors remaining a male-dominated field (79%). Age and profession disaggregated by gender can be found in figure 7.

Figure 7: Age & Profession by Gender



A substantial proportion of the sample (65%) reported having less than 10 years of dedicated service in the ED, and most (78%), worked between 17-40 hours per week. Nurses had somewhat more experience in the ED, which was consistent with the significant relationship observed between profession and years worked (χ^2 (8, n=541) = 26.821, p<.001 eta^2 = .2). That is, nurses tended to have worked longer in the ED compared to doctors and allied health (table 9).

Table 9: Years Worked in ED by Profession

	Years Worked in ED					Total
	<3	3.1 - 6	6.1 - 10	10.1 - 15	15.1+	
Doctor	53	25	29	38	47	192
Nurse	60	77	71	53	54	315
Allied Health	10	12	6	4	2	34
Total (%)	123 (22.7)	114 (21.1)	106 (19.6)	95 (17.6)	103 (19)	541

X2 (8, n=541) = 26.821, p<.001 (between professions) eta2 = .2

The vast majority of clinicians (71%) worked at a hospital within 10km of the central business district (CBD) and were assigned either to a major referral (49%) or urban district (26%) facility (figure 8). Although all Australian states and territories including New Zealand were represented, most respondents resided/worked in either Victoria (33%) or New South Wales (22.8%) (figure 9). Of the two respondents who reported "elsewhere" one identified locations across Australia and NZ, and the second was from Papa New Guinea.

Figure 8: Hospital Type & CBD Proximity

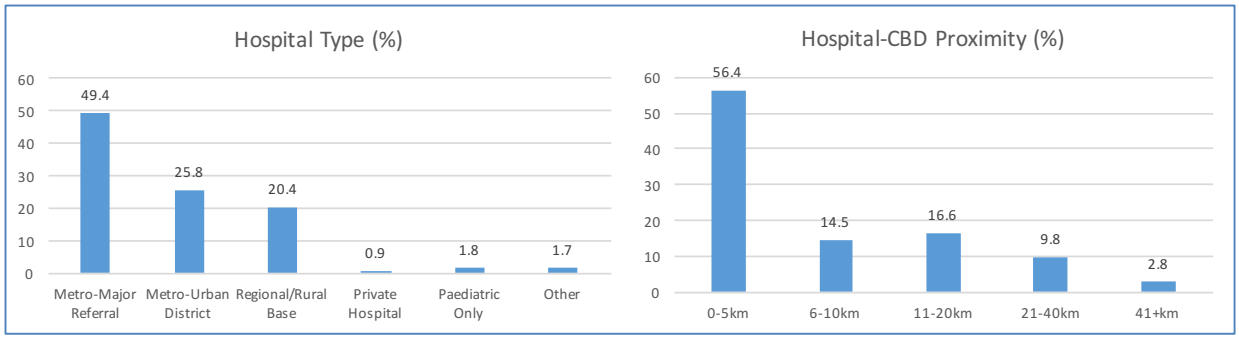
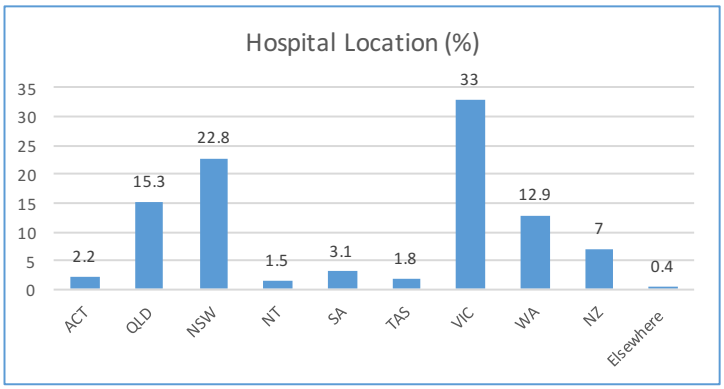


Figure 9: Hospital Type & Location



Clinicians were asked to report on their level of formal ASBI training. Formal training was considered an: in-service; continuing education; and/or, a standard course on ASBI. A significant majority of the sample reported no formal screening training (68%), nor formal brief intervention training (69%) (table 10). Kelleher & Cotter (2009) noted 78% of their sample had not received any specific alcohol and/or drug training, while Indig et. al, (2009) suggested only 6% of doctors and 5% of nurses in their study reported ability to use a formal screening tool as part of their normal practice. In contrast, Freeman et. al, (2011) reported 69% of their nurse sample had undertaken alcohol-specific training or education. ASBI training was disaggregated based on profession in figure 10.

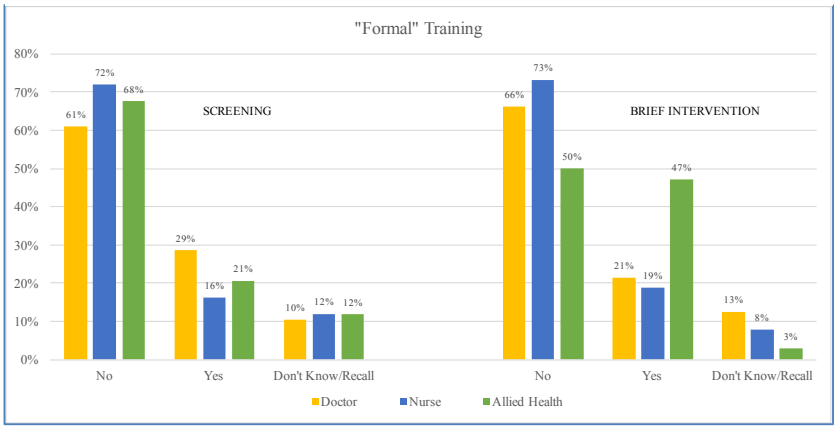
Table 10: Respondent ASBI Training and Days Since Last ARI Encounter

Screening Training	**n**	**%**
No	368	67.8
Yes	113	20.8
Don't Know/Recall	62	11.4
Brief Intervention Training		
No	376	69.2
Yes	117	21.5
Don't Know/Recall	50	9.2
*Days Since Last ARI Encounter**		
Last 24 hours	224	41.3
Last 2-7 days	219	40.3
More than 1 week	100	18.4

*X^2 (4, n=543) = 22.497, p<.001, eta2 =.06 (m=4.42, sd=4.93)

There were significant differences between those who had training and those who did not-across the sample. Between profession and within profession differences were also noted.

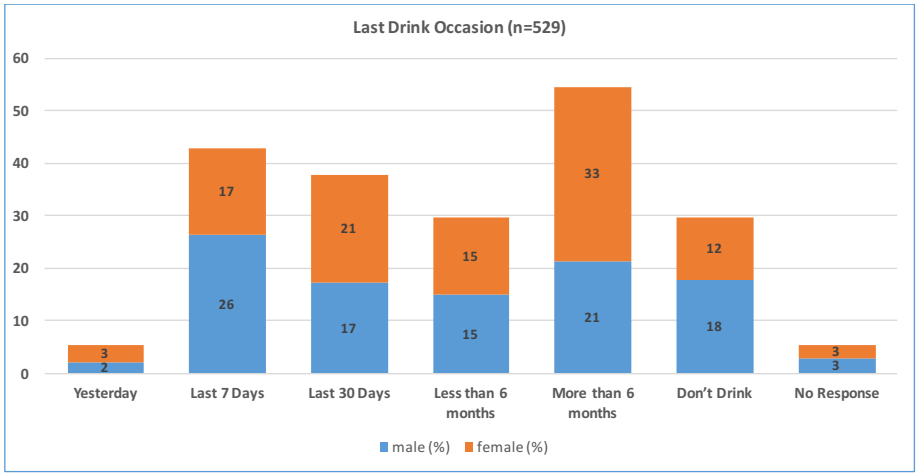
Figure 10: Formal Training by Profession



In spite of the reported low levels of training, 80% of clinicians stated they treated a patient with an alcohol-related injury within a week of the survey, and half of those (n=224) were involved in such a case, the day preceding their survey response (table 10). The median number of days since the last ARI encounter was 4.42 days.

Many clinicians stated they drink, with under half (41%) reporting the last occasion they had four or more standard drinks of alcohol, was within 30 days of taking the survey (figure 11). For reporting accuracy on this particular question, an image was displayed with 5 examples of a 1.0 standard drink (beer, wine or spirits), and 1 example of a full-strength beer containing 1.5 standard drinks. There were 14 non-responses to this question, but no significant differences between profession groups or gender. The median response was "less than 6 months" since last drinking occasion.

Figure 11: Respondent Last Drink Occasion



6.4.2 Principal Components & Confirmatory Factor Analysis

Factorial validity of the theoretical constructs was tested using a first-order confirmatory factor analysis (CFA) method with oblimin rotation. The purpose was to assess the multidimensionality of the proposed conceptual framework derived from the TPB developed by Fishbein and Ajzen (1991). The 26 items of the ED-ARI scale were initially

subjected to principal components analysis (PCA) using SPSS version 24. Data were assessed prior, to determine suitability for factor analysis. An inspection of the correlation matrix revealed the presence of many coefficients above .3. The Kaiser-Meyer-Olkin (KMO) value was .857, exceeding the recommended threshold of .6, while the Bartlett's Test of Sphericity reached statistical significance (χ^2 (325) = 4101.92, p< .001), supporting correlation matrix factorability (516, 517).

The first application, using the maximum likelihood extraction method, resulted in a six-factor structure. A few items (questions; Q23, Q24, Q25, Q26, Q30, Q34) loaded with slightly different weights (all above .3) on two factors simultaneously. Five of those double-loading items, loaded higher on the factor that was conceptually congruent with the proposed framework. The sixth item (Q30), was the lowest loading item on two factors, but was more theoretically consistent with the fifth factor. The initial pattern matrix produced eigenvalues that accounted for 54.2% of the variance with six factors.

A subsequent PCA revealed the presence of six components with eigenvalues exceeding 1, explaining 23.2%, 8.8%, 7.3%, 6.4%, 4.4%, 4.3%, of the variance respectively. The screeplot was inspected as well, and revealed a prominent break after the fifth component. The five-component solution explained 50% of the overall variance, and therefore retained (table 11). To facilitate interpretation of this five-component solution, oblimin rotation was performed with all items forced onto the five components. The rotated solution revealed the presence of a simpler structure, with each item loading substantively on only one component (table 12). This interpretation was consistent with previous research. As noted in section 3.4.3, although some studies have supported a four factor/component model (405, 428, 440), others have suggested that, a five factor/component multidimensionality exists within the TPB (424, 437). The factor interpretation, and subsequent component development in this study, were consistent with the latter propositions. Thus it was

determined that PBC would be subsequently analysed as two subcomponents: PBC-control, and PBC-self efficacy. The factor-loading and component matrix tables, along with the full list of questionnaire items, are located in appendix G.

Table 11: Principal Components Analysis-Factor Loadings

Variable Name	*Factor*				
	1	2	3	4	5
interest_train_ASBI_42	0.83				
interest_phone_app_ASBI_43	0.822				
use_smartphone_app_33	0.794				
ASBI_proced_ED_would_cond_38	0.725				
supp_concep_ASBI_ARI_39	0.613				
colleague_expect_SBI_28	0.532				
worth_SBI_ARI_30	0.449				-0.311
ED_ARI_expect_20		0.683			
R_unaware_screen_ED_31		0.672			
R_most_not_think_respon_36		0.614			
likely_conduct_ASBI_30d_41		0.593			
respon_ask_drink_beh_34	0.347	0.453			
my_role_BI_25	0.343	0.422			
R_ARI_time_comsum_19			-0.747		
R_ARI_bad_exper_29			-0.671		
pleas_SBI_ARI_24			-0.564		-0.324
R_no_time_ASBI_ED_35			-0.539		
R_ARI_poor_dec_26			-0.43		0.313
R_diff_id_alc_dep_32				0.795	
ID_haz_harm_drink_21				0.738	
confid_screen_advise_37				0.495	
decis_ASBI_entire_me_40					-0.617
BI_effect_ARI_22					-0.591
ED_PracSetting_18					-0.535
screen_detects_future_23	0.302				-0.431
easy_perf_BI_27					-0.356

Extraction: Principal Component Analysis
Rotation: Oblimin with Kaiser Normalization
Rotation converged in 14 iterations

The five-component structure was then revised to a six-component structure, based on theoretical congruency with the previously identified TPB model constructs, and the proposed conceptual framework. The additional component accounted for role legitimacy, and proposed in the conceptual framework. This revision (table 12) was more statistically robust, as determined by subsequent analyses. Those analyses included an inter-correlation comparison as explained in the next section. Behavioural intention was revised from a 7- to a 6-indicator component with factor loadings ranging between .532 - .830, by moving Q30. Item Q30 initially loaded on both behavioural intention and perceived behavioural control (PBC-Control). It was determined that Q30 was theoretically more congruent on PBC-

Control (component 5) than behavioural intention. Therefore, Q30 was included in the new PBC-Control construct (now a 6-indicator component) with factor loadings ranging from -.311 to -.617.

Table 12: Principal Components Analysis-Component Loadings

Variable Name	*Component*					
	1-Behavioural Intention	2-Social Norms	3-Attitude-ARI	4-PBC-Self Efficacy	5-PBC-Control	Role Legitimacy
interest_train_ASBI_42	0.83					
interest_phone_app_ASBI_43	0.822					
use_smartphone_app_33	0.794					
ASBI_proced_ED_would_cond_38	0.725					
supp_concep_ASBI_ARI_39	0.613					
colleague_expect_SBI_28	0.532					
worth_SBI_ARI_30					-0.311	
ED_ARI_expect_20		0.683				
R_unaware_screen_ED_31		0.672				
R_most_not_think_respon_36		0.614				
likely_conduct_ASBI_30d_41		0.593				
respon_ask_drink_beh_34						0.453
my_role_BI_25						0.422
R_ARI_time_comsum_19			-0.747			
R_ARI_bad_exper_29			-0.671			
pleas_SBI_ARI_24			-0.564			
R_no_time_ASBI_ED_35			-0.539			
R_ARI_poor_dec_26			-0.43			
R_diff_id_alc_dep_32				0.795		
ID_haz_harm_drink_21				0.738		
confid_screen_advise_37				0.495		
decis_ASBI_entire_me_40					-0.617	
BI_effect_ARI_22					-0.591	
ED_PracSetting_18					-0.535	
screen_detects_future_23					-0.431	
easy_perf_BI_27					-0.356	

Extraction: Principal Component Analysis
Rotation: Oblimin with Kaiser Normalization
Rotation converged in 14 iterations

Social norms initially loaded with 6-indicators ranging from .422 to .683. However, based upon theoretical conceptualisation, the two lowest factor loadings (Q34 and Q25) were considered representative of role legitimacy, which was therefore, separated out to a sixth component with loadings ranging from .422 - .453. The social norm component was revised to sum across four indicators with factor loadings ranging from .593 to .683. It may be that role legitimacy interacts with social norms to impact behavioural intention. Subsequent analyses testing this hypothesis were conducted. Additional descriptions of each component, are provided in the multivariate ANOVA analyses for each component (beginning with section 6.5.2).

6.4.3 Component Inter-correlation Comparisons

Once the respective components were revised, inter-correlations were calculated for all components and comparisons were made between the original (table 11-factors) and revised (table 12- components) pattern matrices. From the original matrix, there were a number of significant correlations across all six components. An exception was the relationship between PBC-Self Efficacy, and two components: behavioural intention; and, attitude towards ARI. In this case, there were small, but non-significant relationships. For all other components, correlations were significant, and either of small or medium strength. These component inter-correlations are presented in table 13.

Table 13: Component Inter-Correlation Comparisons

Component Structure-Original	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**
1. Behavioural Intention	24.37	5.92	--					
2. Attitude ARI	13.36	3.97	.169**	--				
3. Role Legitimacy	9.88	2.28	.446**	.181**	--			
4. Social Norms	15.36	4.76	.127**	.196**	.435**	--		
5. PBC-Control	19.56	4.49	.426**	.357**	.399**	.258**	--	
6. PBC-Self Efficacy	12.96	3.16	.079	.038	.216**	.203**	.228**	--
Component Structure-Revised	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**
1. Behavioural Intention	28.44	6.65	--					
2. Attitude ARI	13.36	3.97	**.197****	--				
3. Role Legitimacy	9.88	2.28	**.475****	.181**	--			
4. Social Norms	15.36	4.76	**.164****	.196**	.435**	--		
5. PBC-Control	24.40	5.31	**.513****	**.377****	**.459****	**.297****	--	
6. PBC-Self Efficacy	12.96	3.16	**.1***	.038	.216**	.203**	.216**	--

** Correlation is significant at the 0.01 level (2-tailed).

From the revised matrix (table 12), the correlations between behavioural intention and all other components increased, whilst the correlations with PBC-self efficacy strengthened to the level of significance. Likewise, the relationships between PBC-Control and all other components strengthened. The self-efficacy component did not appear to have as strong a relationship with many of the other components, although small, but significant correlations existed with role legitimacy, social norms and PBC-control. The relationship between PBC-

control and PBC-self efficacy decreased slightly in the revised structure, but remained significant. All of the inter-correlations were small to medium, but not strong enough to raise concerns about multicollinearity in subsequent analyses. Notwithstanding, tolerance and VIF coefficients were regularly assessed to rule out the presence of multicollinearity in later analyses.

6.5 Data Analyses

The next few sections present a number of analyses that explored univariate and multivariate characteristics within and between groups. These analyses examined how certain characteristics were represented and organised, under the structural components derived from the CFA. The preliminary analyses demonstrated the potential for unique group differences, to emerge at first glance within the sample. However, as will be shown, some initially strong indicators did not remain prominent throughout more complex analyses, and in short, only a few demographic characteristics appear to maintain significance. The objective was to identify the unique demographic qualities that enhanced the ability to disentangle the variance within each component. This in turn allowed deeper explanations for the different levels of behavioural intention. These exploratory sections are followed by assessment of between-group differences, and hypotheses testing using multiple regression analyses. This will precede subsequent analyses to test the overall model and main hypotheses using structural equation modelling (SEM).

6.5.1 Univariate Analysis

To explore the contribution of demographic indicators within each of the six components, univariate analyses were conducted to identify significant differences. T-tests and one-way analysis of variance tests (ANOVA) identified significant group differences for gender, profession, age, years worked, ASBI training, and time since last ARI encounter

(table 14). Where there were more than more than 2 levels for each demographic category, *F* ratios were calculated and Tukey post-hoc tests conducted to identify discrete differences.

Table 14: Component Univariate Analysis

Significant Variable	Category	Behavioural Intention			Attitude-ARI			Social Norms			PBC-Control			PBC-SE			Role Legitimacy		
		M	*(SD)*	*t/F*	*M*	*(SD)*	*t/F*	*M*	*(SD)*	*t/F*	*M*	*(SD)*	*t/F*	*M*	*(SD)*	*t/F*	*M*	*(SD)*	*t/F*
Gender	Male	27.35	6.72	**5.36***	13.36	3.85	0.00	16.00	4.50	3.50	25.07	4.87	3.12	13.31	2.78	2.41	10.03	2.15	0.94
	Female	28.84	6.58		13.36	4.01		15.13	4.84		24.16	5.45		12.84	3.28		9.82	2.32	
Profession	Doctor	27.51	7.22	**6.01****	13.84	4.01	**14.32****	16.28	4.34	**7.48****	25.70	5.38	**14.08****	13.23	2.84	1.49	10.21	2.21	**5.59***
	Nurse	28.67	6.43		12.77	3.79		14.70	4.93		23.41	5.20		12.77	3.35		9.61	2.35	
	Allied Health	31.59	3.56		16.24	3.83		16.35	4.44		26.33	3.67		13.29	2.97		10.50	1.60	
Age Group	20-29	29.00	6.09	**3.57***	12.78	3.79	1.82	15.58	4.53	0.59	18.93	4.43	1.09	13.25	2.81	1.83	10.14	2.32	2.14
	30-39	29.35	6.24		13.27	3.83		15.61	4.87		19.75	4.34		13.21	2.96		10.03	2.20	
	40-49	28.33	7.25		13.39	3.80		15.31	4.58		19.87	4.64		12.92	3.45		9.85	2.31	
	50+	26.88	6.69		13.98	4.44		14.91	5.05		19.52	4.55		12.43	3.31		9.46	2.28	
Years Worked	<3 years	30.35	5.79	**8.55****	13.79	3.90	1.92	16.33	4.60	**2.41***	24.82	5.27	1.97	12.91	2.69	1.11	10.52	2.05	**3.48***
	3.1-6.0 years	28.95	5.94		12.78	3.98		15.34	4.66		24.11	4.89		13.46	2.84		9.76	2.17	
	6.1-10.0 years	28.64	6.58		13.01	3.85		14.40	5.23		23.79	5.26		13.01	3.45		9.51	2.66	
	10.1-15.0 years	28.41	6.74		13.20	3.66		15.28	4.35		25.61	5.53		12.72	3.39		9.75	2.27	
	15.1 + years	25.40	7.42		14.02	4.35		15.17	4.77		23.75	5.54		12.65	3.45		9.71	2.15	
Screening Training	No	28.02	6.85	2.70	13.22	4.01	0.82	14.11	4.48	**51.4****	23.89	5.17	**5.43****	12.62	3.17	**7.28****	9.52	2.35	**15.3****
	Yes	29.65	6.17		13.76	3.94		18.77	4.07		25.54	5.17		13.85	3.02		10.79	1.91	
	Don't Know/Recall	28.77	6.02		13.44	3.76		16.66	4.22		25.37	5.97		13.37	3.03		10.31	1.91	
BI Training	No	28.19	6.66	0.92	13.23	3.93	0.69	14.16	4.46	**49.2****	23.97	5.26	**4.61****	12.81	3.22	1.48	9.57	2.26	**12.6****
	Yes	29.11	6.61		13.55	4.27		18.63	4.15		25.63	5.41		13.29	2.97		10.72	2.09	
	Don't Know/Recall	28.76	6.64		13.84	3.48		16.82	4.32		24.80	5.07		13.36	3.09		10.24	2.35	
Last Treated ARI	Last 24 hours	27.58	7.21	**3.26***	12.88	4.09	**4.09***	15.63	4.68	0.73	23.98	5.37	1.21	13.33	3.08	**4.18***	9.78	2.41	0.35
	Last 2-7 days	29.14	6.06		13.44	3.78		15.25	4.82		24.74	5.25		12.91	3.18		9.93	2.23	
	More than 1 week	28.85	6.40		14.23	3.96		14.99	4.80		24.60	5.31		12.25	3.17		9.98	2.10	

* p<.05 **p<.001
2-group comparison; F applies to 3+ group comparisons

Profession, alcohol screening and brief intervention (ASBI) training, tended to be significant across most components. More than half of the demographic factors were significant on levels of behavioural intention, social norms, and role legitimacy. PBC-self efficacy and attitude towards ARI had a minimal number of significant demographic effects. Post hoc comparisons showed for example, that allied health professionals tended to have higher mean scores on behavioural intention and attitudes, while nurses tended to have lower scores on PBC-control and sense of role legitimacy. ASBI training tended to show a strong differentiation across most components, with those who reported formal training having higher mean scores on average, compared to those who did not report training. For instance, clinicians who identified no formal screening or BI training, tended to have lower mean scores on social norms, PBC control and self-efficacy, and lower scores on their sense of role

legitimacy. However, these descriptive explorations did not reveal any statistically significant differences, within training groups, on levels of behavioural intention or attitude towards ARI. The following section will provide a detailed discussion of each component in turn.

6.5.2 Multivariate Analyses- ANOVA tests Between Groups

Descriptive explorations revealed significant differences on certain factors such as profession and ASBI training. Individual and joint effects across demographic factors on each of the six components were further explored, using two-way ANOVA. In the following sections, each component will be discussed in turn. A brief description of the individual indicators that make up the composite is provided, as well as examples of the underlying beliefs and constructs measured. Then the results from the relevant analyses (using significant variables detected in univariate table 14) will be presented followed by a short discussion, as a preface to the next sequence of analyses.

6.5.2.a. Attitude towards ARI

Component description: Clinicians' attitudes towards alcohol-related injury, were collectively measured using the composite variable (attitude-ARI), which was derived from summary scores of five items that loaded high on the component. Principal component analysis (section 6.4.2) using oblimin rotation with Kaiser Normalisation, resulted in factor loadings ranging between .430 and .747. These indicators queried agreement on statements about experiences working with ARIs. All but one of these indicators were reversed coded so that, in the original survey, high scores represented strong negative attitudes. For example, clinicians were asked to what extent they believed alcohol-related injury cases were time consuming, and whether they had bad experiences with these types of cases in the ED. This composite variable also included an indicator, probing attitudes on whether clinicians believed ARIs were the result of patients making poor decisions.

Results: Univariate analyses conducted on the attitude-ARI component resulted in significant differences between professions (F (2, 537) = 14.32, p<.01), and group differences according to the number of days since the clinician last encountered an ARI case (F (2, 537) = 4.09, p<.05). A two-way ANOVA was conducted to determine if these main effect differences held across groups. After accounting for days since last encounter using post-hoc comparisons with Tukey HSD test, no significant interactions were observed amongst the independent variables (F (4, 531) = .259, p=.91 eta^2=.002); nor did the last encounter category remain significant (F (2, 531) = 1.52, p=.22 eta^2=.006). However, professional group differences remained significant in the model F (2, 531) = 9.65, p< .001 eta^2=.035). While all professions had significant differences from each other, the biggest mean differences in attitudes were noted between allied health and nursing (mean diff -3.48, SE, .71, p<.01; 95% CI: 5.14—1.81) (table 15).

Table 15: Profession Mean Difference-Attitude

(I) Profession	(J) Profession	Mean Diff (I-J)	SE	p-value	LB	UB
Doctor	Nurse	1.07*	0.36	0.01	0.24	1.91
	Allied Health	-2.41*	0.73	0.00	-4.12	-0.69
Nurse	Allied Health	-3.48*	0.71	0.00	-5.14	-1.81

The error term is Mean Square(Error) = 15.020.
* The mean difference is significant at the .05 level.

Discussion: Univariate differences between professions initially suggested, that there were similar trends in attitudes, the longer the period of time since the clinician last encountered an ARI. For example, those who reported their last ARI encounter was more than a week ago, appeared to have a more positive attitude, compared to those who encountered an ARI within the last 24 hours. Compared to doctors and nurses, allied health were much less likely to agree that alcohol-related injuries were the result of patients making poor decisions. Nurses were more likely to strongly disagree that it has been pleasant to screen and provide brief interventions for alcohol-related problems in the ED.

While the sample as a whole agreed there was not always enough time to conduct ASBI with patients in the ED, nurses most strongly agreed with this belief. These differences amongst profession groups remained significant. However, the amount of time since the clinician last treated someone for an alcohol-related injury, did not reach statistical significance. Individual t-tests were performed between professions to explore effect sizes. The difference between doctors and nurses had a small effect (eta^2=.02) while the difference between allied health and nurses had a moderate effect size (eta^2=.07). Thus, there was a lack of agreement between professions on certain attitudinal indicators, but this difference was not dependent upon the amount of time since the last ARI encounter.

6.5.2.b. Social Norms

Component description: Using confirmatory factor analysis with oblimin rotation initially resulted in six indicators for the social norms component, ranging from .422 to .683. However, the two lowest indicators loading at .422 and .453 were more theoretically congruent with the role legitimacy factor. Thus, the social norms component was revised to sum across four indicators with factor loadings ranging from .593 to .683. This aspect of the original factor loading was taken into account and addressed more specifically within subsequent structural equation modelling (SEM) analyses. The four retained indicators of the social norms component queried clinician perspectives regarding others' expectation to conduct alcohol screening and brief interventions, and whether they believed colleagues thought it was part of their responsibility to address alcohol issues in the ED.

Results: Univariate analyses conducted on the social norms factor suggested differences across the following demographic variables: profession, years worked, screening and brief intervention training (table 14). Analysis of variance was conducted to identify between group differences and to determine which categories remained significant. After including profession and ED-years worked in a 2-way analysis, no interaction effects were observed

and only profession was found to have significant between-group differences F (2, 523) = 6.34, p< .01 eta^2=.024). Within profession differences using post-hoc comparisons revealed a significant mean difference on the social norm component, with doctors having a higher overall mean compared to nurses (mean diff 1.61, SE, .43, p<.01; 95% CI: 0.60—2.62) (table 16). Doctors and nurses were not significantly different from allied health.

In terms of formal screening training, two-way analyses showed group differences were maintained across conditions at significant levels F (2, 531) = 12.24, p< .01 eta^2=.04). Those who reported no screening training had a significantly lower mean compared to both those who reported training (mean diff -4.65, SE, .46, p<.01; 95% CI: -5.73 to -3.57) as well as those who could not recall such training (mean diff -2.55, SE, .58, p<.001; 95% CI: -3.91—-1.18) (table 7). In terms of formal BI training, analyses showed group differences across conditions at similar significant levels. Those who reported no BI training had a significantly lower mean compared to both those who reported training (mean diff -4.47, SE, .45, p<.01; 95% CI: -5.53 to -3.42) as well as those who could not recall such training (mean diff -2.67, SE, .64, p<.01; 95% CI: -4.16 to -1.17) (table 7). No significant interactions were found throughout any of the conducted analyses.

Table 16: Profession & ASBI Training Mean Difference-Social Norms

					95% CI for Mean Diff	
(H) Profession	**(I) Profession**	**Mean Diff (H-I)**	**SE**	**p-value**	**LB**	**UB**
Doctor	Nurse	1.61*	0.43	0.00	0.60	2.62
	Allied Health	-0.08	0.87	1.00	-2.12	1.97
Nurse	Allied Health	-1.69	0.85	0.11	-3.68	0.30
(J) Screen Training	**(K) Screen Training**	**Mean Diff (J-K)**	**SE**	**p-value**	**LB**	**UB**
No	Yes	-4.65*	0.46	0.00	-5.73	-3.57
	Don't Know/Recall	-2.55*	0.58	0.00	-3.91	-1.18
Yes	Don't Know/Recall	2.11*	0.67	0.01	0.53	3.68
(L) BI Training	**(M) BI Training**	**Mean Diff (L-M)**	**SE**	**p-value**	**LB**	**UB**
No	Yes	-4.47*	0.45	0.00	-5.53	-3.42
	Don't Know/Recall	-2.67*	0.64	0.00	-4.16	-1.17
Yes	Don't Know/Recall	1.81*	0.72	0.03	0.13	3.49

Profession: The error term is Mean Square (Error) = 21.939.
Screen/BI Training: The error term is Mean Square (Error) = 17.934.
* The mean difference is significant at the .05 level.

Discussion: Socially normative characteristics were summed using a composite score over four indicators from the survey. Univariate analyses on this composite initially showed

profession, years worked, screening and brief intervention training contained significant group differences. However, all except years worked remained significant after two-way analyses of variances were conducted. This suggested there were no statistically significant within-group differences in perceived social norms based upon the number of years a respondent worked in the ED.

As noted in the other composite measures, profession group differences continued to hold after considering other demographic factors. Similarly, screening and BI training group differences also remained significant, suggesting training may have an important impact on the respondent's perceived expectation to provide interventions for alcohol-related injury. To extend, clinicians who had formal training may have stronger normative beliefs and perceive a higher collegial expectation to screen and provide brief interventions, when encountering an alcohol-related injury, compared to their peers who do not have any formal training.

While not statistically significant, there was a noted downward trend in mean scores across increasing age groups. That is, as clinicians got older, the mean score of social norms continuously decreased, suggesting social norms may not have as great an impact on older clinicians as it would on younger clinicians. This was an observation in the data that had not reached statistical significance, but warranted some notation since this trend was identified in related theoretical and clinical literature.

6.5.2.c. PBC-Control

Component description: Two versions of PBC-Control component were considered in the process of determining the most appropriate composite to represent the final construct. The first version identified by CFA contained five indicators that loaded between -.356 to -.617. The second version included a sixth indicator (Q30) which loaded onto the Control component at -.311 (Q30 simultaneously loaded lowest on behavioural intention at .449). Although Q30 loaded relatively higher on behavioural intention, it was more theoretically

logical to be attached to PBC-Control, which was statistically justified in subsequent analyses that resulted in a higher R^2 change. As such, when behavioural intention was regressed on PBC Control (version I), the explained variance was only 20%, but when regressed on PBC Control (version II), the value increased to an R square change of 26%, both of which were statistically significant. Therefore, all subsequent analyses used the second version to represent the PBC-Control component. This composite variable queried how much clinicians thought the 'decision to perform ASBI' for alcohol-related injuries was up to them, as well as whether they believed 'screening was effective' for detecting risk of future injury. Other control related measures within this composite assessed whether clinicians believed the 'ED was a practical setting' for managing harmful alcohol use, and if was 'easy to perform BIs' in that setting.

Results: Univariate analyses on the PBC-Control factor did not identify significant differences on demographic indicators such as gender, age, years worked or time since last ARI encounter. However, there were indicator differences within profession and screening/BI training. Profession was significant in this regard ($F(2, 533) = 5.45$, $p<.01$ $eta^2=.04$) with doctors and allied health having mean differences with nurses that reached a level of significance (table 17).

Table 17: Profession Mean Difference-PBC-Control

					95% CI for Mean Diff	
(I) Profession	**(J) Profession**	**Mean Diff (I-J)**	**SE**	**p-value**	**LB**	**UB**
Doctor	Nurse	2.29*	0.47	0.00	1.18	3.40
	Allied Health	-0.63	0.97	0.79	-2.92	1.66
Nurse	Allied Health	-2.92*	0.94	0.01	-5.14	-0.70

The error term is Mean Square(Error) = 19.234.
* The mean difference is significant at the .05 level.

Thus, tests of ANOVA were conducted along with post-hoc comparisons, using Tukey HSD test for both profession, and screening or brief intervention training as independent

variables. Subsequent analyses revealed no significant interaction effect between profession and both types of training (F (4, 533) = .75, p=.56), nor did the initial significance in screening training remain after including profession (F (2, 533) = 1.44, p= .24). Profession did remain significant with a small effect size (F (2, 533) = 5.45, p<.01 eta^2=.02). Post-hoc comparisons indicated the mean score for nurses (*M* = 23.41, SD = 5.20) was significantly less than the mean for doctors (*M* = 25.70, SD = 5.38) and allied health (*M* = 26.33, SD = 3.67). Two-way ANOVA were also completed for profession and BI training with similar results, whereby profession group differences remained significant with small effect size, after including BI training in the model (F (2, 533) = 6.25, p<.01 eta^2=.02). While there were mean differences in PBC-Control based on BI training, these differences did not reach significance in the current model.

Discussion: In terms of perceived control to intervene with ARI, profession group, screening, and BI training, did seem to be influential in clinician beliefs. However, stronger differences were observed between profession groups, which remained significant after considering screening/BI training. For example, compared to doctors or allied health, nurses tended to more strongly disagree that, the ED was a practical setting to address individual patterns of harmful alcohol consumption. Nor did nurses think (relative to the other two professions) that, the decision to perform ASBI for injured patients in the ED, was entirely up to them. Doctors and allied health did not significantly differ from each other in their beliefs about the ability of screening to detect risk factors for future injury, however both groups more strongly agreed on this belief compared to nurses. In general, doctors and allied health reported more positive attitudes about the control and use of ASBI, and a stronger sense of control for intervening in alcohol-related injuries compared to nurses. In these preliminary analyses, there were some differences in the composite means on the basis of screening and

brief intervention training, but those differences fell below significance once the profession variable was included in a two-way analysis of variance.

6.5.2.d. PBC-Self Efficacy

Component description: After conducting factor reduction as noted previously, an additional PBC subscale was generated which represented the self-efficacy aspects of perceived behavioural control (PBC-Self Efficacy). Three item with factor loadings ranging from .495 – .795 were combined within this component and measured the ease or difficulty in identifying hazardous or dependent drinking behaviour. This component also assessed clinicians' confidence to appropriately screen and advise injured patients about alcohol harm and risk factors.

Results: Differences were initially observed between group indicators for screening training and time since the last ARI encounter in the ED. Univariate analyses conducted on the PBC subscale of self-efficacy suggested significant differences between screening training ($F (2, 540) = 7.28$, $p<.01$) and significant differences on the last encounter with ARI demographic indicator ($F (2, 540) = 4.18$, $p<.02$). Those who stated they had formal screening training tended to have a higher mean score on self-efficacy indicators (M=13.8, SD=3.02, CI: 13.29-14.41) compared to those who did not have (M=12.6, SD=3.17, CI: 12.30-12.95) or could not recall training (M=13.4, SD=3.03, CI: 12.60-14.14). Likewise, univariate analyses suggested those who reported their last ARI encounter was more than a week ago (relative to completing the survey) tended to have significantly lower self-esteem mean scores (M=12.3, SD=3.17, CI: 11.62-12.88) compared to those whose most recent ARI encounter was within the last 24 hours (M=13.33, SD=3.08, CI: 12.93-13.74). Those who encountered an ARI within the previous week (2-7 days) did not significantly differ (M=12.9, SD=3.18, CI: 12.49-13.33) from either of the other two groups.

Two-way ANOVA were conducted to determine whether the effects of training and last encounter held in the same model. While there was no significant interaction, main effects were examined and found significant (table 18). Specifically, the main effects for screening training (F (2, 534) = 7.15, p<.001 eta^2=.026) and last ARI encounter (F (2, 534) = 3.63, p<.05 eta^2=.013), were both significant with small effects.

Table 18: Screening Training & Last ARI Encounter Mean Difference-PBC-Self Efficacy

					95% CI for Mean Diff	
(J) Screen Training	**(K) Screen Training**	**Mean Diff (J-K)**	**SE**	**p-value**	**LB**	**UB**
No	Yes	-1.23*	0.33	0.00	-2.01	-0.44
	Don't Know/Recall	-0.75	0.43	0.19	-1.75	0.25
Yes	Don't Know/Recall	0.48	0.49	0.59	-0.68	1.63
(L) Last Treat	**(M) Last Treat**	**Mean Diff (L-M)**				
Last 24 hours	Last 2-7 days	0.43	0.30	0.32	-0.27	1.12
	More than 1 week	1.09*	0.37	0.01	0.21	1.96
Last 2-7 days	More than 1 week	0.66	0.38	0.19	-0.22	1.54

Screening/Last Treated ARI: The error term is Mean Square (Error) = 9.656.
* The mean difference is significant at the .05 level.

Discussion: There were significant group differences (p< .01 level) on levels of perceived behavioural control (self-efficacy) in relation to exposure to screening training. Bonferroni post hoc tests compared those who did have formal training to those who stated they did not have any formal screening training (n= 368, 67.8%). Those not trained were less likely to report confidence in their ability to identify hazardous/harmful drinking, and less likely to feel they could effectively screen and advise patients in the ED about drinking and related injury risks. This was based on a statistically significant mean difference of 1.23 between groups (table 18).

Similarly, those who reported a greater amount of time since their last ARI encounter were more likely to report a lower sense of self-efficacy compared to those who dealt with such cases in the last 24 hours. Post hoc tests suggested those who dealt with an alcohol-related injury in the last 24 hours had a 1.09-point higher mean score on self-efficacy associated with perceived control. For example, identifying or distinguishing patients with

hazardous vs dependent use was reportedly more difficult for those who dealt with such cases more than a week prior to taking the survey. However, there was no significant difference in the perceived ability to identify hazardous use between those who encountered an ARI within 2-7 days and those who dealt with such a case more than a week prior to taking the survey. This significance held for both main effects of screening training and ARI encounter across groups and was not dependent upon levels within groups. That is, these group differences did not interact and remained independent of one another, suggesting confidence levels were consistently high for those who had screening training as well as for those who encountered an ARI within the last 24 hours.

6.5.2.e. Role Legitimacy

Component description: A composite factor was developed for role legitimacy using the same procedure as previously mentioned with other factors. There were two items loading on this factor at .422 and .453. They tapped beliefs regarding sense of responsibility to ask injured patients about drinking behaviour and whether clinicians felt an obligation to offer brief interventions for harmful alcohol use.

Results: Differences in a sense of role legitimacy were initially found between professions with doctors (M=10.2, SD=2.21, CI: 9.89 - 10.52) and allied health (M=10.5, SD=1.60, CI: 9.94 - 11.06) reporting a stronger sense of role legitimacy than nurses (M=9.6, SD=2.35, CI: 9.35 - 9.87). In separate analyses, there were also significant differences based on years worked, screening and BI training levels, although the mean differences were small. Two-way analyses were conducted to determine if these main effects differences held between groups across training types. After post-hoc comparisons with Tukey HSD test, it was determined that there was not a significant interaction between profession and training ($F(4, 534) = .220$, $p=.927$), nor did profession have a significant main effect ($F(2, 534) = 1.29$, $p=.277$) with screening training. The effect of screening training remained significant (F (2,

534) = 4.72, p<.01 eta^2=.02), as well as the effect of BI training (F (2, 534) = 6.07, p<.01, eta^2=.02) in the model, although the effect sizes for training were classified as small according to Cohen's (1988) criterion. In a separate analysis, profession did have a significant effect on role legitimacy in a two-way model with the years worked category (table 19).

Table 19: Profession, ASBI Training Mean Difference-Role Legitimacy

					95% CI for Mean Diff	
(H) Profession	**(I) Profession**	**Mean Diff (H-I)**	**SE**	**p-value**	**LB**	**UB**
Doctor	Nurse	0.61*	0.21	0.01	0.13	1.09
	Allied Health	-0.29	0.42	0.77	-1.27	0.69
Nurse	Allied Health	-0.90	0.41	0.07	-1.85	0.05
(J) Screen Training	**(K) Screen Training**	**Mean Diff (J-K)**	**SE**	**p-value**	**LB**	**UB**
No	Yes	-1.27*	0.24	0.00	-1.83	-0.71
	Don't Know/Recall	-0.79*	0.30	0.03	-1.50	-0.07
Yes	Don't Know/Recall	0.48	0.35	0.36	-0.34	1.30
(L) BI Training	**(M) BI Training**	**Mean Diff (L-M)**	**SE**	**p-value**	**LB**	**UB**
No	Yes	-1.15*	0.23	0.00	-1.70	-0.60
	Don't Know/Recall	-0.67	0.33	0.11	-1.46	0.11
Yes	Don't Know/Recall	0.48	0.37	0.41	-0.40	1.36

Profession: The error term is Mean Square(Error) = 5.042.
ScreenTraining: The error term is Mean Square(Error) = 4.868.
BI Training: The error term is Mean Square(Error) = 4.926.
* The mean difference is significant at the .05 level.

Discussion: Profession differences were initially observed with exposure to both formal screening and BI training. Mean differences between groups was noted at p< .001 level, with those having no formal screening or brief intervention training being less likely to feel responsible for asking injured patients about information related to their drinking behaviour. In addition, those without formal training were less inclined to believe it was within their role to offer patients a brief intervention for harmful/hazardous alcohol use.

Professionals did not differ in sense of role legitimacy, after controlling for levels of training. Thus, training may make a difference in terms of whether a clinician, regardless of profession type, is more inclined to feel a role to intervene. That is, screening and brief intervention training may improve sense of role legitimacy, regardless of whether the ED staff was educated as a nurse, doctor, or allied health professional. While years as an ED

clinician did not have a sustained significant effect in these analyses, it was noted that those doctors, nurses and allied health with less than 3 years, tended to have the highest mean amongst all the year categories. This observation was similar to that noted earlier, where older clinicians appeared less affected by the influence of social norms compared to their younger peers. Given age and years worked were likely correlated, and the social norms and role legitimacy components were strongly correlated, there may be shared influences amongst these variables that are revealed with further exploration in SEM analyses.

6.5.2.f. Behavioural Intention

Component description: Clinicians' behavioural intention to intervene with alcohol-related injury was measured using a composite variable derived from summary scores of six indicators that strongly loaded on this factor. Principal component analysis using oblimin rotation with Kaiser Normalisation resulted in factor loadings ranging between .532 and .830. A seventh item (Q30-which asked how worthwhile respondents felt ASBI was) loaded low on this factor, was excluded from the final composite variable and moved to PBC-Control for higher theoretical congruence. The retained indicators assessed interest in receiving training in alcohol screening, brief interventions as well as an ASBI smart phone application. This intention composite also explored support for ASBI as well as whether respondents were inclined to implement SBI if related policies and procedures were made available in their ED.

Results: Initial univariate analyses for behavioural intention suggested significant differences on the following demographic indicators: gender, profession, years worked in the ED and time since last treated an alcohol-related injury. No significant differences in behavioural intention were observed on training indicators. Two-way ANOVA were conducted to assess whether other differences remained after including other demographic factors. For example, after including gender, differences remained between profession groups ($F (2, 537) = 5.20$, $p<.01$ $eta^2=.02$). Post hoc tests (Tukey HSD) identified significant mean

differences between allied health (M=31.59, SD=3.56, CI: 30.35 – 32.83) and both doctors (M=27.51, SD=7.22, CI: 24.68 – 28.53) and nurses (M=28.67, SD=6.43, CI: 27.96 – 29.38). The latter two did not significantly differ from each other (table 11). These same between-profession differences were replicated when gender was replaced with years worked in the two-way model.

Two-way ANOVA were also conducted to identify any reportable differences in categories reflecting years worked as an ED clinician and the last time the respondent encountered an ARI. While the interaction between these two categories was not significant, main effects did remain for years worked: ($F(4, 526) = 8.68$, $p<.01$ $eta^2=.06$), but not last time treated an ARI: ($F(2, 526) = 2.91$, $p>.06$ $eta^2=.01$). Those clinicians with 15.1+ years of work in the ED, had a significantly lower mean score compared to all of the shorter-term groups, although none of the latter were significantly different from each other (table 20). Additional analyses were conducted using permutations of the above variables and there were no significant interactions, nor did any other variables remain significant except profession.

Table 20: Profession & Years Worked in ED Mean Difference-Behavioural Intention

(I) Profession	(J) Profession	Mean Diff (I-J)	SE	p-value	LB	UB
Doctor	Nurse	-1.17	0.60	0.13	-2.58	0.24
	Allied Health	-4.08*	1.22	0.00	-6.95	-1.21
Nurse	Allied Health	-2.92*	1.18	0.04	-5.70	-0.13
(K) TimeED_Clinic	**(L) TimeED_Clinic**	**Mean Diff (K-L)**	**SE**	**p-value**	**LB**	**UB**
15.1+	<= 3.0	-4.95*	0.86	0.00	-7.31	-2.60
	3.1 - 6.0	-3.55*	0.88	0.00	-5.95	-1.15
	6.1 - 10.0	-3.24*	0.89	0.00	-5.68	-0.80
	10.1 - 15.0	-3.01*	0.92	0.01	-5.52	-0.50

Profession: The error term is Mean Square(Error) = 43.092.
Time ED Clinician: The error term is Mean Square(Error) = 41.521.
* The mean difference is significant at the .05 level.

Discussion: The composite score, summed across six indicators for behavioural intention, initially suggested there were differences between demographic indicators such as gender, profession, length of time working as an ED clinician, and recency of encountering an ARI. Group comparisons across categories indicated profession was consistently a factor

for which significant differences remained, after controlling for other demographic variables. In this case, there was a small effect size, and the wider confidence interval may be a result of additional variation within the sample, that occurred through systematic or measurement error. In short, allied health were significantly more likely to report a higher behavioural intention, compared to nurses and doctors, while the latter were not significantly different from the mean response of nurses.

6.5.3 Multivariate Analysis Summary

Descriptive analyses initially detected strong influences from the following demographic indicators: profession; length of time working in the ED; screening training; and, brief intervention training. Less influential were gender, age and the time since the respondent last dealt with an alcohol-related injury. Of the significant indicators, profession and training tended to be consistently influential amongst the detected group differences. For example, relative to nurses, allied health and doctors tended to have higher mean scores on composite variables such as PBC-control and PBC-self efficacy, as well as role legitimacy and social norms. This suggests that, allied health and doctors were more inclined to be optimistic about identifying and distinguishing patients with hazardous or harmful drinking behaviours. In addition, nurses leaned towards less confidence in their ability to screen and advise about the relationship between alcohol use and injury in the ED.

Formal training seems to have had a greater influence on social norms such that, those who reported formal training, exhibit a stronger tendency to comply with perceived social norms. An example of such norms included ‘an expectation to conduct a screening or brief intervention’ when ARIs present to the ED. In this instance, it may be that for those clinicians who have been formally trained, they feel more social pressure to respond with the ASBI skills they possess, and this pressure affects their intention to intervene. This proposition was further supported by the results that showed screening training was also influential in

perceptions of self-efficacy. That is, composite scores for both self-efficacy and social norms varied according to whether or not the clinician reported training, with higher mean scores being associated with those who were formally trained. Conversely, the majority of the sample, which did not report formal training (68%), were less likely to feel adequacy in their role to screen and provide brief advice. Although no demographic interaction effects were observed across components, profession and screening training consistently emerged as main effects within the six composite variables. One exception was the amount of time working in the ED, which was influential in behavioural intention. In this regard, it seemed those who reported working in the ED the longest (15 years or more), tended to have the lowest composite scores compared to their junior colleagues, who did not significantly differ from one another in their average scores. In other words, lower behavioural intention was significantly associated with having worked over 15 years in the ED.

Despite subtle differences based upon chronological factors such as, years worked in the ED, or the time since the respondent last dealt with an ARI, these results imply that the strength of behavioural intention from a demographic perspective, may be more closely associated with inter-professional traits-that is being a nurse, doctor or allied health clinician. However, on its own, profession itself may not be a complete explanatory factor due to the fact there may be unique organisational roles and expectations that further distinguish how professional differences impact upon behavioural intention. For example, while doctors and nurses generally see every patient in the ED setting, allied health professionals such as social workers are often consulted for specific reasons about specific patients. Age and gender at this point, do not seem to influence intention significantly, nor did ASBI training appear to have a direct effect on behavioural intention. Based upon these preliminary analyses, training does seem to have an indirect influence through other exogenous or unobserved factors such as, perceived behavioural control, social norms and role legitimacy.

The conventional regression analyses used at this point were only able to model the direct effects relationships between “observed” variables: item responses. Furthermore, multivariate regression and path analysis approaches, generate large residual statistics to represent measurement error and unexplained variance (Error Sums of Squares). As such, valuable information was lacking about the relationships, and the influences, from unobserved/latent constructs such as behavioural intention. Thus, SEM was determined to be an appropriate next step in the analyses sequence, in order to partition out measurement error, model unobserved or latent variable relationships, and refine the unexplained variance that was uniquely represented by independent variables in the model. Regression analyses were conducted to initiate hypothesis testing, after which whole model tests were conducted using SEM.

6.6 Hypothesis and Post Hoc Testing

The thesis hypotheses proposed in chapter 4, posited that the above components were related in a manner consistent with the conceptual framework modelled in figure 4. That framework outlines the underlying behavioural, and outcome beliefs, associated with each of the five independent variables, which act as antecedents to behavioural intention. The first four hypotheses, specifically address those antecedent relationships between attitudes, social norms, perceived behavioural control (both self-efficacy and control), and the dependent variable, behavioural intention. The fifth and sixth hypotheses, consider the potential moderating effects of underlying beliefs on attitudes and PBC. The seventh hypothesis, proposes that, an interaction effect between the five antecedents, will account for a significant proportion of variance, in behavioural intention to perform SBI for alcohol-related injury. Each hypothesis was tested in turn and where relevant, post hoc tests were conducted to determine the level of influence that might also be uniquely explained by demographic

characteristics. Some minor normality violations occurred as noted in normal P-P plots and scatter plots of standardized residuals. However, according to majority opinions on multivariate analyses, these violations were not considered major threats to validity, nor do statistically significant, skewed distributions in large samples, make a substantive difference in the analysis (513) (p. 80). Collinearity statistics via tolerance and variance inflation factors, confirmed no major violations to assumptions of multicollinearity and homoscedasticity across the hypotheses. A summary of the findings is provided in section 6.6.8.

6.6.1 Hypothesis 1a: Clinician attitude towards ARIs

H1a. Clinician attitude/belief towards people who sustain an alcohol-related injury, will be directly related to the strength of the intention to intervene

Description: As described previously, clinician attitudes were measured using a composite score of five Likert indicators that tapped on beliefs associated with the experiential and instrumental aspects of working with alcohol-related injuries. Behavioural intention measured the degree of willingness to intervene with ARIs, using a composite variable that summed scores across six indicators. In a test of this first hypothesis, hierarchical multiple regression was used, to assess the level of association between clinician attitudes and behavioural intention, while controlling for the influence of significant demographic variables, as identified in univariate analyses (table 14).

Results: Hierarchical regression was conducted to test the hypothesised relationship between behavioural intention and attitudes towards ARI. After conducting preliminary analyses to ensure no major violation of normality assumptions, gender, profession, time as an ED clinician, last ARI encounter and ASBI training were entered at Step 1, explaining 7% of the variance in behavioural intention. At Step 2, the attitude component was entered and the total variance explained by the model as a whole increased to 11%, F (7, 530) = 9.36,

p < .01 (table 21). The attitude measure (β = .20, p < .01) explained an additional 4% of the behavioural intention variance after controlling for demographic factors, R^2 change = .04, F change (1, 530) = 22.15, p < .01. In the final model, only time as ED clinician (β = -.21, p < .01) and profession (β = .10, p < .05) remained significant demographic indicators.

Table 21: Hypothesis 1: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.51	-0.84	1.86	0.69	0.03	0.74	0.46
Profession	**1.18***	0.15	2.22	0.53	0.10	2.25	0.03
Time as ED Clinician	**-0.99***	-1.37	-0.61	0.19	-0.21	-5.12	0.00
Screening Train	0.19	-0.46	0.84	0.33	0.03	0.57	0.57
BI Train	0.01	-0.70	0.71	0.36	0.00	0.02	0.98
Last ARI Encounter	0.49	-0.24	1.22	0.37	0.05	1.31	0.19
Attitude ARI**	**0.33***	0.19	0.46	0.07	0.20	4.71	0.00

**R^2 Δ=.04 (n=540, p<.05*)

Discussion: Hierarchical multiple regression was used to test the hypothesis that clinician attitudes towards people who sustain an alcohol-related injury would be related to the intention to intervene. The analyses resulted in a significant effect of attitude on behavioural intention, after controlling for demographic indicators. However, the overall influence was considered small, based upon an adjusted R^2 factor of .10, which was a 4% increase above the demographic contribution to the model. In this particular sample, it seems that, attitude has not had as great an influence in behavioural intention as identified elsewhere in the literature.

6.6.2 Hypothesis 2a: Clinician perceptions of supervisor/peer approval

H2a. Clinicians who perceive supervisor/peers approve (social norms) of performing SBI in response to alcohol-related injury are more likely to have the intention to implement this practice.

Description: Similar to the other component variables, social norms was constructed using a composite score of several survey indicators. These four items assessed clinicians' perceived expectations from others, to engage in screening and brief interventions associated with ARI. In this test of the hypothesis, the aim was to determine how these normative perceptions may have influenced behavioural intention to intervene.

Results: Following the same protocol to ensure no major normality violations, behavioural intention was regressed on social norms using hierarchical regression in a test of the hypothesis. In Step 1, gender, profession, time as an ED clinician, last ARI encounter and ASBI training were entered, accounting for 7% of the explained behavioural intention variance. In Step 2 of the analysis, the social norms component was entered and the total explained variance increased to 10%, F (7, 530) = 8.36, p< .01. In this case, after controlling for demographic factors, the social norms measure accounted for an additional 3%, which was associated with a statistically significant change in the model, R^2 *change* = .03, F change (1, 530) = 15.69, p < .01. In the final model, time as ED clinician (β = -.20, p < .01), time since last ARI encounter (β = .09, p < .05) and profession (β = .12, p < .05) remained significant control variables (table 22).

Table 22: Hypothesis 2: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.64	-0.72	2.00	0.69	0.04	0.93	0.35
Profession	**1.32***	0.28	2.37	0.53	0.12	2.49	0.01
Time as ED Clinician	**-0.91***	-1.29	-0.53	0.19	-0.20	-4.68	0.00
Screening Train	0.02	-0.65	0.68	0.34	0.00	0.05	0.96
BI Train	-0.15	-0.87	0.56	0.37	-0.02	-0.42	0.67
Last ARI Encounter	**0.80***	0.07	1.54	0.37	0.09	2.15	0.03
Social Norms**	**0.24**	0.12	0.36	0.06	0.17	3.96	0.00

**R^2 Δ=.03 (n=540, p<.05*)

Discussion: It was hypothesised that normative beliefs and the motivation to comply with those beliefs, would be associated with clinician intentions to intervene in alcohol-related injuries. The regression analyses for this hypothesis test resulted in a small, but significant change in the full model. That is, the social norms component increased the overall variance above a partial model that included only demographic characteristics. However, compared to the other components, this explained variance was small. Thus, while some clinicians were motivated to comply with perceived expectations to intervene in ARIs, the overall influence did not appear to be as strong as other factors, such as perceived behavioural control or role legitimacy. This was partly anticipated by the low correlation (.164) social norms had with behavioural intention. The small effect may also be related to an aspect of sampling (100% voluntary participants in an alcohol-injury survey), whereby other factors undermine normative beliefs, such as sincere social concern about the problem.

6.6.3 Hypothesis 3: Clinician belief in SBI efficacy and PBC-control

H3. Clinicians who believe performing SBI will reduce readmission rates to the ED are more likely to intend to intervene with alcohol related injury.

Description: The PBC-Control component was considered in the process of testing this hypothesis. Recall that, of the two PBC subscales, 'Control', had several indicators loading strongly based upon confirmatory factor analysis, using the same extraction method as mentioned for the previous components. Factor loadings on this particular component ranged from -.311 to -.617 across six indicators with strong theoretical congruence. Those survey items queried perceptions of behavioural control such as whether clinicians thought the decision to perform ASBI was entirely up to them, or if they thought BIs were effective for

managing alcohol-related injuries. These indicators also loaded on control beliefs associated with the ease of performing brief interventions for injured ED patients.

Results: Behavioural intention was regressed on both versions of PBC Control to determine whether the sixth indicator increased explanatory value of PBC in the model. In both cases, the partial model, which included only demographic variables, explained 7% of variance in behavioural intention. When the 5-indicator version (I) of PBC Control was entered into the model at step 2, the total variance explained by the model was 28%, F (7, 532) = 29.86, p<.01. In this version, the Control measure explained an additional 20% of the variance in behavioural intention after controlling for gender, profession, time as an ED clinician, ASBI training and time since last ARI encounter, R^2 change = .20, F change (1, 532) = 155.12, p< .01. In contrast, when the 6-indicator version (II), of PBC Control was entered into the model at step 2, the total variance explained by the model was 35%, F (7, 532) = 40.16, p<.01. In this second version, the Control measure explained an additional 27% of the variance in behavioural intention after adjusting for the same demographic variables, R^2 change = .27, F change (1, 532) = 221.95, p< .001. In both full regression models, profession and time as an ED clinician remained significant (table 23).

Table 23: Hypothesis 3: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.81	-0.34	1.97	0.59	0.05	1.38	0.17
Profession	**1.78***	0.89	2.67	0.45	0.15	3.93	0.00
Time as ED Clinician	**-0.91***	-1.23	-0.58	0.17	-0.20	-5.49	0.00
Screening Train	-0.15	-0.71	0.41	0.29	-0.02	-0.53	0.60
BI Train	0.00	-0.60	0.60	0.31	0.00	0.00	1.00
Last ARI Encounter	0.46	-0.17	1.08	0.32	0.05	1.44	0.15
PBC-Control**	**0.66***	0.58	0.75	0.05	0.53	14.90	0.00

**R^2 Δ=.27 (n=542, p<.05*)

Discussion: It was hypothesised that clinician beliefs about performing SBI would be associated with intentions to intervene in alcohol-related injuries. Initially, a mechanical test assessed the utility of a 5- vs 6-indicator component of PBC Control, and results indicated use of the 6-indicator component, was more feasible for subsequent analyses. This component was also theoretically more congruent with the model, and statistically justified based upon a larger R^2 change.

Significant results suggested, clinician perceptions about their ability to exercise any degree of control in an intervention, was strongly associated with their intention to intervene in ARIs. Specifically, after controlling for demographic factors such as profession and time spent as an ED clinician, perceived control increased the explained variance in behavioural intention to 35%. Alone, PBC-Control accounted for 27% of the variance in behavioural intention. This suggests that during the decision-making process to intervene in ARI, clinicians may place substantial weight upon the idea of SBI efficacy, the ease of performing the task, and whether intervening is entirely under their control. This factor was differentially associated within professional groups, such that doctors and allied health were significantly more likely than nurses to feel autonomous control over the decision-making process to intervene. Due to limitations with the statistical tests conducted, directionality was not assessed in these particular analyses. Thus, it was not possible to test more directional hypotheses such as, "low intentions to intervene, would be directly related to strong beliefs that, performing SBI will not reduce readmission rates in the ED".

6.6.4 Hypothesis 4a: Clinician sense of role legitimacy to intervene

H4a. A sense of role legitimacy as an ED professional to intervene in alcohol-related injury is associated with uptake of SBI practice.

Description: A sense of role legitimacy, that is, one's belief that they have a right and responsibility to intervene in ARI, was assessed using the two-factor composite variable described in sections 6.4.2 & 6.5.2e. Multiple regression was used to assess whether this sense of role legitimacy, was associated with uptake of SBI practice and ARI interventions.

Results: Those demographic factors which were significant in univariate analyses were entered in Step 1 to control for potentially influential variables in the model. As previously mentioned, this partial model accounted for 7% of the variance in behavioural intention. After entry of the role legitimacy component in Step 2, the total variance explained by the model as a whole was 29% F (7, 533) = 30.40, p<.01. After controlling for demographic factors, role legitimacy (β = .47, p < .01) explained an additional 21% of the variance in behavioural intention, R squared change = .21, F change (1, 533) = 158.49, p< .01. While accounting for specific demographic characteristics, profession (β = .13, p < .01), and time as an ED clinician (β = -.16, p < .01) remained significant in the full model (table 24). Post hoc tests for profession showed allied health had significantly higher mean scores compared to doctors and nurses (table 25). Those who reported working longer in the ED (15 or more years), appeared to have significantly lower mean scores on behavioural intention, compared to more junior clinicians.

Table 24: Hypothesis 4: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.71	-0.49	1.92	0.61	0.05	1.16	0.25
Profession	**1.47***	0.54	2.40	0.47	0.13	3.12	0.00
Time as ED Clinician	**-0.74***	-1.08	-0.40	0.17	-0.16	-4.28	0.00
Screening Train	-0.14	-0.72	0.45	0.30	-0.02	-0.46	0.65
BI Train	-0.18	-0.81	0.45	0.32	-0.02	-0.56	0.58
Last ARI Encounter	0.59	-0.06	1.24	0.33	0.07	1.79	0.07
Role Legitimacy**	**1.37***	1.16	1.59	0.11	0.47	12.59	0.00

**R^2 Δ=.21 (n=543, p<.05*)

Table 25: Hypothesis 4: Profession & Time Worked in ED Mean Difference

					95% CI for Mean Diff	
(I) Profession	**(J) Profession**	**Mean Diff (I-J)**	**SE**	**p-value**	**LB**	**UB**
Doctor	Nurse	-1.16*	0.51	0.03	-2.17	-0.15
	Allied Health	-4.08*	1.04	0.00	-6.14	-2.03
Nurse	Allied Health	-2.93*	1.01	0.00	-4.92	-0.93
TimeED_Clinic	**(L) TimeED_Clinic**	**Mean Diff (K-L)**	**SE**	**p-value**	**LB**	**UB**
15.1+	<= 3.0	-4.95*	0.75	0.00	-6.42	-3.48
	3.1 - 6.0	-3.55*	0.76	0.00	-5.05	-2.05
	6.1 - 10.0	-3.24*	0.78	0.00	-4.77	-1.72
	10.1 - 15.0	-3.01*	0.80	0.00	-4.58	-1.44

The error term is Mean Square(Error) = 31.52.

* The mean difference is significant at the .05 level.

Discussion: Hierarchical multiple regression was conducted to test the hypothesis that a sense of role legitimacy, was associated with the intention to take up SBI practice. The two-item composite, tapped beliefs associated with sense of responsibility to ask about drinking behaviour, and the sense of obligation to provide brief interventions, when managing alcohol-related injury. After controlling for demographic measures, such as ASBI training and the recency of one's last ARI encounter, it appears a sense of role legitimacy did significantly contribute to intention. Specifically, 21% of the variance in intention was explained by clinicians' sense of having a legitimate role to intervene and provide SBI. In this regard, allied health and doctors demonstrated higher behavioural intention, based on a stronger sense of role legitimacy to intervene in ARIs, compared with nurses.

Thus, a belief that one has the obligation and the right to address alcohol-related injuries appears to have a substantial influence on the adoption of screening practice, and subsequent intervention intentions. However, similar to previous analyses, this test of the hypothesis did not employ a directional measure, which reduced the ability to determine if a lower sense of role legitimacy is correlated with poor uptake of SBI practices. It may be that there is a certain level of role-specific support that is necessary, but not itself sufficient, to improve motivation around ARI responses.

6.6.5 Hypothesis 5: Clinician perceived behavioural control-self efficacy

H5. Perceived behavioural control (self-efficacy) to perform SBI will have a moderating effect on the intention to intervene.

Description: Of the two sub-components of PBC, self-efficacy measured clinician confidence and perceptions about their individual ability to recognise and distinguish the difference between hazardous alcohol use and dependent drinking. This hypothesis examined how such clinician self-beliefs, might influence their willingness to intervene in alcohol-related injuries in the ED.

Results: Behavioural intention was regressed on PBC-self efficacy in Step 2 of a hierarchical model. As with all previous examples, the partial model that included only demographic variables accounted for 7% of the behavioural intention variance. Once included in the full model, self-efficacy ($\beta = .11$, $p < .01$) only contributed an additional 1% thus making the total variance explained less than 10% F (7, 533) = 6.93, p<.001. Although significant, the additional variance provided by self-efficacy in this model was minimal, R squared change = .01, F change (1, 533) = 6.16, p< .01 (table 26).

Table 26: Hypothesis 5: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.60	-0.77	1.97	0.70	0.04	0.86	0.39
Profession	**1.22***	0.17	2.27	0.53	0.11	2.28	0.02
Time as ED Clinician	**-0.93***	-1.32	-0.55	0.20	-0.20	-4.77	0.00
Screening Train	0.13	-0.54	0.79	0.34	0.02	0.37	0.71
BI Train	0.06	-0.66	0.77	0.36	0.01	0.16	0.87
Last ARI Encounter	**0.82***	0.08	1.56	0.38	0.09	2.16	0.03
PBC-Self efficacy**	**0.22***	0.05	0.40	0.09	0.11	2.48	0.01

**R^2 Δ=.01 (n=543, p<.05*)

Discussion: It was hypothesised that clinician beliefs about their ability to identify hazardous or harmful drinking, would influence SBI intentional practice. The results

suggested that, clinician perceptions about their confidence had a small impact on their stated intentions. That is, individual confidence to appropriately screen and advise ED patients, about the connections between alcohol and injury risk factors, appears to be minimally associated with behavioural intentions in this sample. Because these tests of the hypothesis did not differentiate between profession groups, time since last ARI encounter, and the time as an ED clinician (all of which were significant) it is not certain, for example, whether self-efficacy is more important for nurses, who have worked in the ED for a shorter period time. Furthermore, it is possible that self-efficacy interacts with perceived control to influence behavioural intention, which will require additional tests to determine if that relationship is mediational, or moderating. In short, these results suggest that in weighing intentions, clinicians may minimally call upon self-efficacy to build their motivation in managing ARIs.

6.6.6 Hypothesis 6: Variance in behavioural intention and perceived barriers

H6. A proportion of the observed variance in behavioural intention to perform SBI can be accounted for by perceived barriers in the form of heavy workload and limited resources in the ED.

Description: The original six components derived from confirmatory factor analysis, had been used to test all hypotheses that were specific to major constructs in the conceptual framework, except one. This exception, Perceived Barriers, was based upon much of the reviewed literature on clinician behaviour, and is used in the current hypothesis. It suggests that, in addition to the core constructs, a proportion of the observed variance in the intention to intervene could be explained by additional barriers such as perceived heavy workloads and limited ED resources. Thus, an additional composite variable was constructed from survey items (Q19, Q31 and Q35), to represent these barriers. Two of these items (Q19 and Q35)

originally loaded on the attitude component while the other (Q31) previously loaded on social norms.

Results: The zero-order correlation of this new component with behavioural intention was quite small (β = .07, t=1.53, p= .13) and not significant. There was no additional explained variance above a partial model (demographic variables only) nor was there any significant *F* change between partial and full models (Perceived Barriers construct added), *R* squared change = .00, *F* change (1, 531) = 2.35, p= .13. Profession and time as ED clinician remained significant throughout (table 27). Therefore, no additional analyses were performed for this hypothesis.

Table 27: Hypothesis 6: Analysis Summary

	B	95% CI for B		SE B	ß	t	Sig.*
Gender	0.57	-0.81	1.95	0.70	0.04	0.81	0.42
Profession	**1.22**	0.17	2.28	0.54	0.11	2.28	0.02
Time as ED Clinician	**-0.97**	-1.35	-0.58	0.20	-0.21	-4.92	0.00
Screening Train	0.17	-0.50	0.83	0.34	0.02	0.49	0.62
BI Train	0.01	-0.71	0.73	0.37	0.00	0.02	0.98
Last ARI Encounter	0.68	-0.06	1.42	0.38	0.08	1.82	0.07
Perceived Barriers**	0.16	-0.04	0.35	0.10	0.07	1.53	0.13

**R^2 Δ=.00 (n=541, p>.05*)

Discussion: Amongst the original hypotheses, it was proposed that other unaccounted factors, in the form of perceived barriers, were likely to account for additional variation in behavioural intentions. This was based upon findings from previous research (518), as well as results from the qualitative project within this thesis. Limited time was considered a barrier in that it contributed to the perception of a heavy workload, in addition to the lack of tangible resources such as alcohol screening tools or brief intervention protocols. These perceived barriers which emerged during the qualitative, were hypothesised to account for variance, above and beyond what might have been captured by the main conceptual framework.

However, it should be noted that the items used to form this perceived barriers composite, were taken from two components derived from the original confirmatory factor analysis. Given this component did not explain any additional variance, it is likely that this composite in its current form was superfluous. That is, the perceived barriers alluded to in other research and the qualitative project, were already adequately captured in the model through the existing composite variables (viz, attitudes and social norms). Therefore, this hypothesis was not supported.

6.6.7 Hypothesis 7: Combined interaction effects of model constructs

H7. The combined (interaction) effects of attitudes, social norms, perceived behavioural control and role legitimacy, account for a significant proportion of the explained variance, in behavioural intention to perform SBI for alcohol-related injury, amongst ED staff.

Description: The hypothesis posited that a collective contribution from all the previously tested composite variables, would account for a significant amount of the variance in behavioural intention amongst ED staff. The implicit research question is, 'how well do the collective exogenous/independent variables in their current composite forms, explain the overall variance of behavioural intention, above any demographic factors'?

Results: Hierarchical multiple regression was used to assess ability of the various composite factors, including an interaction term, to predict levels of behavioural intention, while controlling for the significant demographic factors identified in univariate analyses. Those demographics included gender, profession, years worked in the ED, screening and BI training, as well as time since last ARI encounter. Preliminary analyses did identify violation of normality assumptions, whereby response data were skewed. However, this did not raise major concerns in the interpretation of results, given the large sample size and the analyses used, which were robust and not sensitive to this violation. No major violations were

observed for assumptions of linearity, multicollinearity, nor homoscedasticity. An additional variable (independents-interact) was computed to account for the interaction term. This variable was a multiplicative factor of attitude, social norms, PBC-Control, PBC-self-efficacy, and role legitimacy.

At Step 1, the demographic factors were entered, and explained 7% of the variance in behavioural intention. After entry of the five composite factors at Step 2, an additional 35% of the variance was explained by the model (F (11, 523) = 33.92, p<.001). At Step 3, the interaction term was entered, and increased the total variance to 43% (F (12, 522) = 32.12, p<.001). The total variance explained in Step 2 was 42%, which increased by 1% in Step 3. All three steps, resulted in statistically significant contributions as shown by the changes in R^2 across the models (table 28). Parameter estimates, along with confidence intervals, are presented in table 29. In the final model, both profession (beta= .14) and years worked in the ED (β = -.17), remained significant, with the following independent parameter estimates: PBC control (β = .47, p<.001) role legitimacy (β =.35, p<.001). Years worked was disaggregated to identify how length of ED experience factored around the mean difference (table 30).

Table 28: Hypothesis 7-Sequential regression and R2 change for interaction effect

					Change Statistics				
MODEL	**R**	**R^2**	**Adjusted-R^2**	**S.E. Estimate**	**$R^2\Delta$**	**FΔ**	**df1**	**df2**	**Sig. FΔ**
1	0.27	0.07	0.06	6.44	0.07	6.94	6.00	530.00	0.00
2	0.65	0.42	0.40	5.13	0.34	61.82	5.00	525.00	0.00
3	0.65	0.43	0.41	5.10	0.01	7.59	1.00	522.00	0.01

Table 29: Behavioural intention-regression analysis summary at Step 3

		B	**95% CI for B**		**SE B**	**ß**	**t**	**Sig.***
STEP 3	Gender	0.89	-0.21	1.99	0.56	0.06	1.59	0.11
	Profession	**1.67***	0.82	2.51	0.43	0.14	3.86	0.00
	Time as ED Clinician	**-0.79***	-1.10	-0.48	0.16	-0.17	-5.00	0.00
	Screening Train	-0.19	-0.72	0.35	0.27	-0.03	-0.68	0.50
	BI Train	-0.02	-0.60	0.56	0.29	0.00	-0.08	0.94
	Last ARI Encounter	0.34	-0.26	0.94	0.31	0.04	1.12	0.27
	Attitude ARI	0.12	-0.03	0.27	0.08	0.07	1.60	0.11
	Social Norms	0.01	-0.13	0.14	0.07	0.00	0.09	0.93
	PBC_Control	**0.58***	0.47	0.69	0.06	0.47	10.52	0.00
	PBC_Self Efficacy	0.05	-0.12	0.22	0.09	0.02	0.57	0.57
	Role Legitimacy	**1.03***	0.79	1.27	0.12	0.35	8.42	0.00
	Composite Interaction	**-.20 e-5***	-.40 e-5*	-6.21 e-7	7.85 e-7	-0.21	-2.76	0.01

*Signif at .05 level

Table 30: Mean comparisons (Years Worked in ED) on behavioural intention at Step 3

					95% CI for Mean		Scale Response	
Years Worked as ED Clinician	**N**	**Mean**	**SD**	**SE**	**LB**	**UB**	**min**	**max**
<= 3.0	123	30.35	5.79	0.52	29.32	31.38	13	40
3.1 - 6.0	114	28.95	5.94	0.56	27.84	30.05	12	41
6.1 - 10.0	106	28.64	6.58	0.64	27.38	29.91	6	41
10.1 - 15.0	95	28.41	6.74	0.69	27.04	29.78	9	41
15.1+	103	25.40	7.42	0.73	23.95	26.85	8	40
Total	541	28.44	6.66	0.29	27.87	29.00	6	41

Discussion: A test of the hypothesis that a composite variable interaction would account for a significant proportion of the explained variance in behavioural intention was supported by evidence that showed a sequential increase in the R^2 change, across three models. In fact, the final model generated greater parsimony, with 43% (adjusted R^2 = .41) of the variance explained by just two significant composite variables (PBC control and role legitimacy), two demographic indicators (profession and years worked in the ED) and the interaction term. While social norms was just as significance in Step 2, it did not maintain a level of significance in Step 3, which suggested the interaction term may better account for the normative effect. As shown in table 29, the interactive term has a very small, but significant unstandardized coefficient as a result of the analyses conducted using SPSS. This specific analysis was conducted, in order to identify if indeed a test of the hypothesis, could generate preliminary evidence to support the proposition. Given this initial support, more interpretable results of the interaction term could be obtained using advanced analyses.

Within demographic characteristics, mean behavioural intention sequentially decreased with increasing years worked. The senior group (15+ years) was significantly lower in behavioural intention, compared to all other groups, with the biggest difference occurring between the most senior, and the most junior clinicians. Given there were no significant differences across group sizes, there was a notably higher minimum response on the scale

items, for the most junior cohort, suggestive of a higher behavioural intention, even at the individual level table 30.

6.6.8 Hypotheses Summary

Tests of the hypotheses in the preceding sections provided supporting evidence for relationships between construct variables, in most instances. Those relationships were indicative of a theoretical framework that conceptualised behavioural intention, based upon a number of antecedent variables. A list of change statistics for each hypothesis model is located in table 31, and a comprehensive summary of all tests along with evidence of support is located in table 32. For example, in the first hypothesis, attitudes in isolation, appeared to have a small, but significant effect upon behavioural intention (R2 change = .11). This is consistent with literature that suggests attitudes can be influential in professionals' decision-making, and the uptake of evidence-based practice (140, 263). However, there may be sociodemographic, cultural, and other features unique to this Australian sample, and changes that might occur over different times when studies are conducted, that inform the strength of attitudinal influences. For example, in a European context, attitudinal influences as measured by therapeutic commitment, did not have a significant relationship with ASBI rates (519). This does raise concern about measurement effects and methodological factors that may equally explain the observed variations with this, and other studies.

Table 31: Hypotheses explained variance and change statistics

						Change Statistics				
Model	**Component-Variable**	**R**	**R^2**	**Adjusted-R^2**	**S.E. Estimate**	**$R^2\Delta$**	**FΔ**	**df1**	**df2**	**Sig. FΔ**
Partial	Demographics	0.27	0.07	0.06	6.44	0.07	6.98	6	533	0.00
H1a	Attitude ARI	0.33	0.11	0.10	6.31	0.04	22.15	1	530	0.00
H2a	Social Norms	0.32	0.10	0.09	6.35	0.03	15.69	1	530	0.00
H3	PBC_Control	0.59	0.35	0.34	5.41	0.27	221.95	1	532	0.00
H4	Role Legitimacy	0.53	0.29	0.28	5.66	0.21	158.49	1	533	0.00
H5	PBC-Self Efficacy	0.29	0.08	0.07	6.41	0.01	6.16	1	533	0.01
H6	Perceived Barriers	0.28	0.08	0.07	6.43	0.00	2.35	1	531	0.13
H7	Additive Effect	0.65	0.42	0.40	5.13	0.34	61.82	5	525	0.00
H7	Interactive Effect	0.65	0.43	0.41	5.10	0.01	7.59	1	522	0.01

There was support for the propositions made about social norms (hypothesis 2a) and PBC-self efficacy (hypothesis 3), in relation to their explained contributions to behavioural intention. Both of these constructs were significantly correlated with behavioural intention, but likewise, tended to make limited contributions to the overall variance. As it stands, this particular sample of ED clinicians may not be heavily influenced by the expectations of others', nor feel exceptional pressure from managers or colleagues, to intervene. Such perceptions resonate with the findings from the focus groups, as discussed in section 5.6.2.

Table 32: Hypotheses Summary Table-Supporting Evidence

Mediation	*Evidence*	*Supported?*	*Component (exo)*	*Component (endo)*
H1a. Clinician attitude/belief towards people who sustain an alcohol-related injury, will be directly related to the strength of the intention to intervene	4% additional explained variance in behavioural intention (β = .20, p < .01)	**YES**	**ATT_ARI**	**BEH INT**
H2a. Clinicians who perceive supervisor/peers approve of performing SBI, in response to alcohol-related injury, are more likely to have the intention to implement this practice	3% additional explained variance in behavioural intention (β = .17, p < .01)	**YES**	**SOC_NORM**	**BEH INT**
H3. Clinicians who believe performing SBI will reduce readmission rates to the ED, are more likely to intend to intervene with alcohol related injury	27% additional explained variance in behavioural intention (β = .53 p < .01)	**YES**	**PBC_CONTROL**	**BEH INT**
H4a. A sense of role legitimacy as an ED professional to intervene in alcohol-related injury, is associated with uptake of SBI practice	21% additional explained variance in behavioural intention (β = .47, p < .01)	**YES**	**ROLE LEG**	**BEH INT**
Moderation	*Evidence*	*Supported?*	*Component (exo)*	*Component (endo)*
H5. Perceived behavioural control (self-efficacy) to perform SBI will have a moderating effect on the intention to intervene	1% additional explained variance in behavioural intention (β = .11, p < .01)	**YES-ONLY MEDIATING**	**PBC_SE**	**BEH INT**
H6. A proportion of the observed variance in behavioural intention to perform SBI, can be accounted for by perceived barriers in the form of heavy workload and limited resources in the ED	0% additional explained variance in behavioural intention (β = .07, p >.05)	**NO**	**PERCEIVED BARRIERS**	**BEH INT**
Interaction	*Evidence*	*Supported?*	*Component (exo)*	*Component (endo)*
H7. The combined, interactive effects of attitudes, social norms, perceived behavioural control and role legitimacy, account for a significant proportion of the explained variance in behavioural intention, to perform SBI for alcohol-related injury amongst ED staff	43% overall explained variance in behavioural intention ($R^2\Delta$ = ..35, p < .01)	**YES**	**PBC_CONTROL** **ROLE LEG** **PBC_SE** **SOC_NORM**	**BEH INT**

Self-efficacy was one of two subcomponents resulting from parcelling the perceived behavioural control construct. The second component, Control (hypothesis 4a) had a much stronger correlation with behavioural intention, and demonstrated a greater contribution to the overall explained variance. In that instance, results suggested the perceived degree of control over one's actions (i.e. implementing ASBI) explained 27% of the variance (the highest contribution) in planned behavioural intention. Thus, a clinician's interest/intent in taking up screening training, or using a smart phone application for ASBI, was influenced by the degree of control they felt they could exercise in such actions. This variance also took into account, how much the clinician agreed that brief interventions were effective for managing ARIs. In that regard, those who believed screening would not detect risk of future injury, or that it was too difficult to perform BIs in the ED, were less likely to endorse a strong intention to act on the behaviour. In other words, those who perceived little control over their action and faced difficulty doing so, tended to express less commitment to the action. This aspect of intention was determined to be differentially associated with professions such that doctors and allied health were more likely than nurses to endorse autonomy in the process of intervening.

The sense of role legitimacy, as an ED clinician to intervene in ARIs (hypothesis 4a), had the next highest correlation with behavioural intention. A test of the hypothesis provided evidence to support the proposition that ASBI uptake would be associated with role legitimacy. Thus, when the clinician had a strong sense of legitimacy to intervene, there was an increased intent to intervene. This effect was differentially associated within professions such that, allied health had higher mean scores on behavioural intention, relative to doctors, who had higher scores relative to nurses. In this regard, it may be that expectations generated from the organisation of roles in the ED has an unspecified influence that was not readily captured in these analyses. That is, between profession differences of these types may be more a result of the internal arrangements of roles and the assigned responsibilities, and less

an innate feature of any given profession. Thus, while the analyses suggest allied health as a group had the strongest sense of role legitimacy and nurses the lowest, this may not be an inherent profession-based quality. It may be more of the consultative role assigned to allied health to see select patients, whereas doctors and nurses in the ED are generally expected to treat every presenting patient, which might result in the varied perspectives on sense of role legitimacy.

Years worked in the ED was also differentially associated in that junior clinicians endorsed higher intention relative to clinicians with more than 15 years of ED experience. However, the tests conducted, did not measure whether this characteristic was commensurate with time: meaning it was unclear whether the amount of behavioural intention decreased the longer one worked in the ED or perhaps related to changes in nature, intensity and effectiveness of training provided over time or perceived changes in expectations over time.

The sixth hypothesis proposed that variance in behavioural intention can be accounted for based upon perceived barriers such as, heavy workloads and limited resources. The composite variable developed for this hypothesis (perceived barriers), was constructed from three items of two previously tested components. Perceived barriers was very weakly associated with behavioural intention, and did not significantly contribute to the explained variance above any demographic characteristics. Thus, while there was not enough evidence to support this hypothesis, a number of factors suggest this result should be cautiously considered. First, the composite measure was not highly correlated with the outcome measure, nor was it likely to be highly representative of the construct of concern. Two items within this composite assessed time factors, and one item assessed awareness of screening tools in the ED. These may not have been accurate indicators of the heavy workload and limited resources that may contribute to perceptions about barriers in the ED environment. Notwithstanding, it was important to consider a perceived barriers hypothesis, based upon the

ED research literature, which shows workload and resource challenges potentially impact motivation and implementation of evidence-based practice (168, 520).

A test of the final hypothesis resulted in evidence supporting the proposition that, the interactive effects of all composite variables accounts for a significant proportion of the variance explained in behavioural intention. This test used hierarchical linear regression to assess the contribution of both the additive, and the multiplicative effects, of the six composite variables in explaining the observed differences in levels of behavioural intention. The additive contribution increased the overall explained variance by 34%, while the multiplicative effect added an additional 1%. However, this last effect resulted in a more parsimonious model, and was a preliminary test to confirm the interaction effect. The reported parameter estimates of the interaction were very small, and therefore not the most accurate report of this effect. Nevertheless, this test did provide justification to further explore the interaction effect, with more complex analyses. That is, the regression analyses used for this particular test was a less reliable procedure to determine an interaction effect. This is due to the fact that SPSS uses means and standard deviations to compute estimates, which is a less robust estimation method. More reliable and accurate estimates should be obtained from structural equation modelling (SEM), which uses a superior estimation method, by generating calculations from multiple processes (generalised least squares-GLS; maximum likelihood estimation-MLE, etc.) (521). In addition, weighted-least squares (WLS) estimation is used, which requires a large sample size, resulting in an asymptotically distribution-free (ADF) estimator, that does not depend on a normality assumption (522). Notwithstanding, the hierarchical regression was a necessary 'first step', to determine if there were interaction effects at the full-model level. Thus what follows, is a reasonable next-step to disentangle the observed relationships further, using SEM.

CHAPTER 7. STRUCTURAL EQUATION MODELLING (SEM)

7.1 Introduction and Overview of SEM

The Theory of Planned Behaviour (TPB) has been regarded as a significant social cognitive model that proposes to explain variance in volitional behaviour. As discussed throughout chapter three, the intention to act is hypothesised to be the most proximal predictor of behaviour, and that intention mediates the relationship, between behaviour and three judgment constructs: attitudes; social norms; and, perceived behavioural control. While there has been a plethora of TPB studies attempting to account for variance in behaviour, meta-analyses have indicated a substantial proportion of the variance remains unmeasured (393, 405). This unaccounted residual variance may exist in other unmeasured variables, which questions the parsimony of one of the most tested, and referenced social cognitive models in health.

Structural equation modelling (SEM) has been used throughout health research to deconstruct unexplained residual variance, by identifying unexamined correlations and covariances between constructs (522). In this thesis, those constructs or components were represented by latent variables, which were in turn estimated by the factored indicators extracted from the scale items in the ED-ARI survey. Taken together, the first-order latent variables, derived from the observed (survey) data have been modelled in a path diagram, using higher-order global variables (theoretical constructs), while simultaneously accounting for the unmeasured structural relationships (or equations) between constructs. In this manner, it was possible to establish parsimony in the theoretical model, and build a more robust and reliable structure to account for variance in behavioural intention. This was in an attempt to answer two central research questions: “What characteristics in the ED clinician population, contribute to variations in behavioural intention to provide ASBI for alcohol-related injuries?” and, “Can the proposed conceptual model, adequately explain the observed relationships between variables?”

The successive sections follow on from previous chapters, by providing a culminating perspective of the theory and conceptual framework, enhanced by a practical application of SEM. They begin with a section on model specification, which involved determining all the relationships and parameters in the model. In the next section, model identification was used to resolve any identification problems, as well as locate a unique set of parameter estimates. Model identification was based upon the sample covariance matrix, and the implied theoretical model. This step resolved the possibility that more than one unique set of parameter estimates exists, by imposing constraints on the model. The third section, model estimation, used *fitting functions* to minimise the difference between the sample matrix and the theoretical matrix. Those *functions* used multiple estimation methods, to resolve discrepancies between what was observed in the data, and what was implied by the theory, to 'fit' a model that accurately represented the data. This ultimately remedied standard error and chi-square tests that may not have been as robust due to non-normal distributions, and the ordinal-scaled data. After obtaining parameter estimates, model testing was conducted to determine how well the data fit the model. That is, to what extent did the survey data support the theoretical model. Model fit criteria were examined using a number of robust fit indices. Finally, a section is devoted to model modification, whereby the implied model fit that was weak, was re-evaluated using statistical output to improve the overall fit, as well as guide re-specification where required. The outcome was a well-fitting model, using the survey data, which increased the amount of explained variance in behavioural intention, to provide SBI for ARI. SPSS AMOS v23 was used to conduct all SEM procedures.

7.2 Model Specification

The first phase of the SEM process involved conceptualising the model, based upon an appropriate theory that adequately explained the variables to be measured. An aspect of this phase was conducted throughout the first three chapters, which provided a critical analysis of

the literature. Distilled from that analysis was an identification of the problem, the nature of the problem response, and the theoretical perspective that could potentially enhance that response. This was summarised by the conceptual framework and the associated hypotheses identified in chapter four (figure 4). The framework was built around a path diagram that illustrated the latent variable relationships and the measurement scheme associated with behavioural intention.

The structural considerations identified five exogenous/independent variables (attitude, social norms, role legitimacy and PBC-control/self-efficacy), and one endogenous/dependent variable (behavioural intention). All of these unobserved components are latent variables in SEM terminology. The measurement considerations involved identifying the observable indicators (survey items) that best represented the latent variables. These were confirmed using regression and factor analyses in chapter 6. These indicators were then applied to the overall model as partial measures of the latent variables. Based upon the previous research and literature it was judged that the necessary variables were included in the model and thus, minimised any bias occurring from specification error. However, this could not be fully determined until the model testing phase.

7.3 Model Identification

Indeterminacy is the possibility that more than one implied theoretical model can be equally fit to the data. This occurs when there are more unknown than known pieces of information. To fix this identification problem, constraints were imposed on parameters so that some were free and some fixed to 1. This allowed for a unique set of parameters to be identified, and ensured that there were more known pieces of information than unknown. One method to achieve this was to make the structural model recursive so that all structural relationships were unidirectional. A second method was to fix the factor loading of one

indicator, per latent variable, to 1. The third method was to develop a parsimonious model by including only crucial variables (parameters).

The "t-rule" was applied as another necessary, but not sufficient condition during the model identification process. This rule states that the number of parameters to be estimated in the model, cannot exceed the number of unique variances and covariances in the sample variance-covariance matrix (523). As a minimum, this rule was applied to every model prior to estimation, because without it, estimation was not possible. In the full model, there were 59 variables in total (26 observed, and 33 unobserved). The *t*-rule states:

$$t \leq p\,(p + 1)/2$$

where *t* is the number of free parameters to be estimated (92), and *p* is the number of observed variables (26). Thus, *t* was less than the number of distinct sample moments (351). From this equation, the degrees of freedom was also calculated (df = 351-92 = 259). In this case, the *t*-rule was met and identification was possible.

7.4 Model Estimation

This step of the modelling process generated estimates for each of the parameters in the model that produced the implied matrix. The aim was for the implied matrix to yield values as close as possible to the sample covariance matrix obtained by the indicators of the survey data. The estimation process involved several *fitting* functions that assessed the degree of overlap between the two matrices, such that the difference amongst elements contained in each matrix would approximate zero. Those fitting functions acted as discrepancy measures to assess: model fit; residuals; comparative fits; and, indices of model parsimony. For example, the χ^2 statistic assessed model fit through a test of the alternative hypothesis that, there was no significant difference between the theoretical and the sample matrices. Thus, it was expected that good model fit would result in a non-significant χ^2. Another fit statistic used was the root mean-square error of approximation (RMSEA). This index measured the

same discrepancy by taking into account the error of approximation in the population, and relaxes the stringent requirement of the χ^2 that the model holds exactly in the population. In short, RMSEA is a measure of the discrepancy per degree of freedom, after diminishing the discrepancy as a function of the sample size. The acceptable level for RMSEA is less than 0.05. Browne & Cudeck (1993) recommended a test of the hypothesis that RMSEA ≤ 0.05 (called PCLOSE). That is, PCLOSE is the p-value for testing the hypothesis that RMSEA = 0 (an exact fit). If PCLOSE > 0.05, the close fit hypothesis is accepted (524).

Two incremental indices assessed how much better the fitted model compared to a baseline model: Goodness-of-Fit (GFI), and Adjusted Goodness-of-Fit (AGFI). These indices typically lie between zero (0) and one (1), where zero indicates the specified model is no better than the baseline model, while an index of one indicates the specified model is a perfect fit. Both GFI and AGFI are similar except that the latter adjusts for the degrees of freedom for the model. Acceptable levels for GFI and AGFI are greater than 0.90. The Comparative Fit Index (CFI), and the Tucker-Lewis Index (TLI), are two additional incremental fit indices that provided information on how well the model compared to baseline. The CFI is similar to the TLI, except that the former is constrained to fall between 0 and 1, but both have acceptable levels above 0.90. Values greater than 1 for the TLI may indicate overfit due to an excess of parameters requiring estimation.

Latent variables were scaled with the reference variable that best described the construct; the reference indicator that correlated highest with the construct. Fixing this factor loading ensured the latent variable was measured on the same scale as the reference variable. For example, an early version of the model used six indicators on behavioural intention to reflect the measurement of that construct. An indicator (Q43) was initially used as the fixed-factor loading (i.e. constrained to 1), but subsequent fit indices suggested the highest loading indicator (Q43) should be fixed. This was also done for an indicator on PBC-Control, to

improve the estimation capacity of the model. Estimates for the first model are presented in table 33. The *β* weights are factor loadings of survey items on their respective latent variable constructs. For example, questions 43, 42 and 33 loaded on behavioural intention at .66, .71, and .63 respectively. All factor loading estimates were significant (with the exception of Q40 on PBC-Control; this was addressed in the modification step as mentioned earlier), which was in agreement with the principal components, and confirmatory factor analyses discussed in chapter six.

A number of estimation methods were executed during this step to identify and reduce any discrepancies between matrices, as well as cross check output between the various methods. The primary method was maximum likelihood estimation (MLE), but the model was also trialled using generalised least squares (GLS) and unweighted least squares (ULS). The last two estimation methods are not limited by normality assumptions, however the estimates produced by all three were similar. The MLE method was therefore used for subsequent analyses since its normality assumptions were not as sensitive to any distributional effects of the data. At this step, sample regression weights were computed for independent predictor variables, without modifications. These initial estimates (*β* = standardised regression weights for structural variables) were generally lacking significance with critical ratios below the 1.95 level of acceptance. In particular, the regression weights for all exogenous variables predicting behavioural intention failed to achieve a level of significance. This is common during the initial fit of a structural model, due to specification and identification inaccuracies with theoretical models and normal variations within observed data. These poor fit estimates were addressed in the next step of model testing.

Table 33: Initial Model Estimates

Endogenous Variable	Exogenous Variable	B	ß	SE	CR	Sig.*
Behavioural Intention	Social Norms	-0.59	-0.46	0.35	-1.66	0.10
Behavioural Intention	Attitudes	-0.24	-0.08	0.65	-0.37	0.71
Behavioural Intention	PBC-Self Efficacy	-0.12	-0.09	0.09	-1.39	0.16
Behavioural Intention	PBC-Control	0.84	0.51	0.68	1.24	0.22
Behavioural Intention	Role Legitimacy	1.14	0.76	0.77	1.49	0.14
interest_phone_app_ASBI_43	Behavioural Intention	1.00	0.66			
interest_train_ASBI_42	Behavioural Intention	0.82	0.71	0.06	13.91	**
use_smartphone_app_33	Behavioural Intention	0.82	0.63	0.07	12.55	**
ASBI_proced_ED_would_cond_38	Behavioural Intention	0.82	0.77	0.06	14.81	**
supp_concep_ASBI_ARI_39	Behavioural Intention	0.79	0.74	0.06	14.41	**
colleague_expect_SBI_28	Behavioural Intention	0.58	0.52	0.05	10.74	**
ED_ARI_expect_20	Social Norms	1.00	0.59			
R_unaware_screen_ED_31	Social Norms	0.80	0.41	0.11	7.58	**
R_most_not_think_respon_36	Social Norms	0.52	0.33	0.08	6.30	**
likely_conduct_ASBI_30d_41	Social Norms	1.49	0.79	0.14	10.83	**
ED_PracSetting_18	PBC-Control	1.27	0.57	0.13	9.94	**
decis_ASBI_entire_me_40	PBC-Control	0.18	0.09	0.10	1.82	0.07
screen_detects_future_23	PBC-Control	0.86	0.54	0.09	9.51	**
easy_perf_BI_27	PBC-Control	1.02	0.54	0.11	9.57	**
ASBI_proced_ED_would_cond_38	e4	0.85	0.64	0.03	25.45	**
R_ARI_poor_dec_26	Attitudes	0.70	0.22	0.18	3.90	**
R_no_time_ASBI_ED_35	Attitudes	1.89	0.55	0.27	6.89	**
pleas_SBI_ARI_24	Attitudes	1.95	0.64	0.27	7.19	**
R_ARI_bad_exper_29	Attitudes	1.52	0.44	0.24	6.22	**
R_ARI_time_comsum_19	Attitudes	1.00	0.41			
my_role_BI_25	Role Legitimacy	1.05	0.63	0.10	11.08	**
respon_ask_drink_beh_34	Role Legitimacy	1.00	0.60			
R_diff_id_alc_dep_32	PBC-Self Efficacy	1.00	0.61			ß
ID_haz_harm_drink_21	PBC-Self Efficacy	1.11	0.70	0.19	5.81	**
confid_screen_advise_37	PBC-Self Efficacy	0.60	0.35	0.11	5.66	**
BI_effect_ARI_22	PBC-Control	1.00	0.54			

*Signif at .05 level; p = ** value close to 0; SE-standard error; CR-critical ratio= z=B/SE; SE & CR not computed for reflector indicators (B = 1.00)

7.5 Model Testing

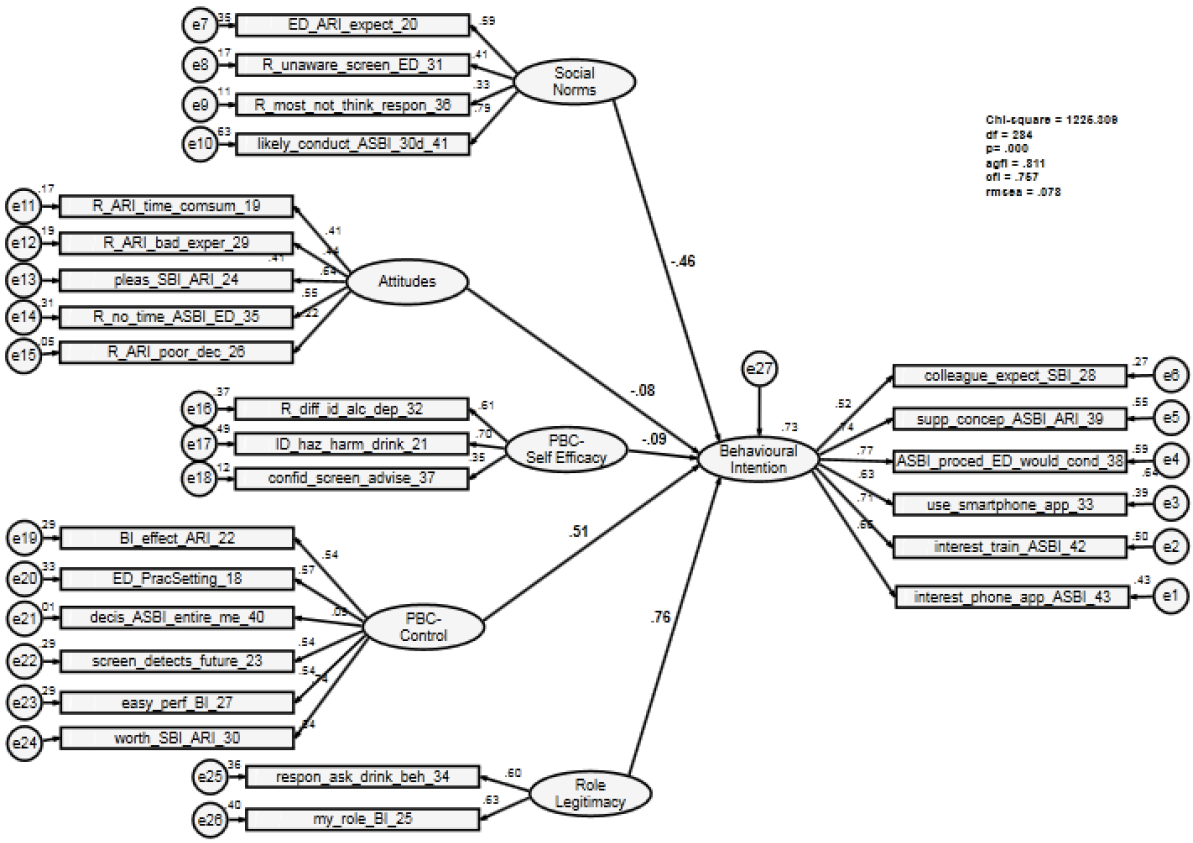
Once the model was specified, checked for identification, and parameter estimates were obtained, the model fit criteria were evaluated. A number of fit indices were assessed, both as global tests (model as a whole) and individual parameters tests (table 34). The results showed that the initial model had a very large χ^2 (χ^2 (284, n=543) = 1225.31, p<.001), in relation to subsequent modifications. Additional fit indices suggested the model had major discrepancies between the implied and observed matrices. For example, the root mean-square error of approximation (RMSEA) was initially assessed at .078, the Tucker-Lewis Index (TLI) was .722 and the Adjusted Goodness-of-Fit index (AGFI) was .811. These indices were

substantially out of range from the acceptable levels (standard thresholds: RMSEA < .05; TLI > .90; AGFI > .90), requiring considerable modification.

Critical ratios (C.R.) of the parameter estimates (standardised βs) along with the significance values were inspected (figure 12). Several independent latent variables were not significant. For example, the estimates of the regression weights for behavioural intention on social norms (β = -.46, C.R. = -1.67, p = .10), attitudes (β = -.08, C.R. = -.37, p = .71) and, PBC-self efficacy (β = -.09, C.R. = -1.39, p = .167) were not significantly different from zero at the 0.05 level (two-tailed). In addition, the direction (negative estimates) was inconsistent with and theoretical and conceptual propositions. While the estimates for PBC-Control (β = .51, C.R. = 1.03, p = .30) and role legitimacy (β = .76, C.R. = 1.49, p = .14) were also not significant, it was expected some of these variables would improve with modifications, based upon findings from chapter six.

As it were, many indices suggested the implied theoretical model was not very representative of the observed sample data and thus ill-fitted. That is, the original sample variance-covariance matrix was not reproduced because the observed variable relations were not totally accounted for by the theoretical model. All model-fit indices have standard acceptable levels as noted in section 7.6 (table 34-THRESHOLDS). Therefore, modifications aimed to improve the model fit to these thresholds. The next section explains the procedures used to detect and make adjustments to the specification errors, so that a more properly specified theoretical model may be evaluated.

Figure 12: Initial ED-ARI Model



7.6 Model Modification

While there was a substantial decrease in the χ^2 fit statistic with subsequent modifications, it remained significant (χ^2 (261, n=543) = 571.82, p<.01). This would suggest that the model was not well-fitted (χ^2 is highly sensitive to large samples (n > 200) and distributional properties of the data). In this step, the χ^2 statistic was used to test the alternative, rather than the null hypothesis. The objective was to obtain a non-significant result, and thus fail to reject the alternative hypothesis that; 'there not was a significant difference between the two matrices'. That is, χ^2 worked as a discrepancy function to test overall 'lack' of model fit. An extensive amount of modification and re-specification was therefore employed using this, and other discrepancy function tests; RMSEA, AGFI, and CFI. Recommended changes were implemented on multiple steps and each index was checked

repeatedly for improvement. After multiple reiterations and enhancements guided by these modification indices, a well-fitted model was produced with several indices meeting acceptable levels (table 34).

Table 34: Initial & Final Model fit indices & SEM acceptable levels

Model	NPAR	df	X^2	X^2 signif	GFI	AGFI	TLI	CFI	RMSEA	LO 90	PCLOSE
INITIAL	67	284	1225.31	0.00	0.847	0.811	0.722	0.757	0.078	0.07	0.00
FINAL	92	259	571.39	0.00	0.927	0.901	0.899	0.919	0.047	0.04	0.81
THRESHOLD	--	--	--	p > .05	> .90	> .90	> .90	> .90	< .05	= 0	> .05

NPAR = number of parameters; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; TLI = Tucker-Lewis index; CFI = comparative fit index; RMSEA = root mean-square error of approximation; LO 90 = ; PCLOSE =

Recalling from section 7.5 on model testing, there were critical ratios for parameter estimates that were found to be non-significant. After modification, the estimates of the regression weights for behavioural intention on three latent constructs: social norms; attitudes; and, PBC-self efficacy, were not significantly different from zero at the 0.05 level (two-tailed). Therefore, these regression relationships were removed from the structural model. Those relationships were replaced by covariances between the three variables and stronger predictor variables (viz, PBC-Control and role legitimacy). As a result, all other relationships were raised to levels of significance with acceptable critical ratio levels (table 35). This improved the weights between independent variables and factor loadings on their respective indicators. Modifications also involved constructing covariance relationships between indicator variables and their respective error terms. The full path model illustrating all relationships is located in Appendix C.

Table 35: Final model estimates

Endogenous Variable	Exogenous Variable	B	ß	SE	CR	Sig.*
Behavioural Intention	PBC-Control	4.04	0.64	1.98	2.05	0.04
Behavioural Intention	Role Legitimacy	0.26	0.21	0.09	2.77	0.01
interest_phone_app_ASBI_43	Behavioural Intention	1.00	0.55	0.08	12.84	**
interest_train_ASBI_42	Behavioural Intention	1.00	0.69			
use_smartphone_app_33	Behavioural Intention	0.92	0.57	0.08	11.82	**
ASBI_proced_ED_would_cond_38	Behavioural Intention	1.02	0.78	0.06	15.91	**
supp_concep_ASBI_ARI_39	Behavioural Intention	0.98	0.76	0.06	15.43	**
colleague_expect_SBI_28	Behavioural Intention	0.71	0.53	0.06	11.16	**
ED_ARI_expect_20	Social Norms	1.00	0.56			
R_unaware_screen_ED_31	Social Norms	0.82	0.40	0.11	7.48	**
R_most_not_think_respon_36	Social Norms	0.70	0.42	0.11	6.51	**
likely_conduct_ASBI_30d_41	Social Norms	1.54	0.79	0.16	9.71	**
ED_PracSetting_18	PBC-Control	6.04	0.57	2.85	2.12	0.03
decis_ASBI_entire_me_40	PBC-Control	1.00	0.10			
screen_detects_future_23	PBC-Control	4.26	0.56	2.01	2.12	0.03
easy_perf_BI_27	PBC-Control	3.99	0.46	1.89	2.10	0.04
ASBI_proced_ED_would_cond_38	e4	0.82	0.62	0.03	24.17	**
R_ARI_poor_dec_26	Attitudes	0.81	0.18	0.20	4.14	**
R_no_time_ASBI_ED_35	Attitudes	3.67	0.74	0.90	4.10	**
pleas_SBI_ARI_24	Attitudes	4.08	0.92	0.97	4.21	**
R_ARI_bad_exper_29	Attitudes	1.55	0.30	0.24	6.40	**
R_ARI_time_comsum_19	Attitudes	1.00	0.28			
my_role_BI_25	Role Legitimacy	1.06	0.65	0.10	10.92	**
respon_ask_drink_beh_34	Role Legitimacy	1.00	0.60			
R_diff_id_alc_dep_32	PBC-Self Efficacy	1.00	0.70			
ID_haz_harm_drink_21	PBC-Self Efficacy	0.83	0.62	0.16	5.07	**
confid_screen_advise_37	PBC-Self Efficacy	0.44	0.31	0.09	4.82	**
BI_effect_ARI_22	PBC-Control	5.04	0.57	2.38	2.12	0.03

*Signif at .05 level; p = ** value close to 0; SE-standard error; CR-critical ratio= z=B/SE; SE & CR not computed for reflector indicators (B = 1.00)

The final model, which accounted for 65.6% of the variance in behavioural intention, is presented in figure 13 (unstandardized) and figure 14 (standardised) estimates for regression weights and factor loadings. (The full path model is presented in Appendix C). The regression coefficients for PBC-Control (B = 4.04, C.R. = 2.05, $p < .05$) and role legitimacy (B = .26, C.R. = 2.77, $p < .05$) showed significant improvement from the initial model with critical ratios above the acceptable level (c.r. = $z > 1.96$). These B weights (blue lines) suggest for a single raw score change in PBC-Control, behavioural intention increased by 4.04 units. Likewise, for a unit change in role legitimacy, behavioural intention increased by .26 units.

The correlations (red lines) between independent variables identified a few strengths of association between latent exogenous variables. For example, social norms was strongly correlated with role legitimacy (r = .72, p < .01), but moderately related to PBC-Control (r = .47, p < .05). Role legitimacy and PBC-Control were strongly correlated (r = .76, p < .05), but the relationship between role legitimacy and PBC-Self efficacy while significant, was weak (r = .17, p < .01). The relative strengths of these weights are interpreted further in the discussion section 7.6.

Figure 13: Final ED-ARI Model-Standardised

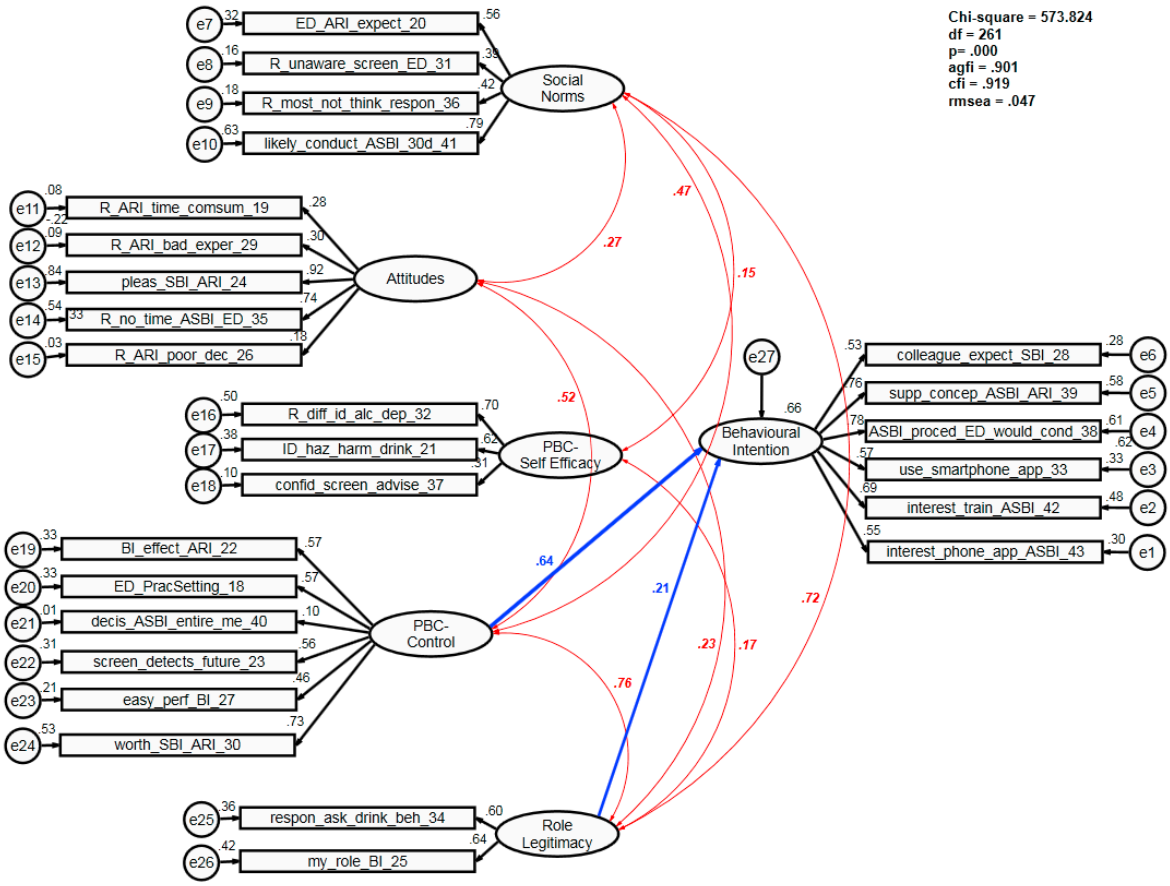
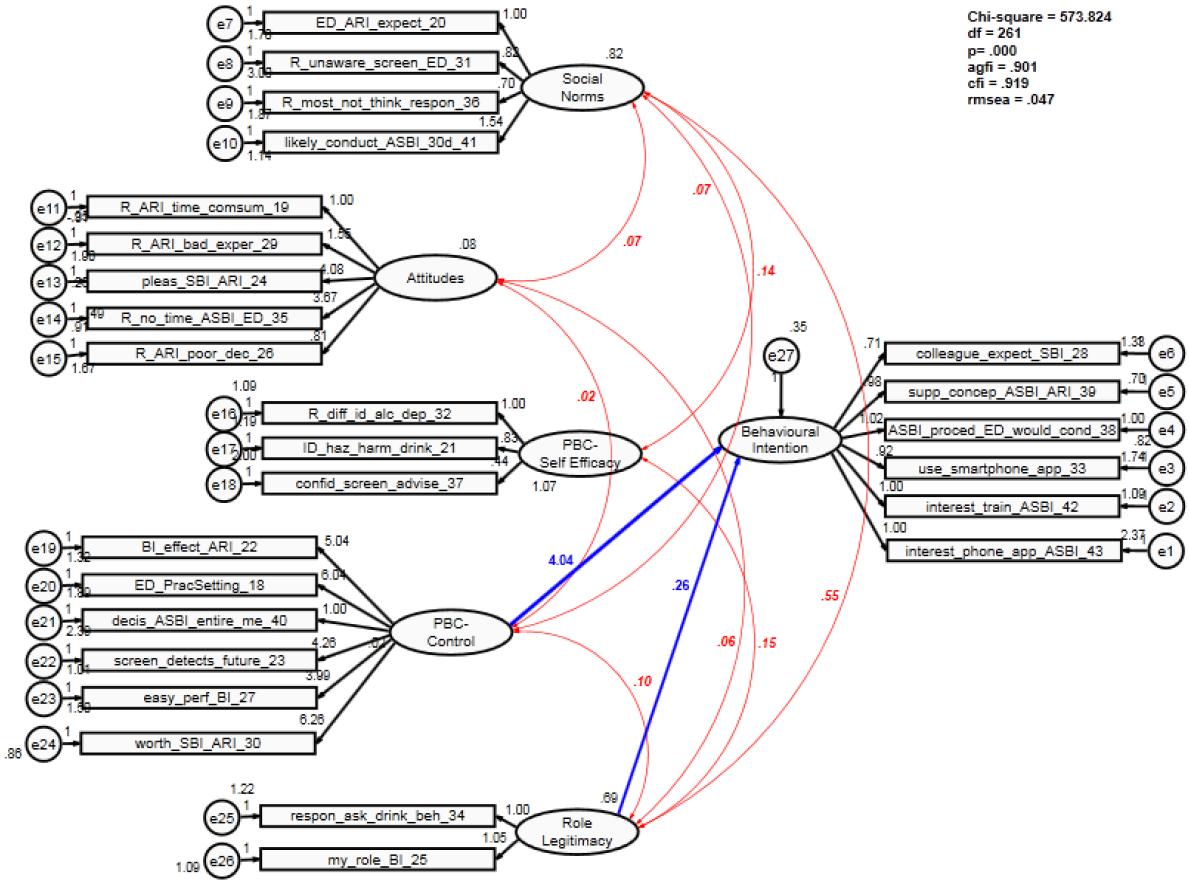


Figure 14: Final ED-ARI Model-Unstandardised



7.6 SEM Discussion

Structural equation modelling provided a methodological process for investigating the TPB constructs that underpinned ED-ARI survey measures, which were set to test hypotheses bearing on clinician behavioural intention. This approach examined a number of fit indices and tests for determining the most appropriate model to represent the data. The χ^2 value was one fit statistic used to minimise the discrepancy between the observed, and the implied variance-covariance matrices. That is, as a fit function to test the 'lack of fit', χ^2 was used to assess the difference between the empirical data and the implied/hypothesised model. While the χ^2 value reduced substantially over several modifications, it remained statistically significant (χ^2 (261, n=543) = 571.82, p<.01), which suggested a poor fit between the implied

theoretical model and the data. However, due to the sensitivity of χ^2 in large samples, other fit indices were also assessed. An examination of those indices demonstrated acceptable model fit with AGFI = .90, CFI = .92, RMSEA = .047, TLI = .899 (522, 525-527). Multiple discrepancy functions were used to assess: model fit; residuals; comparative fits; and, indices of model parsimony. As a result, there was enough evidence to accept the final model as a tenable representation of the data it purported to portray. That model was based on a conceptual framework that attempted to explain the variation in behavioural intention to provide screening and brief intervention for alcohol-related injury.

An inspection of parameter estimates suggested the total predictive value of the structural model in explaining variance in behavioural intention was 65.5%. That is, the model was unable to explain 35% of the variance in clinician behavioural intention, to provide ASBI for alcohol-related injuries. While attitudes, social norms and self-efficacy have been identified as important theoretical constructs in many studies, their effects in this sample appeared to operate in a more indirect manner. There were strong correlations between social norms and PBC-Control as well as social norms and role legitimacy. This may be interpreted as an indication that perceived expectations to intervene and provide brief advice for ARIs are mediated by one's sense of control over the action. Or it may mean that social norms indirectly influence behavioural intention through a perceived sense of control. In that regard, it may be necessary to promote a culture of positive expectations to enhance clinician autonomy around the decision to provide ASBI.

Likewise, a strong correlation was found between role legitimacy and social norms. This may imply that clinicians' belief about their responsibility to have a short discussion with patients on drinking behaviours and risk factors, is associated with the collegial culture within the emergency department. If there is a common awareness that 'this is our role', that perspective is likely to increase intentions to intervene. Thus awareness promotion strategies

that focus on the professional culture to normalise brief interventions, may be key to enhancing ASBI as routine practice.

The strength of intervening was increased four-fold by perceived behavioural control. This would indicate that above all else, belief that screening is effective for detecting future injury, as well as feeling the ED is a practical setting to address alcohol harms, has a significant impact on the willingness to respond from an evidence-based perspective. Therefore, training and education centred around enhancing clinician autonomy may be imperative. These findings suggest that it may be reasonable for ED-based ASBI training and education to focus on intervention efficacy, with a particular emphasis on the continuum of drinking patterns. By providing clarity on the distinctions between hazardous drinking and dependence, responses would be guided by the indicated intervention (i.e. brief advice or referral to treatment), thus enabling clinicians to experience greater ease and control in the task. In addition, increased familiarity with specific treatment indications for different points on the continuum is likely to cause clinicians to feel better equipped to intervene. Thus, adequate screening practices and routine training that imparts fidelity to evidence-based models, could increase the occasions of service that involve effective delivery of brief interventions. This in itself is likely to increase a sense of empowerment and control, adding further strength to the intention and willingness to respond.

CHAPTER 8. COMPREHENSIVE DISCUSSION

A critical analysis of the literature identified a substantial lack of routine evidence-based responses to alcohol-related injury (ARI) in Australian emergency departments. Furthermore, extant reviews emphasized the fact that there has been an inadequate exploration of this issue, as it relates to alcohol screening and brief interventions (ASBI) and clinician behaviour. The current investigation, guided by the Theory of Planned Behaviour (TPB), examined these issues with the aim of developing a conceptual framework composed of constructs that represented clinician behavioural intention to provide ASBI.

The study objectives included a set of hypotheses tests, based on a critical analysis of the literature, that identified factors that potentially contributed to variations in clinician responses, and how individual thoughts and beliefs may affect the sense of responsibility to respond. Individual thoughts and beliefs were explained through four main influences on intention as identified by a modified version of the TPB: attitudes; social norms; perceived behavioural control; and role, legitimacy.

This final chapter provides a four-part discussion. The first part summarises and offers interpretations of the hypothesis testing as it relates to the literature. Study findings are integrated within the underpinnings of the conceptual framework. The second section extends from there to revisit the SEM model, and how a comprehensive testing of the framework provided additional insights and perspectives about current responses. The third section considers the strengths and limitations of the study. A final section describes the implications and offers some recommendations resulting from this research.

8.1 Hypotheses summaries and interpretations

The support of competent and confident ED clinical staff is critical to effective screening and brief interventions for alcohol-related problems. The Theory of Planned Behaviour was a key reference point for examining how several factors might explain

response differences associated with that support, and the mechanisms that facilitate or impeded routine practice. An aim of this study was to understand what set of clinician characteristics are typical of "high intenders". As this aim was not associated with a specific demographic hypothesis, a summary of the sample characteristics is presented here and discussed in relation to the literature.

There were 543 completed surveys in the ED-ARI sample, which was primarily represented by female nurses (52%), followed by male doctors (19.9%) and female doctors (15.5%). The allied health representation was quite small (6.3% of the total). Within professions, 56.3% of the doctors were male, while 90.5% of the nurses were female. These proportions were similar to other national and international samples. For example, one Australian study collected survey data from a sample that was 56% male doctors and 80% female nurses (515). Similarly, one international study reported a sample of ED staff that was primarily female nurses (81.8%), while another Australian investigation reported an 86% female sample (nurses only) and, a U.S. study reported ED nursing staff as mostly women (82%) and doctors primarily male (79%) (243, 442, 528).

Sixty-five percent of the ED-ARI sample reported working less than 10 years in the ED, and just under 80% worked between 20-40 hours per week. On average, nurses had longer experience in an ED setting compared to doctors and allied health. Three-quarters of the clinicians worked at hospital less than 10km from a central business district where there was likely to be an increase in night-time entertainment activity. All Australian states and territories including New Zealand were represented in the sample and half of the hospitals were either major referral or urban district facilities. Within the week prior to taking the survey, over two-thirds of the respondents encountered a patient who presented to the ED with an alcohol-related injury. In spite of this encounter prevalence, a substantial majority of staff reported not having formal alcohol screening training (68%), nor formal brief

intervention (69%) training. Low levels of ASBI training were also reported in similar studies focusing on ED doctors' and nurses' knowledge and attitudes regarding substance use. For example, Kelleher & Cotter (2009) reported 78% of their sample did not have specific alcohol and/or drug training, and Indig et. al, (2009) noted that less than 10% of staff stated they had formal training (58, 442). In contrast to this, Freeman et. al, (2011) reported 69% of a South Australian sample of nurses had undergone alcohol-specific training or education (243). Another South Australian study during the same time period, with a sample of 47 nurses, reported none of its participants received specialist training in alcohol treatment (142). It has also been reported that less than half of ED staff were aware of alcohol intervention policies, nor was it typical for these policies to be strongly enforced (88, 243, 529). Approximately 63% of the ED-ARI sample were unaware of any alcohol brief intervention policies in their ED. Thus, it appears that the 'average' ED clinician is likely to be a female nurse with little formal ASBI training or policy awareness, working part-time in a hospital with a reasonably high prevalence of ARI presentations. While there is some variation within this demographic representation, it does imply the need for structured and perhaps tailored support of ED staff that underscores formal screening and brief intervention delivery.

In light of this general sample description, it was important to consider how clinician attitudes, normative beliefs, confidence, and sense of control within their work environment influenced decision-making and the response process. The hypotheses that attitudes and social norms were directly related to the strength of intention to intervene were supported by evidence that indicated, after accounting for demographic factors, attitude and social norms explained respectively, 4% and 3% of the variance in behavioural intention. While significant, these two factors were not as strong as reported elsewhere in the literature. For example, one Australian study found attitudes had a relatively strong influence on the rates of

asking about client alcohol consumption (243), and some reviews showed attitudes made a notable contribution towards management of intoxicated patients (193). In a TPB study of enrolled nursing students, attitudes and subjective norms had a significant positive effect on behavioural intention (530). However, Anderson et. al, (2004) found attitudes did not improve and actually worsened with training that albeit, increased screening and brief intervention delivery (160). This resonated with work by Cartwright (1980) which suggested that experience working with 'drinkers' in a specialised setting, conferred more positive attitudes towards these clients compared to working in a general health setting. This is partly because within such specialist agencies, there might be an increased likelihood for staff to enrol in alcohol training and education, as well as receive support and normative reinforcement from colleagues. In short, attitudes and normative beliefs may vary widely based upon experiential factors and require broader contextual considerations when drawing conclusions about the overall impact on intentions. Cartwright (485) observed: "The most important determinants of positive therapeutic attitudes towards the alcoholic client are to be found in the agent's experience and support, and that the effect of factors such as education and self-esteem is contingent upon these variables" (p. 427). As such, these initial findings concur that attitudes and social norms do influence the behavioural intention process, but are sensitive to previous experience, work-related contexts as well as education and training.

A finding of this thesis did demonstrate PBC-Control had a significant influence on behavioural intention. The evidence supporting the hypothesis included strong factor loadings on the PBC-Control component, and a unique explained variance of 27%. This was consistent with several studies that also showed perceived control was associated with healthcare professionals' intentions to use evidence-based guidelines in their decisions on patient care (386, 419, 518). Relatedly, it appears that many training efforts have successfully enhanced screening and intervention rates, by targeting perceptions of control and autonomy around

decision-making (258, 531, 532). The results revealed that in the process of intending to intervene, clinicians place substantial weight upon the idea of having control in the affair, as well as ease in performing the task. Two cognitive probes in the questionnaire that loaded high on the control component, specifically queried a sense of control over the outcome of one's efforts. Thus, in addition to belief in SBI efficacy, and feeling autonomy in the decision-making process, it was important for clinicians to have a sense of influence over the outcome of intervening.

The hypothesis that a sense of role legitimacy to intervene in ARIs is associated with SBI uptake was also supported by the findings of this research. The results showed that after controlling for demographic characteristics, role legitimacy contributed an additional 21% of the explained variance in behavioural intention. There was a significant mean difference on this component between professions. For example, allied health had a 4.08 higher mean than nurses, while the difference between the latter and doctors was l.16. There were also significant differences based upon years of ED experience, whereby more senior clinicians (15.1 years of experience) were incrementally less likely to report a sense of role legitimacy to intervene, compared to junior clinicians. That is, the biggest gap in mean differences was between the most senior and most junior staff, which gradually decreased with each year group, while remaining significant. It has been demonstrated elsewhere that clinicians who believed intervening in ARI was a part of their role, were more likely to respond or have intentions to do so (161). However, an increased sense of role legitimacy and improved competence does not necessarily lead to sustained perceptions about ASBI efficacy and appropriateness in the ED (59). That conclusion may be linked, however, to other factors as indicated by the current findings. For example, nurses on average had more experience in the ED, but those clinicians who had worked longer appeared to have less of a sense of legitimacy compared to more junior staff. While the data do not directly indicate such, it may

be that more recent investments in public health promotion efforts to address alcohol harms may be related to the observed increased optimism in junior staff. Those efforts may in some way moderate the attitude-role legitimacy relationship and reinforces a positive disposition about one's role in a public health context. This is something that may be directly examined in future research. It appears that ED staff who demonstrate higher behavioural intention, may do so on the basis of having a stronger sense of role legitimacy to intervene in ARIs.

There has been some contention in the TPB research regarding the concept of self-efficacy as a construct within the PBC component (419, 421, 422, 424). The current findings provided preliminary support for self-efficacy to be analysed as a separate component that influenced behavioural intention. However, the apparent influence was quite small (1% additional explained variance), which suggests methodologically that the position of the original TPB developers was valid. From a clinical perspective, the explanatory power of self-efficacy in this sample does not provide additional insight into the factors hypothesised in the response process. This does not necessarily imply a lack of relevance for self-efficacy as an influential mechanism of clinical practice. It may be that keeping both control and self-efficacy consolidated as one PBC component will provide results that have more tangible insights to how PBC operates on behavioural intention. Thus, future analyses of this type should assess PBC as recommended by Ajzen (2002) and others, while considering the potential for there to be unique efficacy and controllability factors that correspond to external and internal factors within the same latent variable.

The sixth hypothesis focused on the effect of perceived barriers on behavioural intention. There has been substantial notation on the topic of barriers and facilitators to interventions in the ED, with many studies reporting time and limited resources as chief concerns. Previous qualitative work, in addition to the findings of the qualitative component of this research, supported the view that most staff readily identified a number of workplace

barriers to SBI implementation. Thus, a test of the hypothesis was conducted to demonstrate whether a proportion of the variance can be accounted for by heavy workload and limited resources. The results did not support this hypothesis, which may be due to methodological as well as conceptual reasons. For example, the variable perceived barriers was formed from indicator variables that loaded on two core TPB components. Thus, this composite did not have any unique indicators that were conceptually distinct from the other composites. In its current form, the barriers implied by the construct may not have accurately accounted for true barriers observed in the population. Finally, the correlation of with behavioural intention was weak and not significant (β = .07, t=1.31, p= .19), which precluded further analyses. Future research should use a more robust methodology for developing and testing this construct in the population, based upon the strong implications for perceived barriers to impact successful ASBI implementation.

The final hypothesis on the combined interaction effects of the conceptual framework was tested and supported. In an examination of the evidence, it was demonstrated that the largest amount of explained variance was accounted for by the multiplicative effects of all independent variables. Sequential regression analyses identified an incremental R^2 change, resulting in a more parsimonious model, that accounted for 43% of the variance in behavioural intention (adjusted R^2 = .41). That parsimony reflected the reduced explanatory potential of social norms, attitudes and self-efficacy in a model that considered multiple effects simultaneously. Thus, separately, each construct appeared to provide small explanations for the observed differences in the sample behavioural intention. However, the significance of the constructs' individual effects diminishes in a broader context. This indicates that in general, clinicians may not uniformly prioritise concerns in an intervention strategy for ARI. That is, for a senior clinician, years of practical experience managing ARIs (both in terms of the aggressive behaviours, and perceived poor treatment outcomes where

the same patients re-present for ARIs) moderates attitudinal optimism and lowers treatment confidence. In that case, the behavioural intention and subsequent response may be better explained by attitude and self-efficacy. A junior clinician with less exposure to such clinical patterns, who has received formal ASBI training and role support within their department, may endorse a stronger sense of competence and greater willingness to intervene. In that case, perceived behavioural control and role legitimacy influence the intervention strategy. In summary, these findings suggest that a more accurate portrayal of the response process to alcohol-related injury requires a comprehensive conceptualisation of behavioural intention. Such conceptualisations emphasise the synergistic and complex processes that drive cognitive decision-making, and the characteristics that weigh on the average ED clinician's intention to intervene. Multivariate analyses have been commonly used to identify and understand these processes, but the next section summarises the steps taken to enhance these analyses with a more sophisticated approach using SEM.

8.2 Structural equation modelling summary and interpretation

Chapter seven presented the SEM steps taken to deconstruct multiple components within the conceptual framework and identify the unique sources of variance across the model. The five steps involved model: specification; identification; estimation; testing; and, modification. In that process, several conventional regression analysis problems were overcome. For example, the composite variables developed to represent the model constructs were allowed to load differentially on each indicator (survey item), which permitted unequal weightings for the multiple indicators of each latent variable. Furthermore, unlike conventional factor analysis, which assumes error terms are uncorrelated, SEM permitted error term correlation, and allowed parceling out of unique measurement error associated with measurement of each observed variable. In this manner, it was possible to obtain greater accuracy of the parameter estimates associated with each exogenous (independent) variable

compared to conventional analyses. As a result, the final model was able to explain 65.5% of the total variance in behavioural intention to provide ASBI for ARI, which was a substantial improvement over the 43% explained variance found by conventional regression described in chapter six.

At the model estimation step, it was clear that the baseline theoretical structure was a less than ideal representation of the empirical data collected from the survey. Thus, several modifications were implemented over a series of analyses until an acceptable level of model fit was achieved. That revised model showed only two of the original latent variables, PBC-Control and role legitimacy, to be significantly related to behavioural intention. Control demonstrated a direct effect on behavioural intention such that the strength of intervening improved four-fold by a clinician's increased sense of autonomy. Behavioural intention was also enhanced by a factor of .26 when the clinicians sense of role legitimacy is strengthened. Thus, the collective response to ARI in the ED may be improved with enhancements in role support and direct control of implementation practices at the clinician level.

The results of this study vary slightly from those found in similar TPB-SEM analyses by Talbot et. al, (2015) and Freeman et. al, (2011). For example, Talbot used an eight item, semantic differential as a composite for attitudes and found a direct effect for both attitudes and social norms, and an indirect effect for self-efficacy and controllability on intention (530). Their study did not include a predictor variable for role legitimacy. Freeman also found attitudes and social norms to have a higher contribution over control and role legitimacy, but their findings suggested the TPB did not predict rates of actual behaviour (243). Both studies reported small samples of nurses (Talbot, n=86 and Freeman, n=71), and some shortfalls in obtaining suitable power to interpret small coefficients. Notwithstanding, those results resonated with the current proposition that there was ample evidence to examine ASBI practices on the basis of specific antecedents to behavioural intention.

Social norms, PBC-self efficacy, and attitudes appeared to have indirect effects through covariance relationships with the significant latent variables. For example, the correlations between social norms and role legitimacy (r= .73) or social norms and PBC-Control (r=.48), suggest normative beliefs influence clinician perceptions about their responsibility and the control they exert. It is likely that normative beliefs reinforce perceived control via collegial support to those clinicians who have implemented brief advice in the past, or have been identified by their peers as having additional knowledge about screening. Thus, the expectations staff perceive from their colleagues may increase a sense of responsibility and legitimacy to act in that role. Once a level of perceived legitimacy is reached, this may trigger a higher intention to take up the practice, or at least strongly consider an intervention.

Six factors loaded on PBC-Control at varying weights, but the ones loading highest were items such as: belief that the ED was a practical setting to address individual patterns of harmful alcohol consumption (*fx load* = 6.04); BIs are effective for managing alcohol-related injury (*fx load* = 5.04); and, screening detects risk of future injury (*fx load* = 4.26). This implied that clinicians strongly valued the utility of ASBI as a measure of control, which could have intention-raising effects if strategically incorporated within training. For example, clinicians could be offered a set of didactics with actor simulated training sessions that focus on the use of screening techniques and subsequent delivery of brief advice. Staff could also be offered educational programs that review the evidence of efficacy, highlighting implementation fidelity and how this should be distinguished from informal BI practices. An additional lesson might be gleaned from follow up evaluations with patients who have received interventions from local staff. That follow up data could be examined with the staff in an educational context to explore lessons learned and areas for improved practice. These examples would be contextualised in a manner consistent with staff expectations of perceived behavioural control.

Taken together, it appears there were a number of points from which clinician behavioural intention could be increased. The strong relationship between perceived behavioural control and role legitimacy (r = .76) indicates targeted strategies across these two constructs may result in marked improvement in the uptake of ASBI as evidence-based practice. A secondary reinforcement would be to improve attitudes, self-efficacy and social norms in a more tailored fashion that targets specific groups of clinicians, such as senior staff, nurses, or trainees who have minimal exposure to ARIs, and negligible experience with intoxicated patients. As such, these findings could be applied to the development a training curriculum that is cost effective due to the discrete end-points of a targeted delivery. The findings could also be used to inform ED alcohol policies that drive guidance protocols for brief interventions. Those protocols would specify when and how the brief intervention is delivered and by whom. Such policies would also direct the implementation of routine screening, with rapid adoption in areas of highest need, such as those hospitals nearest the CBD. This could be supplemented by a diffusion of innovation model, whereby the early adopters and early majority are identified by evidence of strong behavioural intention based upon control and role legitimacy indicators of a brief survey.

8.3 Study strengths and limitations

This study proposed a set of hypotheses to explain the variance in behavioural intention that arises from a number of antecedents, and that the relationships were unique in each case. That is, taken in isolation, each construct appears to have a significant impact on the intention to intervene. A strength of this study was to propose, an 'a priori' theoretical framework to examine the phenomenon from a contextual perspective that accounts for multiple constructs simultaneously. Thus, when all composite variables were collectively introduced into the model (seventh hypothesis), three composites no longer had direct effects at the level previously assumed. Contrary to what has been observed in related studies, attitudes or social

norms do not work in isolation, but are part of a larger synergistic effect on behavioural intention. For example, D'Onofrio et. al, (2002) found attitudes did not change over time with training (123). This may be explained by the thesis findings, which showed attitudes were not a strong predictor in a structural model. It is more likely that socially-normed and positive attitudes enhance self-efficacy, which is associated with a sense of role-legitimacy. A stronger sense of role legitimacy supports greater perceived control, which results in higher behavioural intention and thus, a likely increase in the implementation of ASBI.

Based on univariate analyses, nurses tended to have less optimistic attitudes compared to doctors and allied health. The current SEM analyses did not enter control groups which may have uncovered additional information about group differences-another tailored training consideration This points to the need for more complex and sophisticated techniques beyond those used here, to further disentangle the unaccounted co-variance that may exist between constructs and control variables. In that manner, it would have been possible to more accurately account for shared variance between constructs that, has otherwise been included in residual sums of squares.

Allied health as a group, tended to exhibit higher optimism on average, relative to the other two professions. While there was a small representation of this class of ED clinicians, it was unclear if the high optimism was a true trait of the population or an indication of sampling bias and/or response bias. Future studies could address this shortcoming by purposive over-sampling of allied health ED staff to determine if the characteristics observed in this study are representative of the general population. The implicit advantage would be access to a highly receptive group of ASBI trainees.

It appears that the sample as a whole was not highly affected by the properties of self-efficacy, as measured in this study. To extend, it may be that self-efficacy (as an attribute) is either not high, that self-efficacy (as a construct) is not as influential, or that self-efficacy (as

a factor) is not a direct criterion, for making a behavioural intention. Although it was an objective of this thesis, to delineate these aspects of self-efficacy as a contributor to behavioural intention, it was not straightforward how much of the attribute, vs. the construct, vs. the factor, was acting in the measured variable. This was a specification issue that required more validity testing during construct development to increase accuracy of the measurement. ED clinicians most interested in the topic of the survey may have been more likely to respond, which increased the possibility of response bias. In this regard, there may be an overestimation of the true proportion of Australian ED staff who support ASBI for ARI.

A possible study limitation is the use of imprecise language and terminology applied in the survey item development. For example, while a definition of "brief intervention" was provided, it may have still been conceptualised differently by various respondents. Furthermore, there was no distinct definition for "alcohol-related injury" offered in the survey text, which may result in low validity for items using that term. Future surveys should include an explicit definition of injury, which relies on universally applied taxonomy such as the ICD-10 codes for injury, and specify chronic and acute conditions that are alcohol-related. As noted in section 6.1, a review of survey instruments was conducted to identify the most relevant questionnaire items targeting health clinicians. Many of these surveys were dated and not well validated. It was also noted that there were no pre-existing standardised instruments designed for the specific population of interest (Australian ED clinicians working with ARI). The development of the current instrument followed TPB guidance from Francis et. al (2004), using factors elicited from focus groups (Chapter 5), to utilise expressions germane to Australian ED culture. While more precise terms exist in the research pedagogy, cultural colloquialisms that are imprecise often persist. Thus, some focus group language was retained in this context in order to capture affective tones and attitude strengths via the

language commonly used in the ED setting. This shortcoming may have compromised the ability to validly and reliably measure the effects of attitudes on behavioural intention due to vague or ambiguous interpretations made by some survey respondents. In short, an implicit study aim was to survey the population in a language that was familiar. While not intending to perpetuate stigma and the use of pejorative language, this effect in and of itself may have distorted participant perceptions and subsequent responses. Nonetheless, there was a deliberate attempt to capture the 'effects of language' in perpetuating stigma laden attitudes and beliefs, which in turn impact behavioural intention.

It is difficult to analyse any behavioural problem within the full context of which it exists. For example, there are many organisational, economic, and structural drivers of ED staff behaviour that have varied influences on the processes indicative of an ED response to ARI. However, analysis of all these processes was not explicitly accounted for in this study. While the present focus was more of a field exploration on how clinicians see themselves within their roles, what managers prioritise on the front lines would have a significant impact on clinician behaviour. This was accounted for in the social norms construct of the model, which considered important others' expectation of providing SBI and its effect on behavioural intention. Implicit within the social norms construct, was a referent to managers who have indirect influence on front line staff behaviours and decision-making processes. Although some front-line staff may be remotely cognisant of the economic drivers associated with ED fee and reimbursement structures, if hospitals are funded for alcohol interventions, this is likely to increase managerial support for ASBI, which in turn enhances the expectation of implementation. For example, Cooke (2000), demonstrated that perceptions of managerial priorities are a key influence on staff behaviour. Given the fact managers, department directors and hospital executives are more likely to be substantially influenced by funding models, future studies should consider interviewing the relevant policy makers and

stakeholders in terms of their perceptions about ASBI efficacy and related economic outcomes research.

It was not possible to obtain non-responder data, and thus speculate on demographic differences as well as attitudes and beliefs associate with non-responses. An additional limitation is the lack of a precise definition of "brief intervention". This possibly resulted in varied interpretations of the concept by respondents, thus limiting construct validity. However, it was anticipated that the multiple descriptions of BI displayed at the onset of the survey, with a text prompt in subsequent appearances may have facilitated a consistent interpretation amongst respondents based upon the use of cognitive probes in survey research (501, 507).

Generalisability was limited due primarily to the survey distribution channels, which included national peak organisations with ED constituent membership. Doctors were mostly drawn from their relevant professional organisation (ACEM) while most nurses were not associated with their respective group (CENA). Allied health likewise were less likely to be associated with a peak organisation. Thus, these findings cannot be generalised to all ED clinicians.

The effect of role legitimacy on behavioural intention involved showing interest in training and conducting SBI, as well as espousing support for interventions with ARIs. Thus, a belief that one has the obligation and the right to address alcohol-related injuries, appears to have a substantial influence on the adoption of screening practice, and subsequent intervention implementation. However, as with other analyses, this test of the hypothesis did not employ a directional measure, which reduced the ability to determine if a lower sense of role legitimacy was correlated with poor uptake of SBI practices, or if poor uptake leads to reduced role legitimacy. This is a particularly important mechanism to understand, in terms of the adoption of new methods and practices by ED clinicians. It may be that a certain

threshold of role-specific support, is necessary (but not entirely sufficient) to enhance motivation to work with ARIs, in addition to increasing professional self-efficacy. Therefore, future analyses should employ directionality measures, to better understand how varying levels of role legitimacy, will affect intention and subsequent practice.

8.4 Implications and recommendations

Some have argued that, over the last 50 years, not much change has occurred in terms of responses to alcohol-related harm in health care settings. Clinical perceptions about the intoxicated person as a disruption to the ED setting have been documented for some time. Mannon provided the following quote from a nurse in 1976:

> *"They (alcoholics) should be going to an outpatient clinic. They usually do not need medical attention. Drunks are a problem because they tie up a nurse's time. We have to keep an eye on them constantly. If they hurt themselves in the emergency room, it looks bad. People in the waiting room wonder what is going on. If they see a patient being restrained by nurses, they might not realize that the patient is drunk." (p. 1009)*

This quote is similar to that given by clinicians from the focus groups in this study:

> *"If I hear someone's coming and they go, 'oh they're under the influence of alcohol', I immediately just let out a sigh, 'cause [sic] you know it's gonna [sic] be, not every time, but as a rule, it's gonna be challenging to do anything".*
>
> *"Given time constraints in the ED, it's hard to set aside some time to do that counselling…it's much easier to say if you think it needs to be done, call up drug and alcohol and just leave it to someone else to do".*

Although popular opinions may resonate with the past, these finding have a breadth and depth of implications at both the practice and policy level that pervades 40 years of research advances. In terms of practice, key factors were identified that may be amendable to interventions such as building staff skills and confidence as well as providing additional support in role legitimacy. However, these improvements in skills may lead to an increase in intentions without necessarily resulting in changes to actual work practices. Efforts to increase the full continuum of implementation may also require strategies for translating

increased intention into direct practice. In addition to belief in SBI efficacy, and feeling autonomy in the decision-making process, it may be important for clinicians to have a clear sense of influence over the outcomes of intervening. That would necessitate balancing the sense of influence with practical expectations of the outcomes. Behaviour change is not as straightforward as stopping blood loss or suturing wounds. No doubt these issues can all present with a single ARI. However, a clear distinction is required between the physical and the psychological aspects of each. This does not suggest that nurses and medical staff must become proficient in psychological or behavioural health approaches. But it does imply that they need to be aware of the subtle distinctions that require specific approaches to intervening. It suggests a broader definition of hazardous alcohol use that is amenable to opportunistic strategies; those which are less associated with traditional alcohol treatment or prevention efforts. That is, an important teaching strategy would be to impart practical expectations about the effects of brief interventions, which do not have the same immediate outcomes as tourniquets or morphine. Also, while the dose-response effects of ASBI are not as clear, there is a degree of efficacy commensurate with fidelity of implementation and routine practice and there is evidence about inclusion and exclusion criteria (e.g. dependent patients may require referral to more intense treatment). Thus, from a public health perspective, it would be practical to incorporate staff perspectives and opinions as teachable moments in the process of developing an informed response.

With regards to policy implications, it will be critical to re-evaluate directives not only for future implementation research, but also how ASBI programs might be evaluated. For example, future studies should seek to interview ED managers, hospital executives, and role allocation staff in order to explore leadership influences on the implementation of ASBI training and education. Relatedly, more study is needed to examine organisational and alcohol policy factors that impact department responsibilities to meet clinical KPIs and other

intervention targets. This can begin with EDs, but as previously noted, some local trauma centres have recently adopted mandatory screening as per directives for implementing evidence-based practices (71). In addition, it may be worthwhile to explore state-level differences in ED policies. Such explorations may reveal complex tensions between acute care and health promotion in ED departments, and the various ways health services have attempted to re-route recidivism. The advantage of such would be to build upon translational research that focuses on what works and the potential for model adaptation across states.

There have been numerous studies to develop ED staff training models, which focus on building skills and confidence to provide SBIs. The outcomes of such studies sometimes resulted in little or no effect, or practice changes that were not maintained over time. It is likely that modifications in the training model, to include a component that modifies attitudes, by moderating staff sense of role legitimacy and commitment, would enhance implementation outcomes. Therefore, policies that govern clinical models for trainees, may require more enhancements around control beliefs and social norms, whereas models for more senior clinicians, may focus on moderating attitudes and beliefs developed from negative past experiences involving ARIs. This requires government level policies that mandate, and adequately facilitate implementation science and translation of research into practice.

These findings also suggest there may be unique "Australian" socio-cultural influences that limit generalisability from international studies. For example, overseas ASBI training and evaluation programs may require some modification prior to adapting to local structures, processes and cultural factors. Current policy efforts may require a broader embrace of the public health role inherent in emergency medicine that sets a precedent for national routine implementation of ASBI. As such, this study focused on Australian influences, which limited the ability to draw conclusions on an international level. To do so would require a model

that compares the impact of local conditions as well as state and national governments expectations. For example, the different reimbursement mechanisms of health services overseas (private vs public insurance schemes, NIH training grants, etc.) likely have a significant impact on ASBI implementation as well as research and education, which limits generalisability to the Australian model. These comparisons would be important in future investigations to improve the understanding of organisational influences and whether such local conditions operate similarly elsewhere in the world.

Training and education needs to be validated, and validating: validated in the sense that ASBI tools and techniques are standardised and implemented with fidelity; validating in the sense that clinicians are afforded the opportunity to receive endorsements in their efforts to intervene. This would require various degrees of social and normative support that legitimises the ED clinician's role as a public health professional and his/her ability to provide short term crisis interventions with potentially long term implications and to be aware of the personal, workplace and patient benefits of such interventions. Alcohol-related injury and behaviour change should not be perceived solely as psychosocial science, but a public health measure that can be applied/implemented, or taken up by any qualified person seeking to reduce avoidable harms and enhance quality of life for the people they serve.

APPENDIX A-Proposed Hypotheses-Extended List

1a. Clinician attitude/belief towards people who sustain an alcohol-related injury, will be directly related to the strength of the intent to intervene

1b. Clinicians with a neutral attitude towards alcohol-related injury will have greater variance in their intention to intervene, which can be accounted for by workplace cues to action (department policy; management expectations to intervene etc.) compared to clinicians who have positive or negative attitudes

1c. Clinician attitude and beliefs towards people with an alcohol-related injury will be related to their history of performing such interventions (that is for example, those who have negative attitudes will be less likely to have implemented and persevered with SBI in the past)

2a. Clinicians who perceive supervisor/peers approve (social norms) of performing SBI in response to alcohol-related injury are more likely to have the intention to implement this practice

2b. Clinicians who perceive their supervisors expect them to perform SBI for alcohol-related injury, are more likely to endorse statements supporting SBI

2c. Clinicians who perceive their supervisors expect them to perform SBI for alcohol-related injury, are more likely to have intended to implement a brief intervention in the last 12 months

3. Clinicians who believe performing SBI will not reduce readmission rates to the ED are less likely to intend to intervene with alcohol related injury

4a. A lower sense of role legitimacy as an ED professional to intervene in alcohol-related injury is associated with poor uptake of SBI practice

4b. An increased sense of role legitimacy/responsibility to intervene and willingness to take control of this practice, are mediated by belief in the 'efficacy of SBI'

5. A decrease in perceived behavioural control to perform SBI will have a negative moderating effect on the intention to intervene

6. A proportion of the observed variance in behavioural intention to perform SBI can be accounted for by perceived barriers in the form of heavy workload and limited resources in the ED

7. The combined interactive effects of attitudes, social norms, perceived behavioural control and role legitimacy account for a significant proportion of the explained variance in behavioural intention to perform SBI for alcohol-related injury amongst ED staff

APPENDIX B-Focus Group Questionnaire Guide

(Core questions bolded; Prompts dashed indents)

Q1. Please share what connection you see between injury or trauma presentations, and alcohol consumption?

- How do you think alcohol might relate/contribute to injury-related admissions?
- i.e. how significant/insignificant do you see the role alcohol might have
- i.e. the amount and nature of injury-related admissions

Q2. How responsible do you think people are for their injury when it occurs under the influence of alcohol?

- i.e. consider the case of someone who is intoxicated and injures themselves. In what way might this be different to someone who is injured as a result of another person's intoxication?

Q3. Do you think people who are injured as a result of their own drinking warrant medical attention?

Q4. What are your thoughts about responding/intervening with people in terms of their drinking behaviours?

- Some options might be: ignore drinking, tell them to cut it out, screen/ask about drinking, provide simple advice, refer to specialist organisation

Q5. Are there any people or groups in your professional network most likely to support you responding/intervening?

- i.e. screen/provide simple advice for drinking behaviours
- i.e. do managers/supervisors/colleagues have an expectation for you to intervene/respond to injury-related drinking behaviour?

Q6. How Q6. How are alcohol-related injuries typically responded to in the ED?

- i.e. what/is there a routine protocol?

Q7. Do you think people whose injury is affected by alcohol consumption are easier or harder to manage?

Q8. What thoughts do you have about your role/responsibility to intervene/respond?

- i.e. whose role should it be to screen and/or provide simple advice?
- i.e. who is best positioned to screen and/or provide simple advice in the ED?

Q9. What factors or circumstances in the ED would enable you to respond/intervene with people whose injury might be influenced by their alcohol use?

- i.e. what things in the ED would make it difficult or even impossible for you to respond/intervene with people whose injury might result from their alcohol use?

Q10. How important is it for you to comply with supervisor expectations to respond/intervene?

Q11. Under what circumstances is it appropriate/inappropriate to screen for 'at-risk' drinking behaviour in ED patients?

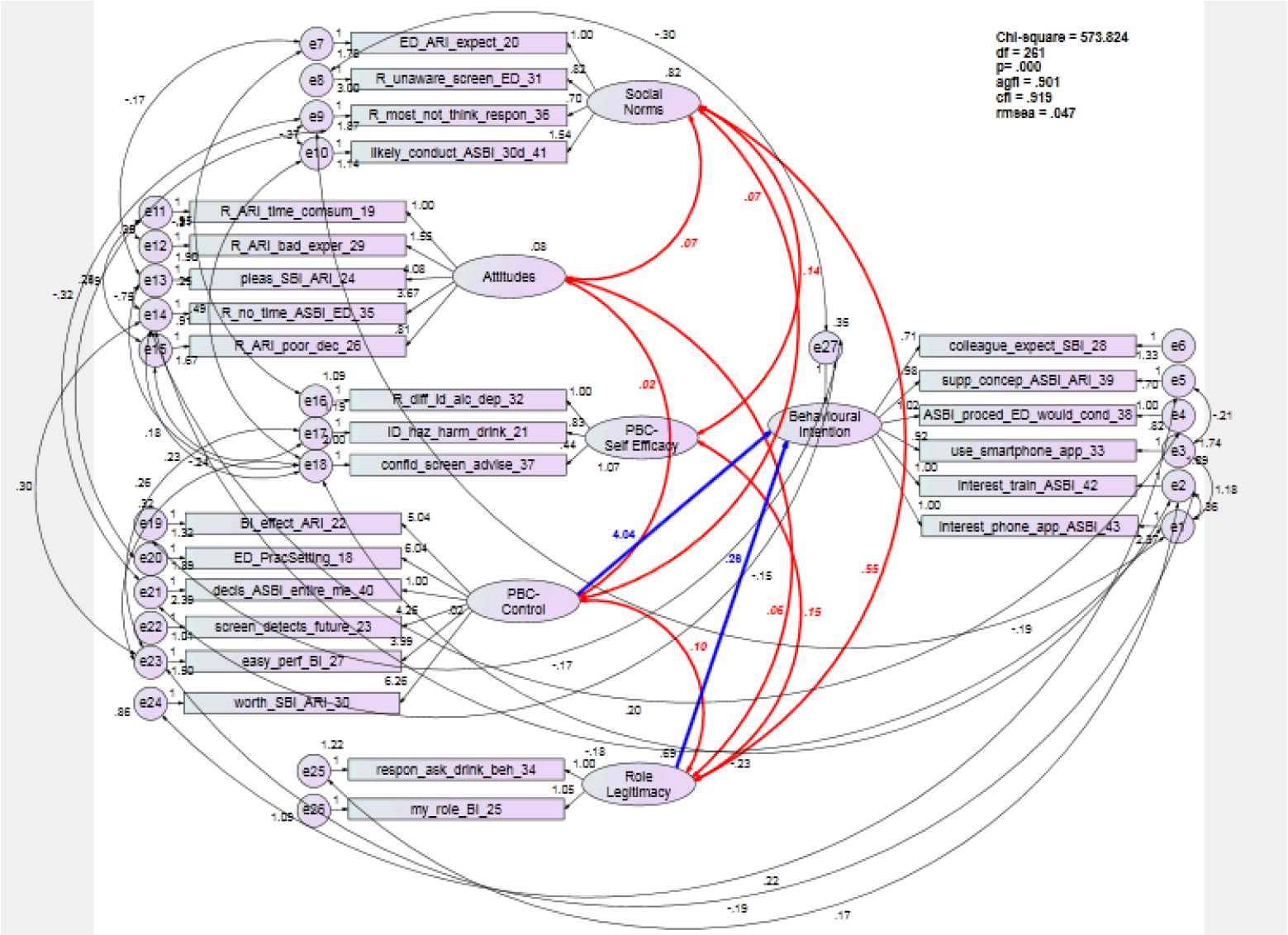
Q12. Is there ever an appropriate/inappropriate time to provide simple advice in alcohol-related injury?

- i.e. by directing attention to 'at-risk' drinking behaviour

Q13. What do you know about Screening and Brief Interventions (SBI)?

- Would it be worthwhile to use?
- Whose approval would be important before you were able to use SBI?
- How easy is it to screen for alcohol use?
- How easy would it be to provide a brief intervention to patients whose injury is alcohol-related?

APPENDIX C -Final SEM Model- Unstandardised Version



APPENDIX D –Organisational Approval Letter-ACEM

AUSTRALASIAN COLLEGE FOR EMERGENCY MEDICINE

34 Jeffcott Street, West Melbourne Victoria 3003, Australia | Tel 61 3 9320 0444 | Web www.acem.org.au
ABN 76 009 090 715 | Fax 61 3 9320 0400 | Email admin@acem.org.au

2 September 2014

Mr Rashid Flewellen
PhD Candidate, Principal Investigator
National Drug Research Institute
Curtin University

Via email: wflewell@umich.edu

Dear Mr Flewellen,

Re: Request for distribution of research survey titled *'Behavioural Intention to Provide Screening and BRIEF Intervention for Alcohol-Related Injury in the Emergency Department (ED)'*

Thank you for providing details about your research project. The Scientific Committee has reviewed the documentation and considered your requests for the Australasian College for Emergency Medicine (ACEM) to distribute a survey to members.

The Scientific Committee advises that ACEM will only permit the survey to be distributed to members via the standard method of the weekly emailed bulletin.

This should not be interpreted as ACEM endorsement for the project and as such the project should not be directly or indirectly associated with ACEM.

Should you proceed with distributing the survey to ACEM members, please also note that if any respondent feels distressed or upset at the questioning, the Scientific Committee requests that this be noted as an adverse event related to the project and report it to the ethics committee.

The Scientific Committee would also appreciate being informed of the survey response rate and be provided with a brief report about the project within twelve months of conducting the survey to ensure the value of this service.

Please notify Zoë Sum (zoe.sum@acem.org.au) at the ACEM office if you wish to proceed with the distribution of the project survey.

Yours sincerely,

Dr Yusuf Nagree
Chair, Scientific Committee

APPENDIX E –Organisational Approval Letters-CENA

ACN 102 951 799
PO Box 193
SURREY HILLS VIC 3127
Tel: 03 9895 4433
Fax: 03 9898 0249
Email: national@cena.org.au
Website: www.cena.org.au

Rashid Flewellen
PhD Candidate, Principal Investigator
National Drug Research Institute
Curtin University
rashid.flewellen@student.curtin.edu.au

Tuesday 3rd February 2015

Dear Rashid,

On behalf of the Board of Directors and the Research Committee of the College of Emergency Nursing Australasia (CENA) I wish to advise you of our support to access the CENA membership for your study entitled; ***Behavioural Intention to Provide Screening and Brief Intervention for Alcohol-Related Injury in the Emergency Department (ED).***

In view of this support, CENA gives formal permission to place an advertisement via our e-alert system, which is emailed to our membership. The appropriate contact regarding circulating your call to participate is via the CENA Secretariat: national@cena.org.au.

The appropriate contact should you wish to consider publishing the findings from this study in the *Australasian Emergency Nursing Journal* is via Mr Ramon Shaban, Editor-in-Chief: editor@cena.org.au.

Also, I would like to remind you that all publication outputs arising from CENA approved studies must include the following statement:

> *"This study was generously supported by the College of Emergency Nursing Australasia (CENA). The views of these researchers do not necessarily represent the views of CENA"*

It is the responsibility of the researcher(s) to maintain contact with the CENA Research committee Chair regarding any publications or presentations that arise out of the study.

We wish you well with this study and look forward to the findings and welcome future publications. If you have further questions please do not hesitate to contact me. Please quote the reference: **CENA/RC/2015/1/RF** in future communication.

Kind Regards,

Karen Hammad
CENA Company Director/ Chair of Research Committee

APPENDIX F –Organisational Approval Letters-AASW

AASW
Australian Association of Social Workers

National Office – Melbourne
Level 7, 14-20 Blackwood Street
North Melbourne Vic 3051
PO Box 2008
Royal Melbourne Hospital
Parkville, VIC 3050
T 02 6232 3900
F 03 9328 5670
www.aasw.asn.au

16 January 2015

Rashid Flewellen
PhD Candidate, Principal Investigator
National Drug Research Institute
Curtin University WA

Dear Rashid

Re: Application for research to be advertised to AASW members

A representative of the AASW's National Research Committee has recently reviewed your application to have your research: *Behavioural Intention to Provide Screening and Brief Intervention for Alcohol-Related Injury in the Emergency Department;* advertised to AASW members.

I am pleased to advise that your application has been approved for advertisement on our website. It was described by the reviewer as a well-developed research proposal, and will likely be of interest to AASW members working in hospital and/or drug and alcohol settings.

If you could please send through some text (approximately 100 words) advertising your research to our members, as well as any links to the research website; survey; and your contact details if applicable, that would be great.

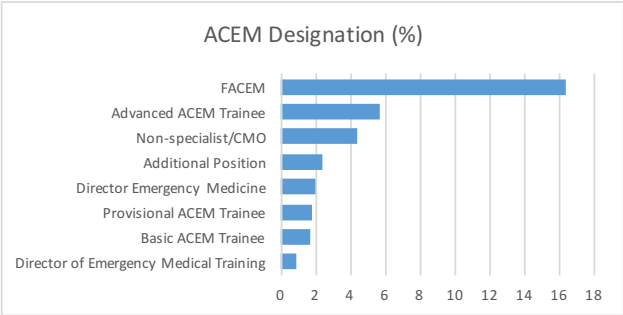
If you have any questions or queries, please don't hesitate to contact me on 03 9320 1044.

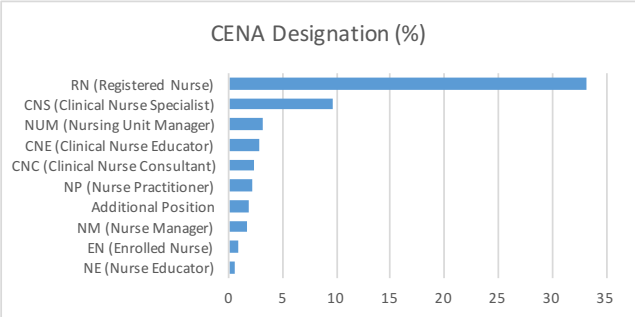
Yours sincerely,

Fran Hardcastle
Professional Officer - Standards

APPENDIX G –Professional/Organisation Designation

Doctor ACEM Designation		
Director of Emergency Medical Training	5	0.9
Basic ACEM Trainee	9	1.7
Provisional ACEM Trainee	10	1.8
Director Emergency Medicine	11	2
Additional Position	13	2.4
Non-specialist/CMO	24	4.4
Advanced ACEM Trainee	31	5.7
FACEM	89	16.4
Total	192	
Nurse CENA Designation		
NE (Nurse Educator)	3	0.6
EN (Enrolled Nurse)	5	0.9
NM (Nurse Manager)	9	1.7
Additional Position	10	1.8
NP (Nurse Practitioner)	12	2.2
CNC (Clinical Nurse Consultant)	13	2.4
CNE (Clinical Nurse Educator)	16	2.9
NUM (Nursing Unit Manager)	17	3.1
CNS (Clinical Nurse Specialist)	52	9.6
RN (Registered Nurse)	180	33.1
Total	317	
Allied Health Designation		
Social Worker	15	2.8
Care Coordinator	11	2
Physiotherapist	4	0.7
Additional Allied Health	4	0.7
Total	34	





APPENDIX H –Pattern Matrix & Full Survey Items

	ED_ARI Questionnaire	Pattern Matrix					
	Survey Items	*Component*					
	1-BEH INT	1-Behavioural Intention	2-Social Norms	3-Attitude-ARI	4-PBC-Self Efficacy	5-PBC-Control	6-Role Legitimacy
Q42	I am interested in receiving training in alcohol screening and brief intervention	0.83					
Q43	I am interested in receiving a smart phone application for alcohol screening and brief intervention	0.822					
Q33	If the ED provided practical tools such as smart phone apps for alcohol screening & brief intervention, I would conduct a screening and brief intervention	0.794					
Q38	If alcohol screening & brief intervention policies and procedures were available in the ED, I would conduct a screening and brief intervention	0.725					
Q39	I support the concept of alcohol screening and brief intervention for injured ED patients	0.613					
Q28	Meeting the expectation of my colleagues to conduct a screening and brief intervention for alcohol-related injuries is important to me	0.532					
Q30	It is worthwhile to identify and provide an alcohol brief intervention to patients who present with alcohol-related injuries to the ED	0.449				-0.311	
	2-SOC NORM						
Q20	When patients come to the ED with an alcohol-related injury, there is an expectation to conduct an alcohol screening and brief intervention with them		0.683				
Q31	I am not currently aware of any alcohol screening tools/resources in my ED for patients who have had an alcohol-related injury		0.672				
Q36	Most people who work with alcohol-related injuries in the ED do not think addressing alcohol issues is our responsibility and we should quickly discharge these cases		0.614				
Q41	I am highly likely to conduct an alcohol screen and brief intervention for alcohol-related injury in the next 30 days		0.593				
	6-ROLE LEG						
Q34	I feel a responsibility to ask injured patients for information that is related to their drinking behaviour	0.347	0.453				0.453
Q25	It is within my role responsibility to offer patients a brief intervention for harmful/hazardous alcohol use	0.343	0.422				0.422
	3-ATT_ARI						
Q19	Alcohol-related injuries are time-consuming for clinicians to respond to			-0.747			
Q29	I have had bad experiences with ED cases that involved alcohol-related injuries			-0.671			
Q24	It has been pleasant to screen and provide brief interventions for alcohol-related problems in the ED			-0.564		-0.324	
Q35	When patients come to the ED with an alcohol-related injury, there is not enough time to conduct an alcohol screening and brief intervention with them			-0.539			
Q26	Alcohol-related injuries are the result of patients making poor decisions			-0.43		0.313	
	4-PBC-SE						
Q32	It is difficult to identify and distinguish patients with alcohol dependence				0.795		
Q21	It is easy to identify and distinguish patients with hazardous/harmful drinking				0.738		
Q37	I am confident I can appropriately screen and advise patients in the ED about drinking and its effect on injury risk				0.495		
	5-PBC-Control						
Q40	The decision to perform alcohol screening and brief intervention for injured patients in the ED is entirely up to me					-0.617	
Q22	Brief interventions are effective for managing alcohol-related issues associated with injury					-0.591	
Q18	The ED is a practical setting to address individual patterns of harmful alcohol consumption					-0.535	
Q23	Screening for alcohol harm in injury cases will detect risk factors for future injuries	0.302				-0.431	
Q27	It is easy for me to perform an alcohol brief intervention for injured patients in the ED					-0.356	

APPENDIX I – ED-ARI Final Survey

Introduction

Q1.

ALCOHOL-RELATED INJURY IN THE EMERGENCY DEPARTMENT: A CLINICIAN SURVEY

The purpose of this survey is to gain an understanding of current attitudes and responses to alcohol-related injuries when they present to the Emergency Department. Some questions will ask about brief interventions. Brief interventions usually provide advice about risks associated with drinking, possible links between alcohol use and reason for admission, and options to make changes.

This survey is part of a doctoral study to explore the public health care response to alcohol harms in Australia. All responses will remain confidential and anonymous.

There will be an opportunity at the end of this survey to be redirected to a separate link where you will be entered into a gift draw for one of 20 $50 gift vouchers

NDRI national drug research institute | Curtin University

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number HR 172/2013). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or by emailing hrec@curtin.edu.au.

Demographics

Q2. **Your age:**

- 20-29
- 30-39
- 40-49
- 50-59
- 60-69
- >70

Q3. **Your gender:**

- Male
- Female
- Other

Q4. **Which category best describes your profession:**

- Doctor
- Nurse
- Social Worker
- Care Coordinator
- Occupational Therapist
- Physiotherapist
- Additional Allied Health (Please Specify)

Q5. **What best describes your position:**

- Basic ACEM Trainee
- Provisional ACEM Trainee
- Advanced ACEM Trainee
- FACEM
- Non-specialist/CMO
- Director of Emergency Medical Training
- Director Emergency Medicine
- Additional Position (Please Specify)

Q6. **What best describes your position:**

- RN (Registered Nurse)
- AIN (Assistant In Nursing)
- EN (Enrolled Nurse)
- CNS (Clinical Nurse Specialist)
- CNE (Clinical Nurse Educator)
- NE (Nurse Educator)
- CNC (Clinical Nurse Consultant)
- NP (Nurse Practitioner)
- NUM (Nursing Unit Manager)
- NM (Nurse Manager)
- Additional Position (Please Specify)

Q7. **Are you a member of CENA (College of Emergency Nursing Australasia)?**

- Yes
- No

Q8. **Are you a member of AASW (Australian Association of Social Workers)?**

- Yes
- No

Q9.
Average hours worked per week in ED (past 12 months):

Q10.
Estimate how long you have worked in the ED as a dedicated ED clinician:

Q11.
The State in which your hospital/ED is located:

- ACT
- TAS

- QLD
- NSW
- NT
- SA
- VIC
- WA
- NZ
- Elsewhere (please specify)

Q12.
In what type of hospital do you currently perform most of your Emergency Medicine work:

- Metropolitan-Major Referral
- Metropolitan-Urban District
- Regional/Rural Base
- Private Hospital
- Paediatric Only
- Other (Please specify

Q13.
How close is your hospital/ED to a nighttime entertainment district (i.e. a CBD that has extended hours alcohol trading):

- 0-5km
- 6-10km
- 11-20km
- 21-40km
- 41+km

Q14.
Do you have training in alcohol screening tools (e.g. formal course, in-service training, continuing education on tools like the AUDIT, RAPS, CAGE, CRAFFT, ASSIST etc)?

- Yes
- No
- Don't Know/Don't Recall

Q15.
Do you have training in alcohol brief interventions (e.g. formal course, in-service training, continuing education)? Brief interventions usually provide advice about risks associated with drinking, possible links between alcohol use and reasons for admission, and options to make changes.

- Yes
- No
- Don't Know/Don't Recall

Q16. **What type of format/device are you using to complete this survey?**

- Desktop/Laptop
- Mobile Phone/Handheld Device
- Other Device (Please specify)

Section I

Q17.
Read each statement and answer according to how you feel. Choose the one response that best describes your current feelings.

Place cursor over "brief intervention" for a definition reminder

To what extent do you agree/disagree that:

Q18.
The **ED** is a **practical setting** to address individual patterns of harmful alcohol consumption

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q19.
Alcohol-related injuries **are time-consuming** for clinicians to respond to

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q20.
When patients come to the ED with an alcohol-related injury, there is an **expectation to conduct** an alcohol screening and brief intervention with them.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q21.
It is easy to **identify and distinguish** patients with hazardous/harmful drinking

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree

Q22.
Brief interventions are effective for managing alcohol-related issues associated with injury

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q23.
Screening for alcohol harm in injury cases will **detect risk factors** for future injuries

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q24.
It has been **pleasant to screen and provide brief interventions** for alcohol-related problems in the ED

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q25.
It is within **my role responsibility** to offer patients a brief intervention for harmful/hazardous alcohol use

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Section II

Q26.
Alcohol-related injuries are the result of patients making **poor decisions**

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q27.
It is easy for me to **perform an alcohol brief intervention** for injured patients in the ED

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q28.
Meeting the **expectation of my colleagues** to conduct a screening and brief intervention for alcohol-related injuries is important to me

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q29.
I have had **bad experiences** with ED cases that involved alcohol-related injuries

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q30.
It is **worthwhile to identify and provide an alcohol brief intervention** to patients who present with alcohol-related injuries to the ED

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q31. I am **not** currently aware of any **alcohol screening tools/resources** in my ED for patients who have had an alcohol-related injury

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q32. It is difficult to identify and distinguish patients with alcohol dependence

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q33. If the **ED provided** practical tools such as **smart phone apps** for alcohol screening & brief intervention, I would conduct a screening and brief intervention

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q34.
I feel a **responsibility** to ask **injured** patients for information that is related to their drinking behaviour

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q35.
When patients come to the ED with an alcohol-related injury, there is **not enough time** to conduct an **alcohol screening** and **brief intervention** with them

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Section III

Q36.
Most people who work with alcohol-related injuries in the ED do **not** think addressing alcohol issues is our responsibility and we should quickly discharge these cases

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q37.
I am confident I **can appropriately screen and advise** patients in the ED about drinking and its effect on injury risk

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q38.
If alcohol screening & brief intervention **policies and procedures were available** in the ED, I would conduct a screening and brief intervention

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q39.
I **support** the concept of **alcohol screening and brief intervention** for injured ED patients

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q40.
The decision to perform **alcohol screening and brief intervention** for injured patients in the ED is entirely up to me

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q41.
I am highly likely to **conduct an alcohol screen and brief intervention** for alcohol-related injury in the next 30 days

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q42.
I am interested in receiving **training** in **alcohol screening** and **brief intervention**

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

Q43.
I am interested in receiving a **smart phone application** for **alcohol screening** and **brief intervention**

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

SAAPPQ

Q44. **NOTE: Responses in this last section are reversed-strongly agree is on left and strongly disagree on right.**

Q45.
I feel I know enough about causes of drinking problems to carry out my role when working with drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q46.
I feel I can appropriately advise my patients about drinking and its effects

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q47.
I feel I do not have much to be proud of when working with drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q48.
All in all I am inclined to feel I am a failure with drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q49.
I want to work with drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q50.
Pessimism is the most realistic attitude to take towards drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q51.
I feel I have the right to ask patients questions about their drinking when necessary

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q52.
I feel that my patients believe I have the right to ask them questions about drinking when necessary

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q53.
In general, it is rewarding to work with drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Q54.
In general, I like drinkers

Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
○	○	○	○	○	○	○

Last Occasion

Q55. **How many days since you last treated a patient with an alcohol-related injury in the ED?**

Q56.
When was the last occasion you had 4+ standard drinks of alcohol?**

The above guide contains 5 examples of **1 standard drink.
The far right example is a bottle of full strength beer which contains **1.5 standard drinks**

- Yesterday
- Last 7 Days
- Last 30 Days
- Less Than 6 Months
- More Than 6 Months
- Don't Drink
- No Response

Q57. **Please provide any additional comments, concerns or thoughts.**

REFERENCES

1. Lancet. Alcohol misuse needs a global response. The Lancet 2009;373(9662):433.

2. WHO. Global Information System on Alcohol and Health (GISAH). In. Geneva: World Health Organization; 2014.

3. Gentilello LM. Alcohol and injury: American College of Surgeons Committee on trauma requirements for trauma center intervention. J Trauma 2007;62(6 Suppl):S44-5.

4. Wiebe DJ, Blackstone MM, Mollen CJ, Culyba AJ, Fein JA. Self-reported Violence-related Outcomes for Adolescents Within Eight Weeks of Emergency Department Treatment for Assault Injury. Journal of Adolescent Health 2011;49(4):440-442.

5. Cunningham RM, Carter PM, Ranney M, et al. Violent reinjury and mortality among youth seeking emergency department care for assault-related injury: A 2-year prospective cohort study. JAMA Pediatrics 2015;169(1):63-70.

6. McCoy AM, Como JJ, Greene G, Laskey SL, Claridge JA. A novel prospective approach to evaluate trauma recidivism: the concept of the past trauma history. Journal of Trauma and Acute Care Surgery 2013;75(1):116-121.

7. Worrell SS, Koepsell TD, Sabath DR, Gentilello LM, Mock CN, Nathens AB. The risk of reinjury in relation to time since first injury: a retrospective population-based study. Journal of Trauma and Acute Care Surgery 2006;60(2):379-384.

8. Egerton-Warburton D, Gosbell A, Wadsworth A, Moore K, Richardson DB, Fatovich DM. Perceptions of Australasian emergency department staff of the impact of alcohol-related presentations. Med J Aust 2016;204(4):155.

9. Hasin D, Hatzenbuehler ML, Keyes K, Ogburn E. Substance use disorders: Diagnostic and Statistical Manual of Mental Disorders, (DSM-IV) and International Classification of Diseases, (ICD-10). Addiction 2006;101(s1):59-75.

10. Organization WH. The ICD-10 Classification of Mental and Behavioural Disorders: Diagnostic Criteria for Research: World Health Organization; 1993.

11. WHO. Global status report on alcohol and health-2014: World Health Organization; 2014.

12. Lim SS. Comparative risk assessment of burden disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions 1990-2010 : a systematic analysis for the global burden of disease study 2010. Lancet 2012;380:2224-60.

13. WHO. Alcohol and Injury in Emergency Departments: Summary of the Report from the WHO Collaborative Study on Alcohol and Injuries. Geneva: World Health Organization; 2007.

14. Naghavi M, Wang H, Lozano R, Davis A, Liang X, Zhou M, et al. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2015;385(9963):117-171.

15. Cherpitel C, Borges G, Giesbrecht N, Hungerford D, Peden M, Poznyak V, et al. Alcohol and Injuries: Emergency Department Studies in an International Perspective. Geneva: World Health Organization; 2009.

16. Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. The Lancet 2009;373(9682):2223-2233.

17. Laatikainen T, Manninen L, Poikolainen K, Vartiainen E. Increased mortality related to heavy alcohol intake pattern. J Epidemiol Community Health 2003;57(5):379-84.

18. Connor J. Alcohol consumption as a cause of cancer. Addiction 2016.

19. AICR. Policy and Action for Cancer Prevention. Food, Nutrition, and

Physical Activity: a Global Perspective. Washington DC: World Cancer Research Fund / American Institute for Cancer Research; 2009.

20. Bagnardi V, Rota M, Botteri E, Tramacere I, Islami F, Fedirko V, et al. Alcohol consumption and site-specific cancer risk: a comprehensive dose–response meta-analysis. British journal of cancer 2014.

21. Winstanley MH, Pratt IS, Chapman K, Griffin HJ, Croager EJ, Olver IN, et al. Alcohol and cancer: a position statement from Cancer Council Australia. Med J Aust 2011;194(9):479-482.

22. Brewer RD, Swahn MH. Binge drinking and violence. JAMA : the journal of the American Medical Association 2005;294(5):616.

23. Hoaken PNS, Stewart SH. Drugs of abuse and the elicitation of human aggressive behavior. Addictive Behaviors 2003;28(9):1533-1554.

24. Transportation UDo. Traffic Safety Facts, 2008 Data. Alcohol-Impaired Driving. Washington, DC: US Department of Transportation; 2008.

25. Chikritzhs T, Catalano P, Stockwell T, Donath S, Ngo H, Young D, et al. Australian Alcohol Indicators, 1990-2001: Patterns of alcohol use and related harms for Australian states and territories. Perth, WA: National Drug Research Institute; Curtin University of Technology; 2003.

26. Chikritzhs T, Allsop S, Moodie R, Hall W. Per capita alcohol consumption in Australia: will the real trend please step forward? Medical Journal of Australia 2010;193:1-4.

27. Hobday M, Chikritzhs T, Liang W, Meuleners L. The effect of alcohol outlets, sales and trading hours on alcohol-related injuries presenting at emergency departments in Perth, Australia, from 2002 to 2010. Addiction 2015:n/a-n/a.

28. Chikritzhs T, Stockwell T, Naimi T, Andreasson S, Dangardt F, Liang W. Has the leaning tower of presumed health benefits from 'moderate' alcohol use finally collapsed? Addiction 2015;110(5):726-727.

29. Suh I, Shaten BJ, Cutler JA, Kuller LH. Alcohol use and mortality from coronary heart disease: the role of high-density lipoprotein cholesterol. The Multiple Risk Factor Intervention Trial Research Group. Ann Intern Med 1992;116(11):881-7.

30. Corrao G, Rubbiati L, Bagnardi V, Zambon A, Poikolainen K. Alcohol and coronary heart disease: a meta-analysis. Addiction 2000;95(10):1505-1523.

31. Ramstedt M. Fluctuations in male ischaemic heart disease mortality in Russia 1959–1998: Assessing the importance of alcohol. Drug and Alcohol Review 2009;28(4):390-395.

32. O'Keefe JH, Bybee KA, Lavie CJ. Alcohol and Cardiovascular HealthThe Razor-Sharp Double-Edged Sword. Journal of the American College of Cardiology 2007;50(11):1009-1014.

33. Chokshi DA, El-Sayed AM, Stine NW. J-shaped curves and public health. JAMA 2015;314(13):1339-1340.

34. Plunk AD, Syed-Mohammed H, Cavazos-Rehg P, Bierut LJ, Grucza RA. Alcohol Consumption, Heavy Drinking and Mortality: Re-Thinking the J-Shaped Curve. Alcoholism, clinical and experimental research 2014;38(2):471-478.

35. Thompson PL. J-curve revisited: cardiovascular benefits of moderate alcohol use cannot be dismissed. The Medical Journal of Australia 2013;198(8):419-422.

36. Knott CS, Coombs N, Stamatakis E, Biddulph JP. All cause mortality and the case for age specific alcohol consumption guidelines: pooled analyses of up to 10 population based cohorts; 2015.

37. Cao Y, Willett WC, Rimm EB, Stampfer MJ, Giovannucci EL. Light to moderate intake of alcohol, drinking patterns, and risk of cancer: results from two prospective US cohort studies. 2015.

38. Fekjær HO. Alcohol—a universal preventive agent? A critical analysis. Addiction 2013:n/a-n/a.

39. Fillmore K, Kerr W, Stockwell T, Chikritzhs T, Bostrum A. Moderate alcohol use and reduced mortality risk: systematic error in prospective studies. 2006.

40. Livingston M, Wilkinson C. Per-capita Alcohol Consumption and All-cause Male Mortality in Australia, 1911–2006; 2013.

41. Cherpitel C, Ye Y, Bond J, Rehm J, Poznyak V, Macdonald S, et al. Multi-level analysis of alcohol-related injury among emergency department patients: a cross-national study*. Addiction 2005;100(12):1840-1850.

42. Kaner E, Newbury-Birch D, Heather N. Chapter ten - Brief Intervention. In: Miller PM, editor. Evidence-Based Addiction Treatment. San Diego: Academic Press; 2009. p. 189-213.

43. Dent A, Phillips GA, Chenhall AJ, McGregor LR. The heaviest repeat users of an inner city emergency department are not general practice patients. Emerg Med (Fremantle) 2003;15(4):322-9.

44. Spurling MC. Alcohol-Related Injuries: Evidence for the Prevention Paradox. The Annals of Family Medicine 2005;3(1):47-52.

45. Rossow I, Romelsjö A. The extent of the 'prevention paradox'in alcohol problems as a function of population drinking patterns. Addiction 2006;101(1):84-90.

46. Kreitman N. Alcohol Consumption and the Preventive Paradox British Journal of Addiction 1986;81(3):353-363.

47. Dent A, Weiland TJ, Phillips GA, Lee NK. Opportunistic screening and clinician-delivered brief intervention for high-risk alcohol use among emergency department attendees: a randomized controlled trial. Emergency medicine Australasia : EMA 2008;20(2):121-128.

48. Baugher A, Haley Jr L, Adedinsewo D, Kelley M, Hankin A. At Risk Alcohol Use Predicts Risk of Repeat Emergency Department Visit for Trauma. Annals of Emergency Medicine 2014;64(4, Supplement):S2.

49. Shield KD, Gmel G, Patra J, Rehm J. Global burden of injuries attributable to alcohol consumption in 2004: a novel way of calculating the burden of injuries attributable to alcohol consumption. Population Health Metrics 2012;10.

50. Cherpitel C, Ye Y, Bond J, Borges G, Chou P, Nilsen P, et al. Multi-level analysis of alcohol-related injury and drinking pattern: emergency department data from 19 countries. Addiction 2012;107(7):1263-72.

51. LaValley J. Opportunities for intervention: Characteristics of alcohol related visits to United States emergency departments, 2003--2007 [M.P.H.]. Ann Arbor: University of Nevada, Las Vegas; 2010.

52. Babor T, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, brief intervention, and referral to treatment (SBIRT): toward a public health approach to the management of substance abuse. Substance Abuse 2007;28(3):7-30.

53. Bernstein E, Bernstein J, Stein JB, Saitz R. SBIRT in Emergency Care Settings: Are We Ready to Take it to Scale? Academic Emergency Medicine 2009;16(11):1072-1077.

54. Broderick KB, Ranney ML, Vaca FE, D'Onofrio G, Rothman RE, Rhodes KV, et al. Study Designs and Evaluation Models for Emergency Department Public Health Research. Academic Emergency Medicine 2009;16(11):1124-1131.

55. Cherpitel C. Alcohol and injuries: a review of international emergency room studies since 1995. Drug and Alcohol Review 2007;26(2):201-214.

56. Cherpitel C, Soghikian K, Hurley LB. Alcohol-related health services use and identification of patients in the emergency department. Ann Emerg Med 1996;28(4):418-23.

57. Désy PM, Howard PK, Perhats C, Li S. Alcohol screening, brief intervention, and referral to treatment conducted by emergency nurses: an impact evaluation. In: Journal of Emergency Nursing: Emergency Department Nurses Association; 2010. p. 538-45.

58. Indig D, Copeland J, Conigrave KM, Rotenko I. Attitudes and beliefs of emergency department staff regarding alcohol-related presentations. International Emergency Nursing 2009;17(1):23-30.

59. Nordqvist C, Johansson K, Lindqvist K, Bendtsen P. Attitude changes among emergency department triage staff after conducting routine alcohol screening. Addict Behav 2006;31(2):191-202.

60. Schermer CR, Gentilello LM, Hoyt DB, Moore EE, Moore JB, Rozycki GS, et al. National Survey of Trauma Surgeons' Use of Alcohol Screening and Brief Intervention. Journal of Trauma-Injury Infection & Critical Care 2003;55(5):849-856.

61. Boudreaux ED, Cydulka R, Bock B, Borrelli B, Bernstein S. Conceptual Models of Health Behavior: Research in the Emergency Care Settings. Academic Emergency Medicine 2009;16(11):1120-1123.

62. Davidson A, Babl FE. A primer for clinical researchers in the emergency department: Part I: Ethical and regulatory background. Emergency Medicine Australasia 2010;22(5):399-406.

63. WHO. WHO collaborative study group on alcohol and injuries: final report. Geneva: Department of Mental Health and Substance Abuse; Department of Injuries and Violence Prevention; 2007.

64. Cherpitel C, Bond J, Ye Y, Borges G, Macdonald S, Giesbrecht N. A cross-national meta-analysis of alcohol and injury: data from the Emergency Room Collaborative Alcohol Analysis Project (ERCAAP). Addiction 2003;98(9):1277-1286.

65. Chikritzhs T, Evans M, Gardner C, Liang W, Pascal R, Stockwell T, et al. Australian Alcohol Aetiologic Fractions for Injuries Treated in Emergency Departments. Perth, National Drug Research Institute, Curtin University; 2011.

66. Egerton-Warburton D, Gosbell A, Wadsworth A, Fatovich D, Richardson D. Survey of alcohol-related presentations to Australasian emergency departments. The Medical journal of Australia 2014;201(10):584-587.

67. Indig D, Eyeson-annan M, Copeland J, Conigrave K. The effects of alcohol consumption, psychological distress and smoking status on emergency department presentations in New South Wales, Australia. BMC Public Health 2007;7(1):46.

68. Kerr WC, Ye Y, Cherpitel CJ. Racial/Ethnic Disparities in the Risk of Injury Related to the Frequency of Heavy Drinking Occasions. Alcohol and Alcoholism 2015.

69. Butler K, Reeve R, Arora S, Viney R, Goodall S, Gool K, et al. The hidden costs of drug and alcohol use in hospital emergency departments. Drug and alcohol review 2015.

70. Ogeil RP, Room R, Matthews S, Lloyd B. Alcohol and burden of disease in Australia: the challenge in assessing consumption. Australian and New Zealand Journal of Public Health 2015;39(2):121-123.

71. Vitesnikova J, Dinh M, Leonard E, Boufous S, Conigrave K. Use of AUDIT-C as a tool to identify hazardous alcohol consumption in admitted trauma patients. Injury 2014(0).

72. Poynton S, Donnelly N, Weatherburn D, Fulde G, Scott L. The Role of Alcohol in Injuries Presenting to St Vincent's Hospital Emergency Department and the Associated Short-term Costs. Alcohol Studies Bulletin 2005;6(December):16.

73. Czech S, Shakeshaft AP, Byrnes JM, Doran CM. Comparing the cost of alcohol-related traffic crashes in rural and urban environments. Accident Analysis & Prevention 2010;42(4):1195-1198.

74. Havard A, Shakeshaft AP, Conigrave KM. Prevalence and characteristics of patients with risky alcohol consumption presenting to emergency departments in rural Australia. Emergency Medicine Australasia 2012;24(3):266-276.

75. Indig D, Copeland J, Conigrave KM. Comparing methods of detecting alcohol-related emergency department presentations. Emerg Med J 2009;26(8):596-600.

76. Borges G, Cherpitel C, Orozco R, Bond J, Ye Y, Macdonald S, et al. Multicentre study of acute alcohol use and non-fatal injuries: data from the WHO collaborative study on alcohol and injuries. Bulletin of the World Health Organization 2006;84(6):453-460.

77. Gmel G, Daeppen JB. Conceptual issues in emergency roon studies and paths forward. In: Cherpitel C, Borges G, Giesbrecht N, Hungerford D, Peden M, Poznyak V, et al., editors. Alcohol and Injuries: Emergency Department Studies in an International Perspective. Geneva: World Health Organization; 2009. p. 115-131.

78. Foege W. Injury Control: General Books; 2009.

79. van Amsterdam J, van den Brink W. The high harm score of alcohol. Time for drug policy to be revisited? Journal of psychopharmacology 2013;27(3):248.

80. Lee GA, Forsythe M. Is alcohol more dangerous than heroin? The physical, social and financial costs of alcohol. Int Emerg Nurs 2011;19(3):141-5.

81. Laslett A, Catalano P, Chikritzhs T, Dale C, Doran C, Ferris J, et al. The Range and Magnitude of Alcohol's Harm to Others. In; 2010.

82. Room R, Babor T, Rehm J. Alcohol and public health. The Lancet 2005;365(9458):519-530.

83. Gmel G, Daeppen J-B. Recall bias for seven-day recall measurement of alcohol consumption among emergency department patients: implications for case-crossover designs *.(Report). Journal of Studies on Alcohol and Drugs 2007;68(2):303.

84. Rehm J, Gmel G, Sempos C, Trevisan M. Alcohol-related mortality and morbidity. Alcohol Res Health 2003;27:39-51.

85. Liang W, Chikritzhs T. Examining the Relationship between Heavy Alcohol Use and Assaults: With Adjustment for the Effects of Unmeasured Confounders. BioMed Research International 2015;2015:10.

86. Zeisser C, Stockwell TR, Chikritzhs T, Cherpitel C, Ye Y, Gardner C. A systematic review and meta-analysis of alcohol consumption and injury risk as a function of study design and recall period. Alcohol Clin Exp Res 2013;37 Suppl 1:E1-8.

87. Fulde GW, Smith M, Forster SL. Presentations with alcohol-related serious injury to a major Sydney trauma hospital after 2014 changes to liquor laws. Med J Aust 2015;203(9):366.

88. Roche AM, Freeman T, Skinner N. From data to evidence, to action: findings from a systematic review of hospital screening studies for high risk alcohol consumption. Drug Alcohol Depend 2006;83(1):1-14.

89. Eckardt MJ, File SE, Gessa GL, Grant KA, Guerri C, Hoffman PL, et al. Effects of Moderate Alcohol Consumption on the Central Nervous System*. Alcoholism: Clinical and Experimental Research 1998;22(5):998-1040.

90. Gmel G, Gutjahr E, Rehm J. How Stable Is the Risk Curve between Alcohol and All-Cause Mortality and What Factors Influence the Shape? A Precision-Weighted Hierarchical Meta-Analysis. European Journal of Epidemiology 2003;18(7):631-642.

91. Chikritzhs T, Fillmore K, Stockwell T. A healthy dose of scepticism: four good reasons to think again about protective effects of alcohol on coronary heart disease. Drug and Alcohol Review 2009;28(4): 441-444.

92. Taylor B, Irving HM, Kanteres F, Room R, Borges G, Cherpitel C, et al. The more you drink, the harder you fall: A systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. Drug and Alcohol Dependence 2010;110(1–2):108-116.

93. Jewell NP. Statistics for Epidemiology. Hoboken: Hoboken : Taylor and Francis; 2004.

94. Albano J, Aljundi B, Anderson B, Argyros G, Askari V, Avula X, et al. Models for Aircrew Safety Assessment: Uses, Limitations and Requirements. 1999.

95. MacKenzie EJ. Epidemiology of injuries: current trends and future challenges. Epidemiologic reviews 2000;22(1):112.

96. Kraemer HC, Stice E, Kazdin A, Offord D, Kupfer D. How Do Risk Factors Work Together? Mediators, Moderators, and Independent, Overlapping, and Proxy Risk Factors. American Journal of Psychiatry 2001;158(6):848-856.

97. McLeod R, Stockwell T, Stevens M, Phillips M. The relationship between alcohol consumption patterns and injury. Addiction 1999;94(11):1719-1734.

98. Henley G, Harrison JE. Injury severity scaling: A comparison of methods for measurement of injury severity: Australian Institute of Health and Welfare; 2009.

99. Curtis K, Caldwell E, Delprado A, Munroe B. Traumatic injury in Australia and New Zealand. Australasian Emergency Nursing Journal 2012;15(1):45-54.

100. Allbon P. Health system expenditure on disease and injury in Australia, 2004-05. Canberra: Australian Institute of Health and Welfare 2010.

101. Dinh-Zarr T, Goss C, Heitman E, Roberts I, DiGuiseppi C. Interventions for preventing injuries in problem drinkers (Updated). Cochrane Database Syst Rev 2009(3):CD001857.

102. Gentilello LM, Rivara FP, Donovan DM, Jurkovich GJ, Daranciang E, Dunn CW, et al. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. Annals of surgery 1999;230(4):473.

103. Roche AM, Watt K, McClure R, Purdie DM, Green D. Injury and alcohol: a hospital emergency department study. Drug and Alcohol Review 2001;20(2):155-166.

104. Tovell A, McKenna K, Bradley C, Pointer S. Hospital separations due to injury and poisoning, Australia 2009–10. In: Injury research and statistics series no. 69. Cat. no. INJCAT 145. Canberra: AIHW; 2012.

105. Williams M, Mohsin M, Weber D, Jalaludin BIN, Crozier J. Alcohol consumption and injury risk: A case-crossover study in Sydney, Australia. Drug and Alcohol Review 2011;30(4):344-354.

106. Humphrey G, Casswell S, Han DY. Alcohol and injury among attendees at a New Zealand emergency department. 2003.

107. O'Keeffe T, Rhee P, Shafi S, Friese RS, Gentilello LM. Alcohol use increases diagnostic testing, procedures, charges, and the risk of hospital admission: a population-based study of injured patients in the emergency department. The American Journal of Surgery 2013;206(1):16.

108. Siskind V, Steinhardt D, Sheehan M, O'Connor T, Hanks H. Risk factors for fatal crashes in rural Australia. Accident Analysis & Prevention 2011;43(3):1082-1088.

109. Akin J, Johnson JA, Seale JP, Kuperminc GP. Using process indicators to optimize service completion of an ED drug and alcohol brief intervention program. The American Journal of Emergency Medicine 2015;33(1):37-42.

110. Lesjak MS, McMahon GJ, Zanette L. Alcohol harm and cost at a community level: data from police and health. Rural Remote Health 2008;8(2):878.

111. Shults RA, Elder RW, Hungerford DW, Strife BJ, Ryan GW. Emergency department visits for alcohol-related unintentional traumatic injuries, United States, 2001. Journal of Safety Research 2009;40(4):329-331.

112. Harris AH, Lembke A, Henderson P, Gupta S, Moos R, Bradley KA. Risk of future trauma based on alcohol screening scores: a two-year prospective cohort study among US veterans. Addict Sci Clin Pract 2012;7(1):6.

113. Harris SK, Knight JR. Putting the Screen in Screening: Technology-Based Alcohol Screening and Brief Interventions in Medical Settings. Alcohol Research: Current Reviews 2014;36(1):63-79.

114. Woolard R, Cherpitel C, Thompson K. Brief Intervention for Emergency Department Patients with Alcohol Misuse: Implications for Current Practice. Alcoholism Treatment Quarterly 2011;29(2):146-157.

115. Rivara FP, Koepsell TD, Jurkovich GJ, Gurney JG, Soderberg R. The effects of alcohol abuse on readmission for trauma. JAMA 1993;270(16):1962.

116. Longabaugh R, Minugh PA, Nirenberg TD, Clifford PR, Becker B, Woolard R. Injury as a Motivator to Reduce Drinking. Academic Emergency Medicine 1995;2(9):817-825.

117. Landy MS, Davey CJ, Quintero D, Pecora A, McShane KE. A Systematic Review on the Effectiveness of Brief Interventions for Alcohol Misuse among Adults in Emergency Departments. J Subst Abuse Treat 2016;61:1-12.

118. McGinnes RA, Hutton JE, Weiland TJ, Fatovich DM, Egerton-Warburton D. Review article: Effectiveness of ultra-brief interventions in the emergency department to reduce alcohol consumption: A systematic review. Emergency Medicine Australasia 2016:n/a-n/a.

119. Schmidt CS, Schulte B, Seo H-N, Kuhn S, O'Donnell A, Kriston L, et al. Meta-analysis on the effectiveness of alcohol screening with brief interventions for patients in emergency care settings. Addiction. 2016;111(5):783-794.

120. Kaner E, Dickinson HO, Beyer FR, Campbell F, Schlesinger C, Heather N, et al. Effectiveness of brief alcohol interventions in primary care populations. Cochrane Database of Systematic Reviews 2007(2):No.: CD004148. DOI: 10.1002/14651858.CD004148.pub3.

121. Woodruff SI, Eisenberg K, McCabe CT, Clapp JD, Hohman M. Evaluation of California's Alcohol and Drug Screening and Brief Intervention Project for Emergency Department Patients. Western Journal of Emergency Medicine 2013;14(3).

122. Wojnar M, Jakubczyk A. Brief Interventions for Hazardous and Harmful Alcohol Consumption in Accident and Emergency Departments. Frontiers in Psychiatry 2014;5:152.

123. D'Onofrio G, Degutis LC. Preventive care in the emergency department: Screening and brief intervention for alcohol problems in the emergency department: A systematic review. Academic Emergency Medicine 2002;9(6):627-38.

124. D'Onofrio G, Fiellin DA, Pantalon MV, Chawarski MC, Owens PH, Degutis LC, et al. A Brief Intervention Reduces Hazardous and Harmful Drinking in Emergency Department Patients. Annals of Emergency Medicine 2012;60(2):181-192.

125. Havard A, Shakeshaft AP, Sanson-Fisher R. Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries. Addiction 2008;103(3):368-376.

126. Daeppen J-B. A meta-analysis of brief alcohol interventions in emergency departments; few answers, many questions. Addiction 2008;103(3):377-378.

127. Cochran G, Field C, Caetano R. Injury-Related Consequences of Alcohol Misuse Among Injured Patients Who Received Screening and Brief Intervention for Alcohol: A Latent Class Analysis. Substance Abuse 2013;35(2):153-162.

128. Cochran G, Field C, Caetano R. Injury-Related Consequences of Alcohol Misuse Among Injured Patients Who Received Screening and Brief Intervention for Alcohol: A Latent Class Analysis. Substance abuse 2014;35(2):153-162.

129. Bernstein E, D'Onofrio G, Bernstein J, Aseltine R. The Impact of Screening, Brief Intervention, and Referral for Treatment on Emergency Department Patients' Alcohol Use. Annals of Emergency Medicine 2007;50(6):699-710.e6.

130. Bazargan-Hejazi S, Bing E, Bazargan M, Der-Martirosian C, Hardin E, Bernstein J, et al. Evaluation of a brief intervention in an inner-city emergency department. Annals of emergency medicine 2005;46(1):67-76.

131. Nilsen P, Baird J, Mello MJ, Nirenberg T, Woolard R, Bendtsen P, et al. A systematic review of emergency care brief alcohol interventions for injury patients. Journal of Substance Abuse Treatment 2008;35(2):184-201.

132. Saitz R. Alcohol screening and brief intervention in primary care: Absence of evidence for efficacy in people with dependence or very heavy drinking. Drug and Alcohol Review 2010;29(6):631-640.

133. Hungerford DW, Pollock DA, Todd KH. Acceptability of Emergency Department-based Screening and Brief Intervention for Alcohol Problems. Academic Emergency Medicine 2000;7(12):1383-1392.

134. Schermer CR. Feasibility of Alcohol Screening and Brief Intervention. Journal of Trauma and Acute Care Surgery 2005;59(3):S119-S123.

135. Nilsen P, Bendtsen P, McCambridge J, Karlsson N, Dalal K. When is it appropriate to address patients' alcohol consumption in health care—national survey of views of the general population in Sweden. Addictive Behaviors 2012;37(11):1211-1216.

136. Rush BR, Urbanoski KA, Allen BA. Physicians' enquiries into their patients' alcohol use: public views and recalled experiences. Addiction (Abingdon, England) 2003;98(7):895.

137. Hettema J, Cockrell S, Russo J, Corder-Mabe J, Yowell-Many A, Chisholm C, et al. Missed Opportunities: Screening and Brief Intervention for Risky Alcohol Use in Women's Health Settings. Journal of Women's Health 2015;24(8):648-654.

138. Cunningham R, Harrison SR, McKay MP, Mello MJ, Sochor M, Shandro JR, et al. National Survey of Emergency Department Alcohol Screening and Intervention Practices. Annals of Emergency Medicine 2010;55(6):556-562.

139. Egerton-Warburton D, Gosbell A, Moore K, Jelinek GA. Public health in Australasian emergency departments: Attitudes, barriers and current practices. Emergency Medicine Australasia 2015.

140. Bakhshi S, While AE. Health Professionals' Alcohol-Related Professional Practices and the Relationship between Their Personal Alcohol Attitudes and Behavior and Professional Practices: A Systematic Review. International journal of environmental research and public health 2013;11(1):218-248.

141. Aalto M, Hyvönen S, Seppä K. Do primary care physicians' own AUDIT scores predict their use of brief alcohol intervention? A cross-sectional survey. Drug and alcohol dependence 2006;83(2):169-173.

142. Crothers CE, Dorrian J. Determinants of nurses attitudes toward the care of patients with alcohol problems. ISRN Nursing 2011;2011.

143. Schluter PJ, Turner C, Benefer C. Long working hours and alcohol risk among Australian and New Zealand nurses and midwives: A cross-sectional study. International Journal of Nursing Studies 2012;49(6):701-709.

144. Davey CJ, Landy MSH, Pecora A, Quintero D, McShane KE. A realist review of brief interventions for alcohol misuse delivered in emergency departments. Systematic Reviews 2015;4:45.

145. Landy MS, Davey CJ, Quintero D, Pecora A, McShane KE. A Systematic Review on the Effectiveness of Brief Interventions for Alcohol Misuse Among Adults in Emergency Departments. Journal of Substance Abuse Treatment 2015.

146. Cucciare MA, Timko C. Bridging the gap between medical settings and specialty addiction treatment. Addiction 2015;110(9):1417-1419.

147. Glass JE, Hamilton AM, Powell BJ, Perron BE, Brown RT, Ilgen MA. Specialty substance use disorder services following brief alcohol intervention: a meta-analysis of randomized controlled trials. Addiction 2015;110(9):1404-1415.

148. Li G, Brady JE, Chen Q. Drug use and fatal motor vehicle crashes: A case-control study. Accident Analysis & Prevention 2013;60(0):205-210.

149. Rehm J, Klotsche J, Patra J. Comparative quantification of alcohol exposure as risk factor for global burden of disease. International Journal of Methods in Psychiatric Research 2007;16(2):66-76.

150. Gmel G, Bissery A, Gammeter R, Givel Jc, Calmes Jm, Yersin B, et al. Alcohol-attributable injuries in admissions to a Swiss emergency room—an analysis of the link between volume of drinking, drinking patterns, and preattendance drinking. Alcoholism: Clinical and Experimental Research 2006;30(3):501-509.

151. Watt K, Purdie DM, Roche AM, McClure RJ. Risk of injury from acute alcohol consumption and the influence of confounders. Addiction 2004;99(10):1262-1273.

152. Vinson DC, Maclure M, Reidinger C, Smith GS. A population-based case-crossover and case-control study of alcohol and the risk of injury *. Journal of Studies on Alcohol 2003;64(3):358.

153. Navarro HJ, Doran CM, Shakeshaft AP. Measuring costs of alcohol harm to others: A review of the literature. Drug and Alcohol Dependence 2011;114(2–3):87-99.

154. Rehm J, Room R. Aggregate versus individual data as bases for modeling the impact of alcohol on injury. In: Cherpitel C, Borges G, Giesbrecht N, Hungerford D, Peden M, Poznyak V, et al., editors. Alcohol and Injuries: Emergency Department Studies in an International Perspective. Geneva: World Health Organization; 2009. p. 95-106.

155. Chikritzhs T, Jonas H, Heale P, Stockwell T, Dietze P, Hanlin K, et al. National Alcohol Indicators Project Technical Report No. 1: Alcohol-caused Deaths and Hospitalisations in Australia, 1990-1997. In; 2000.

156. Roche AM, Freeman T. Brief interventions: good in theory but weak in practice. Drug Alcohol Rev 2004;23(1):11-8.

157. Ferns T, Cork A. Managing alcohol related aggression in the emergency department (Part I). Int Emerg Nurs 2008;16(1):43-7.

158. Gunasekara FI, Butler S, Cech T, Curtis E, Douglas M, Emmerson L, et al. How do intoxicated patients impact staff in the emergency department? An exploratory study. N Z Med J 2011;124(1336):14-23.

159. Skinner N, Roche AM, Freeman T, Addy D. Responding to alcohol and other drug issues: The effect of role adequacy and role legitimacy on motivation and satisfaction. Drugs: Education, Prevention, and Policy 2005;12(6):449-463.

160. Anderson P, Kaner E, Wutzke S, Funk M, Heather N, Wensing M, et al. Attitudes and management of alcohol problems in general practice: an interaction analysis based on findings of a WHO collaborative study. Alcohol and Alcoholism 2004;39(4):351-356.

161. O'Rourke M, Richardson LD, Wilets I, D'Onofrio G. Alcohol-related problems: emergency physicians' current practice and attitudes. J Emerg Med 2006;30(3):263-8.

162. Purhouse R, Brennan A, Latimer N, Meng Y, Rafia R, Jackson R, et al. Modelling to assess the effectiveness and cost-effectiveness of public health- related strategies and interventions to reduce alcohol-attributable harm in England using the Sheffield Alcohol Policy Model version 2.0. Sheffield UK: University of Sheffield; 2009.

163. Kraemer KL. The Cost-Effectiveness and Cost-Benefit of Screening and Brief Intervention for Unhealthy Alcohol Use in Medical Settings. Substance Abuse 2007;28(3):67-77.

164. Gentilello LM. Confronting the obstacles to screening and interventions for alcohol problems in trauma centers. J Trauma 2005;59(3 Suppl):S137-43; discussion S146-66.

165. Cochran G, Field C, DiClemente C, Caetano R. Latent Classes Among Recipients of a Brief Alcohol Intervention: A Replication Analysis. Behavioral Medicine 2016;42(1):29-38.

166. Forsythe M, Lee GA. The evidence for implementing alcohol screening and intervention in the emergency department – Time to act. International Emergency Nursing 2012;20(3):167-172.

167. Browne AL, Newton M, Gope M, Schug SA, Wood F, Allsop S. Screening for harmful alcohol use in Australian trauma settings. Injury 2013;44(1):110-117.

168. Johnson M, Jackson R, Guillaume L, Meier P, Goyder E. Barriers and facilitators to implementing screening and brief intervention for alcohol misuse: a systematic review of qualitative evidence. Journal of Public Health 2011;33(3):412-421.

169. Cooke M. The dissemination of a smoking cessation program: predictors of program awareness, adoption and maintenance. Health Promotion International 2000;15(2):113-124.

170. Ward B, Snow P, James E, Griffith J. The influence of parents and siblings on children's and adolescents' attitudes and behaviours towards alcohol: A critical review of the literature: Drinkwise Australia; 2010.

171. Bobo JK, Husten C. Sociocultural influences on smoking and drinking. Alcohol Res Health 2000;24(4):225-32.

172. Grube JW, Wallack L. Television beer advertising and drinking knowledge, beliefs, and intentions among schoolchildren. American Journal of Public Health 1994;84(2):254-259.

173. Borlagdan J, Freeman T, Duvnjak B, Lunnay B, Bywood PT, Roche AM. From Ideal to Reality: Cultural Contradictions and Young People's Drinking. Adelaide: National Centre for Education and Training on Addiction, Flinders University; 2010.

174. Roche AM, Bywood PT, Borlagdan J, Lunnay B, Freeman T, Lawton L, et al. Young People and Alcohol: The Role of Cultural Influences. In. National Centre for Education and Training on Addiction, Adelaide.; 2007.

175. Duff C, Scealy M, Rowland B. The Culture and Context of Alcohol Use in Community Sporting Clubs in Australia: Research into 'Attitudes' and 'Behaviour'; Executive Summary: Centre for Youth Drug Studies, Australian Drug Foundation; 2005.

176. McCreanor T, Greenaway A, Moewaka Barnes H, Borell S, Gregory A. Youth identity formation and contemporary alcohol marketing. Critical Public Health 2005;15(3):251-262.

177. Duff C. Drugs and Youth Cultures: Is Australia Experiencing the 'Normalization' of Adolescent Drug Use? Journal of Youth Studies 2003;6(4):433-447.

178. Straus R. Alcohol and Society. Psychiatric Annals 1973;3(10):8-17,21,23,26-29,32-33,37-39,42-44,49-51,55-65,68-69,72-76,80-81,84-88,92-99,102-103,106-107.

179. Featherstone M. Consumer Culture and Postmodernism: SAGE Publications; 2007.

180. Lewis MJ. A Rum State: Alcohol and State Policy in Australia, 1788-1988: Australian Government Publishing Service; 1992.

181. Roman P. Alcohol Abuse and Alcoholism. In: Bryant CD, Peck DL, editors. 21st Century Sociology: A Reference Handbook SAGE Publications; 2007. p. 405-414.

182. Pagano J, Graham NA, Frost-Pineda K, Gold MS. The physician's role in recognition and treatment of alcohol dependence and comorbid conditions. Psychiatric Annals 2005;35(6):473-481.

183. Enoch MA, Goldman D. Problem drinking and alcoholism: diagnosis and treatment. Am Fam Physician 2002;65(3):441-8.

184. Freimuth M. The "new look" in addiction assessment: Implications for medical education. Annals of Behavioral Science and Medical Education 2010;16(1):30-34.

185. Knox WJ. Attitudes of Psychiatrists and Psychologists Toward Alcoholism. American Journal of Psychiatry 1971;127(12):1675-1679.

186. Jellinek EM. The disease concept of alcoholism: Hillhouse Press; 1960.

187. Room R, Cahalan D. Problem Drinking in American Society. New Brunswick, NJ: Center of Alcohol Studies at Rutgers University; 1974.

188. Shaw S, Cartwright A, Spratley T, Harwin J. Responding to Drinking Problems: Croom Helm; 1978.

189. Giesbrecht N, Moskalewicz J. Community context and emergency room research: two solitudes or opportunities for collaboration? In: Cherpitel C, Borges G, Giesbrecht N, Hungerford D, Peden M, Poznyak V, et al., editors. Alcohol and Injuries: Emergency Department Studies in an International Perspective. Geneva: World Health Organization; 2009. p. 245-252.

190. SIRC. Social and Cultural Aspect of Drinking; A Report to the European Commission. Oxford, UK: The Social Issues Research Centre; 1998.

191. Anderson P, Clement SUE. The AAPPQ Revisited: the measurement of general practitioners' attitudes to alcohol problems. British Journal of Addiction 1987;82(7):753-759.

192. Basu D, Malhotra A, Varma VK, Malhotra R. Development of a scale to assess attitudes toward drinking and alcoholism. Indian J Psychiatry 1998;40(2):158-64.

193. Mabood N, Zhou H, Dong KA, Ali S, Wild TC, Newton AS. Attitudes and Beliefs towards Patients with Hazardous Alcohol Use: A Systematic Review. ISRN Emergency Medicine 2012;2012:10.

194. Rankin J, Schmidt W, Popham R, De Lint J. Epidemiology of alcoholic liver disease: insights and problems. In: Khanna J, editor. Alcoholic Liver Pathology, International Symposium on Alcohol and Drug Addiction Series. Ontario, Canada: Alcoholism and Drug Addiction Research Foundation of Ontario; 1975.

195. Wechsler H, Wuethrich B. Dying to Drink: Confronting Binge Drinking on College Campuses: Rodale Books; 2003.

196. Abel EL, Kruger ML, Friedl J. How Do Physicians Define “Light,”“Moderate,” and “Heavy” Drinking? Alcoholism: Clinical and Experimental Research 1998;22(5):979-984.

197. Stockwell T, Hawks D, Lang E, Rydon P. Unravelling the preventive paradox for acute alcohol problems. 1996.

198. Allsop S. Drug use and mental health : effective responses to co-occurring drug and mental health problems. East Hawthorn, Vic.: East Hawthorn, Vic. : IP Communications; 2008.

199. Gorman DM, Jacobs LM, McAlpine D. Measuring factors that influence the response of medical practitioners and social workers to problem drinkers: a pilot study. Drug and Alcohol Review 1994;13(3):269-276.

200. Aira M, Kauhanen J, Larivaara P, Rautio P. Factors influencing inquiry about patients alcohol consumption by primary health care physicians: qualitative semi-structured interview study. Family Practice 2003;20(3):270-275.

201. Danielsson PE, Rivara FP, Gentilello LM, Maier RV. Reasons why trauma surgeons fail to screen for alcohol problems. Achives of Surgery 1999;134(5):564-8.

202. Hungerford D, Pollock DA. Alcohol Problems Among Emergency Department Patients: Proceedings of a Research Conference on Identification and Intervention March 19-21 200l Arlington, VA. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2002.

203. FARE. Founation for Alcohol Research and Education: Annual Alcohol Poll: Attitudes and Behaviours 2012. Deakin West ACT: FARE; 2013.

204. Anderson P, Chisholm D, Fuhr DC. Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. The Lancet 2009;373(9682):2234-2246.

205. Babor T, Caetano R, Casswell S, al. E. Alcohol : no ordinary commodity : research and public policy. Oxford: Oxford : Oxford University Press; 2010.

206. Wagenaar AC, Salois MJ, Komro KA. Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. Addiction 2009;104(2):179-190.

207. Saffer H, Dave D, Grossman M. Behavioral Economics and the Demand for Alcohol: Results from the NLSY97: National Bureau of Economic Research; 2012.

208. White V, Faulkner A, Coomber K, Azar D, Room R, Livingston M, et al. How has alcohol advertising in traditional and online media in Australia changed? Trends in advertising expenditure 1997–2011. Drug and Alcohol Review 2015;34(5):521-530.

209. Jernigan DH. The global alcohol industry: an overview. Addiction 2009;104(s1):6-12.

210. Huckle T, Huckle T, Sweetsur P, Huckle T, Sweetsur P, Moyes S, et al. Ready to drinks are associated with heavier drinking patterns among young females. Drug and Alcohol Review 2008;27(4):398-403.

211. Casswell S. Alcohol advertising and sponsorship: Commercial freedom or control in the public interest? In: Heather N, Stockwell T, editors. The essential handbook of treatment and prevention of alcohol problems; 2004. p. 339.

212. McCreanor T, Lyons A, Griffin C, Goodwin I, Moewaka Barnes H, Hutton F. Youth drinking cultures, social networking and alcohol marketing: implications for public health. Critical Public Health 2012;23(1):110-120.

213. Carah N, Brodmerkel S, Hernandez L. Brands and sociality Alcohol branding, drinking culture and Facebook. Convergence: The International Journal of Research into New Media Technologies 2014:1354856514531531.

214. Hastings G, Anderson S, Cooke E, Gordon R. Alcohol marketing and young people's drinking: a review of the research. Journal of public health policy 2005;26(3):296-311.

215. Saffer H, Dave D. Alcohol advertising and alcohol consumption by adolescents. Health Economics 2006;15(6):617-637.

216. Austin EW, Chen M-J, Grube JW. How does alcohol advertising influence underage drinking? The role of desirability, identification and skepticism. Journal of Adolescent Health 2006;38(4):376-384.

217. Rowland B, Toumbourou J, Satyen L, Tooley G, Hall J, Livingston M, et al. Associations between alcohol outlet densities and adolescent alcohol consumption: A study in Australian students. Addictive behaviors 2014;39(1):282-288.

218. Graham K. Raising the Bar. 1. ed. Hoboken: Hoboken : Taylor and Francis; 2012.

219. Ireland CS, Thommeny JL. The crime cocktail: licensed premises, alcohol and street offences. Drug and Alcohol Review 1993;12(2):143-150.

220. Miller P, Pennay A, Droste N, Butler E, Jenkinson R, Hyder S, et al. A comparative study of blood alcohol concentrations in Australian night-time entertainment districts. Drug and Alcohol Review 2014;33(4):338-345.

221. Stockwell T, Chikritzhs T. Do relaxed trading hours for bars and clubs mean more relaxed drinking? A review of international research on the impacts of changes to permitted hours of drinking. Crime Prevention & Community Safety 2009;11(3):153-170.

222. Menendez P, Weatherburn D, Kypri K, Fitzgerald J. Lockouts and last drinks: The impact of the January 2014 liquor licence reforms on assaults in NSW, Australia. BOCSAR NSW Crime and Justice Bulletins 2015:12.

223. Miller P, Sonderlund A, Coomber K, Palmer D, Gillham K, Tindall J, et al. Do community interventions targeting licensed venues reduce alcohol-related emergency department presentations? Drug Alcohol Rev 2011;30(5):546-53.

224. Alaniz ML. Alcohol availability and targeted advertising in racial/ethnic minority communities. Alcohol health and research world 1998;22(4):286.

225. Parker RN, McCaffree KJ. Alcohol and Violence: The Nature of the Relationship and the Promise of Prevention: Lexington Books; 2013.

226. Herd D. Voices from the field: The social construction of alcohol problems in inner-city communities. Contemporary Drug Problems 2011;38(1):7-39.

227. Lam T, Lenton SR, Burns L, Aiken A, Ogeil R, Gilmore WT, et al. Alcohol policy impact on young risky drinkers and their support for proposed measures. Australian and New Zealand journal of public health 2015;39(2):129-134.

228. Graham K, Bernards S, Osgood DW, Homel R, Purcell J. Guardians and handlers: the role of bar staff in preventing and managing aggression. Addiction 2005;100(6):755-766.

229. McFadden AJ, Young M, Markham F. Venue-Level Predictors of Alcohol-Related Violence: An Exploratory Study in Melbourne, Australia. International Journal of Mental Health and Addiction 2015:1-14.

230. WHO. WHO global status report on road safety 2013: supporting a decade of action: World Health Organization; 2013.

231. Drummer OH, Gerostamoulos J, Batziris H, Chu M, Caplehorn JRM, Robertson MD, et al. The incidence of drugs in drivers killed in Australian road traffic crashes. Forensic science international 2003;134(2):154-162.

232. Watson B, Leal N, Soole D. The impact of drink driving laws. In: Miller P, editor. The impact of drink driving laws. In Miller, Peter (Ed.) Interventions for Addiction : Comprehensive Addictive Behaviors and Disorders: Academic Press (Elsevier); 2013. p. 697-707.

233. Benson BL, Rasmussen DW, Mast BD. Deterring drunk driving fatalities: an economics of crime perspective. International review of law and economics 1999;19(2):205-225.

234. Dionne G, Fluet C, Desjardins D. Predicted risk perception and risk-taking behavior: The case of impaired driving. Journal of risk and uncertainty 2007;35(3):237-264.

235. Watson B, Freeman J. Perceptions and Experiences of Random Breath Testing in Queensland and the Self-Reported Deterrent Impact on Drunk Driving. Traffic Injury Prevention 2007;8(1):11-19.

236. Runge J, Garrison H, Hall W, Waller A, Shen G. Identification and referral of impaired drivers through emergency department protocols. In: National Technical Information Service; 2002.

237. Duong DK, Rathlev NK, McGrath ME, White LF, Mitchell P. Does mandatory inpatient alcohol detoxification reduce emergency department recidivism, hospital admissions, and emergency medical services transports for patients with chronic, severe alcohol dependence? The Journal of emergency medicine 2012;43(5):883-888.

238. Whitlock EP, Polen MR, Green CA, Orleans T, Klein J. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the U.S. Preventive Services Task Force. Annals of Internal Medicine 2004;140(7):557.

239. Fahy P, Croton G, Voogt S. Embedding routine alcohol screening and brief interventions in a rural general hospital. Drug and Alcohol Review 2011;30(1):47-54.

240. Morse BA, Hutchins E. Reducing complications from alcohol use during pregnancy through screening. J Am Med Womens Assoc 2000;55(4):225-7, 240.

241. Hansen LJ, de Fine Olivarius N, Beich A, Barfod S. Encouraging GPs to undertake screening and a brief intervention in order to reduce problem drinking: a randomized controlled trial. Family Practice 1999;16(6):551-557.

242. McKnight-Eily L, Yong L, Brewer RD, Kanny D, Hua L, Denny C, et al. Vital Signs: Communication Between Health Professionals and Their Patients About Alcohol Use — 44 States and the District of Columbia, 2011. Morbidity and Mortality Weekly Report, CDC 2014;63.

243. Freeman T, Roche AM, Williamson P, Pidd K. Hazardous alcohol use interventions with emergency patients: Self-reported practices of nurses, and predictors of behaviour. Emergency Medicine Australasia 2011;23(4):479-489.

244. Graham DM, Maio RF, Blow FC, Hill EM. Emergency Physician Attitudes Concerning Intervention for Alcohol Abuse/Dependence Delivered in the Emergency Department. Journal of Addictive Diseases 2000;19(1):45-53.

245. D'Onofrio G, Pantalon M, Degutis LC, Fiellin D, O'Connor P. Appendix A: The Yale Brief Negotiated Interview Manual. In: Medicine YUE, editor. Project ED Health II: BNI Training Manual. New Haven, CT; 2005.

246. Robinson D. The alcohologist's addiction. Some implications of having lost control over the disease concept of alcoholism. Quarterly Journal of Studies on Alcohol 1972;33(4):1028-1042.

247. Fisher JC, Keeley KA, Mason RL, Fisher JV. Physicians and alcoholics. Factors affecting attitudes of family-practice residents toward alcoholics. Journal of studies on alcohol 1975;36(5):626-633.

248. Armor DJ, Polich JM, Stanbul HB. Alcoholism and Treatment, Prepared for the US National Institute on Alcohol Abuse and Alcoholism. Santa Monica, CA: Rand Corp; 1976.

249. Emrick CD. A review of psychologically oriented treatment of alcoholism: the relative effectiveness of different treatment approaches and the effectiveness of treatment versus no treatment. Journal of Studies on Alcohol 1975;36(1).

250. Miller WR, Wilbourne PL. Mesa Grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. Society for the Study of Addiction to Alcohol and other Drugs 2002;97:265-277.

251. Anderson P, Kaner E, Wutzke S, Wensing M, Grol R, Heather N, et al. Attitudes and management of alcohol problems in general practice: descriptive analysis based on findings of a world health organization international collaborative survey. Alcohol and Alcoholism 2003;38(6):597-601.

252. Cartwright AKJ, Gorman DM. Processes Involved in Changing the Therapeutic Attitudes of Clinicians Toward Working with Drinking Clients. Psychotherapy Research 1993;3(2):95-104.

253. Moyers TB, Miller WR. Is low therapist empathy toxic? Psychology of Addictive Behaviors 2013;27(3):878-884.

254. Elliott R, Bohart AC, Watson JC, Greenberg LS. Empathy. Psychotherapy (Chic) 2011;48(1):43-9.

255. Grimshaw JM, Eccles MP, Walker AE, Thomas RE. Changing physicians' behavior: What works and thoughts on getting more things to work. Journal of Continuing Education in the Health Professions 2002;22(4):237-243.

256. Bernstein E, Topp D, Shaw E, Girard C, Pressman K, Woolcock E, et al. A Preliminary Report of Knowledge Translation: Lessons From Taking Screening and Brief Intervention Techniques From the Research Setting Into Regional Systems of Care. Academic Emergency Medicine 2009;16(11):1225-1233.

257. D'Onofrio G, Nadel ES, Degutis LC, Sullivan LM, Casper K, Bernstein E, et al. Improving emergency medicine residents' approach to patients with alcohol problems: a controlled educational trial. Annals of Emergency Medicine 2002;40(1):50-62.

258. Babor T, Higgins-Biddle JC, Higgins PS, Gassman RA, Gould BE. Training Medical Providers to Conduct Alcohol Screening and Brief Interventions. Substance Abuse 2004;25(1):17-26.

259. Proude EM, Conigrave KM, Haber PS. Effectiveness of skills-based training using the Drink-less package to increase family practitioner confidence in intervening for alcohol use disorders. BMC medical education 2006;6:8.

260. Proude EM, Conigrave KM, Britton A, Haber PS. Improving alcohol and tobacco history taking by junior medical officers. Alcohol Alcohol. 2008;43(3):320-325.

261. Godin G, Belanger-Gravel A, Eccles M, Grimshaw J. Healthcare professionals' intentions and behaviours: A systematic review of studies based on social cognitive theories. Implementation Science 2008;3:36.

262. NIAAA. Final Recommendations of the NIAAA Extramural Advisory Board: Alcohol Health Services Research; 2007 Sept. 18-19, 2007.

263. Aarons GA. Measuring provider attitudes toward evidence-based practice: consideration of organizational context and individual differences. Child Adolesc Psychiatr Clin N Am 2005;14(2):255-71, viii.

264. Jelinek GA, Weiland TJ, Mackinlay C, Gerdtz M, Hill N. Knowledge and confidence of Australian emergency department clinicians in managing patients with mental health-related presentations: findings from a national qualitative study. Int J Emerg Med 2013;6(1):2.

265. Deluca P, Drummond C, Coulton S, Perryman K, Bland M, Cassidy P, et al. Challenges and solutions in implementing screening and brief interventions for hazardous alcohol use in accident and emergency departments. In: Alcoholism: Clinical and Experimental Research; 2010. p. 294a.

266. Flynn PM, Simpson DD. Chapter twenty-two - Adoption and Implementation of Evidence-Based Treatment. In: Miller PM, editor. Evidence-Based Addiction Treatment. San Diego: Academic Press; 2009. p. 419-437.

267. Garner BR. Research on the diffusion of evidence-based treatments within substance abuse treatment: A systematic review. Journal of Substance Abuse Treatment 2009;36(4):376-399.

268. Miller P. Chapter twenty-three - Challenges of an Evidence-Based Approach to Addiction Treatment. In: Miller PM, editor. Evidence-Based Addiction Treatment. San Diego: Academic Press; 2009. p. 439-448.

269. Sorensen JL, Hettema JE, Larios S. Chapter one - What Is Evidence-Based Treatment? In: Miller PM, editor. Evidence-Based Addiction Treatment. San Diego: Academic Press; 2009. p. 1-20.

270. Allsop S, Stevens CF. Evidence-based practice or imperfect seduction? Developing capacity to respond effectively to drug-related problems. Drug and Alcohol Review 2009;28(5):541-549.

271. Drake RE, H. G, Leff HS, Lehman AF, Dixon L, Mueser KT, et al. Implementing evidence-based practices in routine mental health service settings. Psychiatric Services 2001;52(2):179-182.

272. IoM. Broadening the base of treatment for alcohol problems: report of a study by a committee of the Institute of Medicine, Division of Mental Health and Behavioral Medicine: National Institute on Alcohol Abuse Alcoholism: National Academy Press; 1990.

273. D'Aunno T. The role of organization and management in substance abuse treatment: Review and roadmap. Journal of Substance Abuse Treatment 2006;31(3):221-233.

274. Rieckmann T, Abraham A, Zwick J, Rasplica C, McCarty D. A Longitudinal Study of State Strategies and Policies to Accelerate Evidence-Based Practices in the Context of Systems Transformation. Health Services Research 2015;50(4):1125-1145.

275. Babor T, Higgins-Biddle JC. Alcohol screening and brief intervention: dissemination strategies for medical practice and public health. Addiction 2000;95(5):677-686.

276. Berner MM, Kriston L, Bentele M, Harter M. The alcohol use disorders identification test for detecting at-risk drinking: a systematic review and meta-analysis *.(Report). Journal of Studies on Alcohol and Drugs 2007;68(3):461.

277. Soderstrom CA, Smith GS, Kufera JA, Dischinger PC, Hebel JR, McDuff DR, et al. The accuracy of the CAGE, the Brief Michigan Alcoholism Screening Test, and the Alcohol Use Disorders Identification Test in screening trauma center patients for alcoholism. In: The Journal of trauma; 1997. p. 962-9.

278. Schlesinger C, Saunders JB, Proude EM. Australia. In: Heather N, editor. WHO Collaborative Project on Identification and Management of Alcohol-Related problems in primary health care: report on phase 1V: development of country-wide strategies for implementing early identification and brief intervention in primary health care. Geneva: WHO; 2006.

279. Bray JW, Cowell AJ, Hinde JM. A systematic review and meta-analysis of health care utilization outcomes in alcohol screening and brief intervention trials. Med Care 2011;49(3):287-94.

280. Heather N. Can screening and brief intervention lead to population-level reductions in alcohol-related harm? Addict Sci Clin Pract 2012;7(1):15.

281. Gentilello LM, Ebel B, Wickizer T, Salkever D, Rivara F. Alcohol interventions for trauma patients treated in emergency departments and hospitals: a cost benefit analysis. Annals of Surgery April 2005;241(4):541-550.

282. Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL. Brief Physician Advice for Problem Drinkers: Long-Term Efficacy and Benefit-Cost Analysis. Alcoholism: Clinical and Experimental Research 2002;26(1):36-43.

283. Havard A, Shakeshaft AP, Conigrave KM, Doran CM. Randomized controlled trial of mailed personalized feedback for problem drinkers in the emergency department: the short-term impact. Alcohol Clin Exp Res 2012;36(3):523-31.

284. Blow FC, Barry KL, Walton MA, Maio RF, Chermack ST, Bingham CR, et al. The efficacy of two brief intervention strategies among injured, at-risk drinkers in the emergency department: impact of tailored messaging and brief advice. J Stud Alcohol 2006;67(4):568-78.

285. Young MM, Stevens A, Porath-Waller A, Pirie T, Garritty C, Skidmore B, et al. Effectiveness of brief interventions as part of the screening, brief intervention and referral to treatment (SBIRT) model for reducing the non-medical use of psychoactive substances: a systematic review protocol. Syst Rev 2012;1:22.

286. Beich A, Gannik D, Malterud K. Screening and brief intervention for excessive alcohol use: qualitative interview study of the experiences of general practitioners. BMJ 2002;325(7369):870.

287. Bertholet N, Daeppen J-B, Wietlisbach V, Fleming M, Burnand B. Reduction of alcohol consumption by brief alcohol intervention in primary care: systematic review and meta-analysis. Archives of internal medicine 2005;165(9):986.

288. Kaner E, Bland M, Cassidy P, Coulton S, Deluca P, Drummond C, et al. Screening and brief interventions for hazardous and harmful alcohol use in primary care: a cluster randomised controlled trial protocol. BMC Public Health 2009;9:287.

289. Field CA, Baird J, Saitz R, Caetano R, Monti PM. The Mixed Evidence for Brief Intervention in Emergency Departments, Trauma Care Centers, and Inpatient Hospital Settings: What Should We Do? Alcoholism: Clinical and Experimental Research 2010;34(12):2004-2010.

290. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. Drug Alcohol Depend 2009;99(1-3):280-95.

291. Humeniuk R, Ali R, Babor T, Souza-Formigoni ML, de Lacerda RB, Ling W, et al. A randomized controlled trial of a brief intervention for illicit drugs linked to the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) in clients recruited from primary health-care settings in four countries. Addiction 2012;107(5):957-66.

292. Rubinsky AD, Sun H, Blough DK, Maynard C, Bryson CL, Harris AH, et al. AUDIT-C Alcohol Screening Results and Postoperative Inpatient Health Care Use. Journal of the American College of Surgeons 2012;214(3):296-305.e1.

293. Spies CD, von Dossow V, Eggers V, Jetschmann G, El-Hilali R, Egert J, et al. Altered cell-mediated immunity and increased postoperative infection rate in long-term alcoholic patients. Anesthesiology 2004;100(5):1088.

294. Bradley KA, Rubinsky AD, Sun H, Blough DK, Tønnesen H, Hughes G, et al. Prevalence of alcohol misuse among men and women undergoing major noncardiac surgery in the Veterans Affairs health care system. Surgery 2012;152(1):69-81.

295. Maciosek MV, Coffield AB, Edwards NM, Flottemesch TJ, Goodman MJ, Solberg LI. Priorities Among Effective Clinical Preventive Services: Results of a Systematic Review and Analysis. American Journal of Preventive Medicine 2006;31(1):52-61.

296. Dauer AR-M, Rubio ES, Coris ME, Valls JM. Brief intervention in alcohol-positive traffic casualties: is it worth the effort? Alcohol and Alcoholism 2006;41(1):76-83.

297. Williams S, Brown A, Patton R, Crawford MJ, Touquet R. The half-life of the 'teachable moment' for alcohol misusing patients in the emergency department. Drug Alcohol Depend 2005;77(2):205-8.

298. O'Donnell A, Anderson P, Newbury-Birch D, Schulte B, Schmidt C, Reimer J, et al. The Impact of Brief Alcohol Interventions in Primary Healthcare: A Systematic Review of Reviews. Alcohol and Alcoholism 2014;49(1):66-78.

299. EMCDDA. Emergency department-based brief interventions for individuals with substance-related problems: a review of effectiveness. Luxembourg : Publications Office of the European Union; 2016.

300. Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. Addiction 2002;97(3):279-292.

301. Hansen AB, Becker U, Nielsen AS, Grønbæk M, Tolstrup JS. Brief Alcohol Intervention by Newly Trained Workers Versus Leaflets: Comparison of Effect in Older Heavy Drinkers Identified in a Population Health Examination Survey: A Randomized Controlled Trial. Alcohol and Alcoholism 2012;47(1):25-32.

302. Bombardier CH, Rimmele CT. Alcohol use and readiness to change after spinal cord injury. Arch Phys Med Rehabil 1998;79(9):1110-5.

303. Stein LAR, Minugh PA, Longabaugh R, Wirtz P, Baird J, Nirenberg TD, et al. Readiness to Change as a Mediator of the Effect of a Brief Motivational Intervention on Posttreatment Alcohol-Related Consequences of Injured Emergency Department Hazardous Drinkers. Psychology of Addictive Behaviors 2009;23(2):185-195.

304. Barnett NP, Apodaca T, M. M, Colby SM, Gwaltney C, Rohsenow DJ, et al. Moderators and mediators of two brief interventions for alcohol in the emergency department. Addiction 2010;10(5):452-465.

305. Saitz R, Svikis D, D'Onofrio G, Kraemer KL, Perl H. Challenges Applying Alcohol Brief Intervention in Diverse Practice Settings: Populations, Outcomes, and Costs. Alcoholism: Clinical and Experimental Research 2006;30(2):332-338.

306. Bernstein E, Bernstein J. Effectiveness of Alcohol Screening and Brief Motivational Intervention in the Emergency Department Setting. Annals of Emergency Medicine 2008;51(6):751-754.

307. D'Onofrio G, Pantalon MV, Degutis LC, Fiellin DA, Busch SH, Chawarski MC, et al. Brief Intervention for Hazardous and Harmful Drinkers in the Emergency Department. Annals of Emergency Medicine 2008;51(6):742-750.e2.

308. McQueen J, Howe TE, Allan L, Mains D, Hardy V. Brief interventions for heavy alcohol users admitted to general hospital wards. Cochrane Database Syst Rev 2011(8):CD005191.

309. Pantalon MV, Martino S, Dziura J, Li F-Y, Owens PH, Fiellin DA, et al. Development of a scale to measure practitioner adherence to a brief intervention in the emergency department. Journal of Substance Abuse Treatment 2012;43(4):382-388.

310. Dill P, Wells-parker E, Soderstrom C. The Emergency Care Setting for Screening and Intervention for Alcohol Use Problems Among Injured and High-Risk Drivers: A Review. Traffic Injury Prevention 2004;5(3):278-291.

311. Naimi TS, Cole TB. Electronic alcohol screening and brief interventions: Expectations and reality. JAMA 2014;311(12):1207-1209.

312. Kypri K, Vater T, Bowe SJ, et al. Web-based alcohol screening and brief intervention for university students: A randomized trial. JAMA 2014;311(12):1218-1224.

313. Ali R, Humeniuk R, Newcombe D. Preliminary findings of the WHO ASSIST phase III study in an Australian setting: a five-minute brief intervention for ilicit drug linked to assist scores. In: 68th Annual Scientific Meeting of the College on Problems of Drug Dependence; 2006 Jun 17-22; 2006.

314. Wade D, Varker T, Forbes D, O'Donnell M. The Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) in the Assessment of Alcohol Use Disorders Among Acute Injury Patients. Alcohol Clin Exp Res 2013.

315. Chen HY, Senserrick T, Martiniuk ALC, Ivers RQ, Boufous S, Chang HY, et al. Fatal crash trends for Australian young drivers 1997-2007: Geographic and socioeconomic differentials. Journal of Safety Research 2010;41(2):123-128.

316. Petrie DJ, Doran CM, Shakeshaft AP, Sanson-Fisher R. The relationship between risky alcohol consumption, crime and traffic accidents in Australian rural communities. Addictive Behaviors 2010;35(4):359-362.

317. Sivakumar S, Weiland TJ, Gerdtz MF, Knott J, Jelinek GA. Mental health-related learning needs of clinicians working in Australian emergency departments: a national survey of self-reported confidence and knowledge. Emerg Med Australas 2011;23(6):697-711.

318. Gerdtz MF, Weiland TJ, Jelinek GA, Mackinlay C, Hill N. Perspectives of emergency department staff on the triage of mental health-related presentations: Implications for education, policy and practice. Emerg Med Australas 2012;24(5):492-500.

319. Weiland TJ, Dent A, Phillips GA, Lee NK. Emergency clinician-delivered screening and intervention for high-risk alcohol use: A qualitative analysis. Emergency Medicine Australasia 2008;20(2):129-135.

320. Azar D, White V, Bland S, Livingston M, Room R, Chikritzhs T, et al. 'Something's Brewing': The Changing Trends in Alcohol Coverage in Australian Newspapers 2000–2011; 2014.

321. Chappel JN, Schnoll SH. Physician attitudes. Effect on the treatment of chemically dependent patients. Jama 1977;237(21):2318-9.

322. Meissen GJ, Mason WC, Gleason DF. Understanding the Attitudes and Intentions of Future Professionals Toward Self-Help. American Journal of Community Psychology 1991;19(5):699-714.

323. Mogar RE, Helm ST, Snedeker MR, Snedeker MH, Wilson WM. Staff attitudes toward the alcoholic patient. Arch Gen Psychiatry 1969;21(4):449-54.

324. Moodley-Kunnie T. Attitudes and Perceptions of Health Professionals Toward Substance Use Disorders and Substance-Dependent Individuals. Substance Use & Misuse 1988;23(5):469-475.

325. Watson H, Maclaren W, Shaw F, Nolan A. Measuring staff attitudes to people with drug problems:

The development of a tool. In: Trust GCUGGPCN, editor. Effective Interventions Unit. Drug Misuse Research Programme; 2003.

326. Miller WR, Rollnick S. Motivational Interviewing, Third Edition: Helping People Change: Guilford Press; 2012.

327. Chafetz ME, Blane HT, Abram HS, Golner J, Lacy E, Mc CW, et al. Establishing treatment relations with alcoholics. J Nerv Ment Dis 1962;134:395-409.

328. Cooke M, Mattick RP, Campbell E. The influence of individual and organizational factors on the reported smoking intervention practices of staff in 20 antenatal clinics. Drug and Alcohol Review 1998;17(2):175-175.

329. Stavrou A, Challoumas D, Dimitrakakis G. Archibald Cochrane (1909–1988): the father of evidence-based medicine. Interactive CardioVascular and Thoracic Surgery 2014;18(1):121-124.

330. Cochrane AL. Effectiveness and efficiency: random reflections on health services. 1973.

331. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. BMJ : British Medical Journal 1996;312(7023):71-72.

332. CASA. Addiction Medicine: Closing the Gap between Science and Practice. In: University NCoAaSAaC, editor. New York; 2012.

333. Friedmann PD, McCullough D, Chin MH, Saitz R. Screening and Intervention for Alcohol Problems. Journal of General Internal Medicine 2000;15(2):84-91.

334. Anderson P, Laurant M, Kaner E, Wensing M, Grol R. Engaging general practitioners in the management of hazardous and harmful alcohol consumption: results of a meta-analysis. Journal of Studies on Alcohol 2004;65(2):191.

335. Nordqvist C, Johansson K, Lindqvist K, Bendtsen P. Alcohol prevention measures at an emergency department: physicians' perspectives. Public Health 2005;119(9):789-791.

336. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. Psychological review 1977;84(2):191.

337. Parish CL, Pereyra MR, Pollack HA, Cardenas G, Castellon PC, Abel SN, et al. Screening for substance misuse in the dental care setting: findings from a nationally representative survey of dentists. Addiction 2015.

338. Geller G, Levine DM, Mamon JA, Moore RD, Bone LR, Stokes EJ. Knowledge, attitudes, and reported practices of medical students and house staff regarding the diagnosis and treatment of alcoholism. JAMA 1989;261(21):3115-20.

339. MacLeod JBA, Hungerford DW, Dunn C, Hartzler B. Evaluation of Training of Surgery Interns to Perform Brief Alcohol Interventions for Trauma Patients. Journal of the American College of Surgeons 2008;207(5):639-645.

340. Force UPST. Screening and Behavioral Counseling Interventions in Primary Care To Reduce Alcohol Misuse: Recommendation Statement. Annals of Internal Medicine 2004;140(7):554-6.

341. Williams EC, Johnson ML, Lapham GT, Caldeiro RM, Chew L, Fletcher GS, et al. Strategies to Implement Alcohol Screening and Brief Intervention in Primary Care Settings. Psychology of Addictive Behaviors 2011;25(2):206-214.

342. Room R, Rehm J, Trotter RT, Paglia A, Üstün TB. Cross-cultural views on stigma, valuation, parity and societal values towards disability. Disability and culture: universalism and diversity. Seattle, WA, Hogrefe & Huber 2001:247-291.

343. Lloyd C. The stigmatization of problem drug users: A narrative literature review. Drugs: education, prevention and policy 2013;20(2):85-95.

344. Miller NS, Sheppard LM, Colenda CC, Magen J. Why Physicians Are Unprepared to Treat Patients Who Have Alcohol- and Drug-related Disorders. Academic Medicine 2001;76(5):410-418.

345. Fisher JC, Mason RL, Keeley KA, Fisher JV. Physicians and alcoholics. The effect of medical training on attitudes toward alcoholics. Journal of studies on alcohol 1975;36(7):949.

346. Richter L, Foster SE. Effectively addressing addiction requires changing the language of addiction. Journal of public health policy 2014;35(1):60-64.

347. Chahine J. Social workers' perceptions of individuals who use drugs and alcohol problematically: CALIFORNIA STATE UNIVERSITY, LONG BEACH; 2013.

348. Wyatt S, Wilford B. Medical Student and Physician Education in Substance Use Disorders. In: Verster JC, Brady K, Galanter M, Conrod P, editors. Drug Abuse and Addiction in Medical Illness: Springer New York; 2012. p. 531-544.

349. van Boekel LC, Brouwers EP, van Weeghel J, Garretsen HF. Stigma among health professionals towards patients with substance use disorders and its consequences for healthcare delivery: systematic review. Drug Alcohol Depend 2013;131(1-2):23-35.

350. Palmer RS, Murphy MK, Piselli A, Ball SA. Substance user treatment dropout from client and clinician perspectives: A pilot study. Substance use & misuse 2009;44(7):1021-1038.

351. Broyles LM, Binswanger IA, Jenkins JA, Finnell DS, Faseru B, Cavaiola A, et al. Confronting inadvertent stigma and pejorative language in addiction scholarship: A recognition and response. Substance Abuse 2014;35(3):217-221.

352. Kelly JF, Westerhoff CM. Does it matter how we refer to individuals with substance-related conditions? A randomized study of two commonly used terms. International Journal of Drug Policy 2010;21(3):202-207.

353. Kelly JF, Wakeman SE, Saitz R. Stop Talking 'Dirty': Clinicians, Language, and Quality of Care for the Leading Cause of Preventable Death in the United States. The American Journal of Medicine 2015;128(1):8-9.

354. Ram A, Chisolm M. The Time is Now: Improving Substance Abuse Training in Medical Schools. Academic Psychiatry 2015;40(3):454-60.

355. van Boekel LC, Brouwers EP, van Weeghel J, Garretsen HF. Healthcare professionals' regard towards working with patients with substance use disorders: comparison of primary care, general psychiatry and specialist addiction services. Drug Alcohol Depend 2014;134:92-8.

356. Leake GJ, King AS. Effect of counselor expectations on alcoholic recovery. Alcohol Health & Research World 1977.

357. Kerlinger F. Problems and hypotheses: in In: Foundations of Behavioral Research. 3rd ed. Orlando, FL: Harcourt Brace& Company; 1986. p. 15-25.

358. Glanz K, Rimer B, Lewis F. Health Behavior and Health Education: Theory, Research and Practice. San Francisco, CA: John Wiley & Sons; 2002.

359. Hardeman W, Johnston M, Johnston D, Bonetti D, Wareham N, Kinmonth AL. Application of the Theory of Planned Behaviour in Behaviour Change Interventions: A Systematic Review. Psychology & Health 2002;17(2):123-158.

360. French SD, Green SE, O'Connor DA, McKenzie JE, Francis J, Michie S, et al. Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. Implement Sci 2012;7:38.

361. Perkins MB, Jensen PS, Jaccard J, Gollwitzer P, Oettingen G, Pappadopulos E, et al. Applying theory-driven approaches to understanding and modifying clinicians' behavior: what do we know? Psychiatr Serv 2007;58(3):342-8.

362. Hakkennes S, Green S. Measures for assessing practice change in medical practitioners. Implementation Science 2006;1(1):29.

363. Rhodes KV, Pollock DA. The future of emergency medicine public health research. Emergency medicine clinics of North America 2006;24(4):1053-1073.

364. Bernstein S, D'Onofrio G. Public Health in the Emergency Department: Academic Emergency Medicine Consensus Conference Executive Summary. Academic Emergency Medicine 2009;16(11):1037-1039.

365. McKay MP, Vaca FE, Field C, Rhodes K. Public Health in the Emergency Department: Overcoming Barriers to Implementation and Dissemination. Academic Emergency Medicine 2009;16(11):1132-1137.

366. Eccles M, Grimshaw JM, Walker A, Johnston M, Pitts N. Changing the behavior of healthcare professionals: the use of theory in promoting the uptake of research findings. Journal of Clinical Epidemiology 2005;58(2):107-112.

367. Allsop S, Helfgott S. Whither the drug specialist? The work-force development needs of drug specialist staff and agencies. Drug and Alcohol Review 2002;21(3):215-222.

368. Ferlie EB, Shortell SM. Improving the Quality of Health Care in the United Kingdom and the United States: A Framework for Change. Milbank Quarterly 2001;79(2):281-315.

369. Milne S, Orbell S, Sheeran P. Combining motivational and volitional interventions to promote exercise participation: Protection motivation theory and implementation intentions. British journal of health psychology 2002;7(2):163-184.

370. Rogers EM. Diffusion of preventive innovations. Addict Behav 2002;27(6):989-93.

371. Sanson-Fisher RW. Diffusion of innovation theory for clinical change. Medical Journal of Australia 2004;180(6 Suppl):S55-6.

372. Israel BA, Checkoway B, Schulz A, Zimmerman M. Health education and community empowerment: conceptualizing and measuring perceptions of individual, organizational, and community control. Health Education & Behavior 1994;21(2):149-170.

373. Steckler A, Goodman RM, Kegler M. Mobilizing organizations for health enhancement: Theories of organizational change. In: Glanz K, Rimer B, Lewis F, editors. Health Behavior and Health Education: Theory, Research and Practice. San Francisco, CA: John Wiley & Sons; 2002. p. 335-300.

374. Eccles M, Grimshaw J, MacLennan G, Bonetti D, Glidewell L, Pitts N, et al. Explaining clinical behaviors using multiple theoretical models. Implementation Science 2012;7(1):99.

375. Ajzen I. Factors Influencing Intentions and the Intention-Behavior Relation. Human Relations 1974;27(1):1-15.

376. Ajzen I. The theory of planned behaviour. Organ Behav Hum Decis Processes 1991;2(50):179 - 211.

377. Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. Medical Journal of Australia 2004;180(6 Suppl):S57-60.

378. Noar SM, Zimmerman RS. Health Behavior Theory and cumulative knowledge regarding health behaviors: are we moving in the right direction? Health Education Research 2005;20(3):275-290.

379. Gurses AP, Marsteller JA, Ozok AA, Xiao Y, Owens S, Pronovost PJ. Using an interdisciplinary approach to identify factors that affect clinicians' compliance with evidence-based guidelines. Critical Care Medicine 2010;38:S282-S291 10.1097/CCM.0b013e3181e69e02.

380. Cabana MD, Rand CS, Powe NR, Wu AW, Wilson MH, Abboud P-AC, et al. Why don't physicians follow clinical practice guidelines?: A framework for improvement. Jama 1999;282(15):1458-1465.

381. Grimshaw JM, Eccles MP. Is evidence-based implementation of evidence-based care possible? Medical Journal of Australia 2004;180(6 Suppl):S50-1.

382. Huijg JM, Gebhardt WA, Dusseldorp E, Verheijden MW, van der Zouwe N, Middelkoop BJC, et al. Measuring determinants of implementation behavior: psychometric properties of a questionnaire based on the theoretical domains framework. Implementation Science 2014;9:15.

383. Grimshaw JM, Shirran L, Thomas R, Mowatt G, Fraser C, Bero L, et al. Changing provider behavior: an overview of systematic reviews of interventions. Med Care 2001;39(8 Suppl 2):II2-45.

384. Bhattacharyya O, Reeves S, Zwarenstein M. What Is Implementation Research? Rationale, Concepts, and Practices. Research on Social Work Practice 2009;19(5):491-502.

385. Foy R, Eccles M, Grimshaw J. Why does primary care need more implementation research? Family Practice 2001;18(4):353-355.

386. Kortteisto T, Kaila M, Komulainen J, Mantyranta T, Rissanen P. Healthcare professionals' intentions to use clinical guidelines: a survey using the theory of planned behaviour. Implementation Science 2010;5(1):51.

387. Limbert C, Lamb R. Doctors' use of clinical guidelines: Two applications of the Theory of Planned Behaviour. Psychology, Health & Medicine 2002;7(3):301-310.

388. Gielen AC, Sleet D. Application of Behavior-Change Theories and Methods to Injury Prevention. Epidemiologic Reviews 2003;25(1):65-76.

389. Gorman DM. A theory-driven approach to the evaluation of professional training in alcohol abuse. Addiction 1993;88(2):229-236.

390. Eccles MP, Hrisos S, Francis J, Kaner E, Dickinson HO, Beyer F, et al. Do self- reported intentions predict clinicians' behaviour: a systematic review. Implement Sci 2006;1:28.

391. Vederhus J-K, Zemore S, Rise J, Clausen T, Hoie M. Predicting patient post-detoxification engagement in 12-step groups with an extended version of the theory of planned behavior. Addiction Science & Clinical Practice 2015;10(1):15.

392. Godin G, Kok G. The theory of planned behavior: a review of its applications to health-related behaviors. Am J Health Promot 1996;11(2):87-98.

393. McEachan RRC, Conner M, Taylor NJ, Lawton RJ. Prospective prediction of health-related behaviours with the Theory of Planned Behaviour: a meta-analysis. Health Psychology Review 2011;5(2):97-144.

394. Ajzen I. Constructing a TPB questionnaire: Conceptual and methodological considerations. Retrieved August 8, 2014. In; 2002.

395. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. Quality and Safety in Health Care 2005;14(1):26.

396. Foy R, Ovretveit J, Shekelle PG, Pronovost PJ, Taylor SL, Dy S, et al. The role of theory in research to develop and evaluate the implementation of patient safety practices. Bmj Quality & Safety 2011;20(5):453-459.

397. Graham R, Mancher M, Wolman DM, Greenfield S, Steinberg E. Clinical Practice Guidelines We Can Trust: Institutes of Medicine: The National Academies Press; 2011.

398. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. Lancet 2003;362(9391):1225-30.

399. Nigg CR, Allegrante JP, Ory M. Theory-comparison and multiple-behavior research: common themes advancing health behavior research. Health Education Research 2002;17(5):670-679.

400. Davies P, Walker AE, Grimshaw JM. A systematic review of the use of theory in the design of guideline dissemination and implementation strategies and interpretation of the results of rigorous evaluations. Implement Sci 2010;5:14.

401. Darnell D, Dunn C, Atkins D, Ingraham L, Zatzick D. A Randomized Evaluation of Motivational Interviewing Training for Mandated Implementation of Alcohol Screening and Brief Intervention in Trauma Centers. Journal of Substance Abuse Treatment 2016;60:36-44.

402. Gaume J, Magill M, Longabaugh R, Bertholet N, Gmel G, Daeppen JB. Influence of counselor characteristics and behaviors on the efficacy of a brief motivational intervention for heavy drinking in young men—A randomized controlled trial. Alcoholism: Clinical and Experimental Research 2014;38(7):2138-2147.

403. Ajzen I. The theory of planned behaviour: Reactions and reflections. Psychology & Health 2011;26(9):1113-1127.

404. Francis J, Eccles MP, Johnston M, Whitty P, Grimshaw JM, Kaner EF, et al. Explaining the effects of an intervention designed to promote evidence-based diabetes care: a theory-based process evaluation of a pragmatic cluster randomised controlled trial. Implement Sci 2008;3:50.

405. Armitage CJ, Conner M. Efficacy of the Theory of Planned Behaviour: A meta-analytic review. British Journal of Social Psychology 2001;40(4):471-499.

406. Sheeran P, Norman P, Orbell S. Evidence that intentions based on attitudes better predict behaviour than intentions based on subjective norms. European Journal of Social Psychology 1999;29(2-3):403-406.

407. Sniehotta FF. Towards a theory of intentional behaviour change: Plans, planning, and self-regulation. British Journal of Health Psychology 2009;14(2):261-273.

408. Conner M, Norman P. Predicting health behaviour: McGraw-Hill Education (UK); 2005.

409. Montano DE, Kasprzyk D. The theory of reasoned action and the theory of planned behavior. In: Health Behavior and Health Education. San Francisco, CA: Jossey-Bass Publishers, Inc.; 2002.

410. Francis J, Eccles MP, Johnston M, Walker A, Grimshaw J, Foy R, et al. Constructing questionnaires based on the theory of planned behaviour: a manual for health services researchers. In. University of Newcastle, United Kingdom; 2004.

411. Trafimow D, Finlay KA. The Importance of Subjective Norms for a Minority of People: between Subjects and within-Subjects Analyses. Personality and Social Psychology Bulletin 1996;22(8):820-828.

412. Hagger MS, Chatzisarantis NL, Biddle SJ. The influence of autonomous and controlling motives on physical activity intentions within the Theory of Planned Behaviour. British journal of health psychology 2002;7(3):283-298.

413. Ybarra O, Trafimow D. How priming the private self or collective self affects the relative weights of attitudes and subjective norms. 1998.

414. Ajzen I, Madden TJ. Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. Journal of experimental social psychology 1986;22(5):453-474.

415. Madden TJ, Ellen PS, Ajzen I. A comparison of the theory of planned behavior and the theory of reasoned action. Personality and social psychology Bulletin 1992;18(1):3-9.

416. Bandura A. Self-efficacy mechanism in human agency. American psychologist 1982;37(2):122.

417. Povey R, Conner M, Sparks P, James R, Shepherd R. Application of the Theory of Planned Behaviour to two dietary behaviours: Roles of perceived control and self-efficacy. British Journal of Health Psychology 2000;5(2):121-139.

418. Tavousi M, Hidarnia A, Montezari A. Are perceived behavioral control and self efficacy distinct constructs? European Journal of Scientific Research 2009;30(1):146 - 52.

419. Rhodes RE, Courneya KS. Self-efficacy, controllability and intention in the theory of planned behavior: measurement redundancy or causal independence? Psychology & Health 2003;18(1):79-91.

420. Kraft P, Rise J, Sutton S, Røysamb E. Perceived difficulty in the theory of planned behaviour: Perceived behavioural control or affective attitude? British Journal of Social Psychology 2005;44(3):479-496.

421. Manstead ASR, van Eekelen SAM. Distinguishing Between Perceived Behavioral Control and Self-Efficacy in the Domain of Academic Achievement Intentions and Behaviors. Journal of Applied Social Psychology 1998;28(15):1375-1392.

422. Ajzen I. Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior1. Journal of Applied Social Psychology 2002;32(4):665-683.

423. Yzer M. Perceived Behavioral Control in Reasoned Action Theory: A Dual-Aspect Interpretation. The ANNALS of the American Academy of Political and Social Science 2012;640(1):101-117.

424. Trafimow D, Sheeran P, Conner M, Finlay KA. Evidence that perceived behavioural control is a multidimensional construct: Perceived control and perceived difficulty. The British Journal of Social Psychology 2002;41:101-21.

425. Freeman T. The Role of Health Professionals in the Prevention of Smoking- and Alcohol-Related Harms: Application of the Theory of Planned Behaviour to Work Behaviours: Flinders University; 2007.

426. Fishbein M, Ajzen I. Predicting and Changing Behavior: The Reasoned Action Approach: Taylor & Francis Group; 2010.

427. Loughran H, Hohman M, Finnegan D. Predictors of Role Legitimacy and Role Adequacy of Social Workers Working with Substance-Using Clients. British Journal of Social Work 2010;40(1):239.

428. Sheeran P. Intention—Behavior Relations: A Conceptual and Empirical Review. European Review of Social Psychology 2002;12(1):1-36.

429. Trafimow D, Triandis HC, Goto SG. Some Tests of the Distinction Between the Private Self and the Collective Self. Journal of Personality and Social Psychology 1991;60(5):649-655.

430. Ajzen I, Fishbein M. Understanding attitudes and predicting social behavior. Englewood Cliffs, N.J.: Prentice-Hall; 1980.

431. Triandis HC. Values, attitudes, and interpersonal behavior. In: Nebraska symposium on motivation; 1979: University of Nebraska Press; 1979.

432. Gollwitzer PM. Implementation intentions: strong effects of simple plans. American psychologist 1999;54(7):493.

433. Gollwitzer PM, Sheeran P. Implementation Intentions and Goal Achievement: A Meta-analysis of Effects and Processes. In: Advances in Experimental Social Psychology: Academic Press; 2006. p. 69-119.

434. Sheeran P, Trafimow D, Finlay KA, Norman P. Evidence that the type of person affects the strength of the perceived behavioural control-intention relationship. The British Journal of Social Psychology 2002;41:253-70.

435. Hukkelberg SS, Hagtvet KA, Kovac VB. Latent interaction effects in the theory of planned behaviour applied to quitting smoking. British Journal of Health Psychology 2014;19(1):83-100.

436. Conner M, McMillan B. Interaction effects in the theory of planned behaviour: Studying cannabis use. British journal of social psychology 1999;38:195-222.

437. Terry DJ, O'Leary JE. The theory of planned behaviour: The effects of perceived behavioural control and self-efficacy. British journal of social psychology 1995;34(2):199-220.

438. Yzer M. Does perceived control moderate attitudinal and normative effects on intention? A review of conceptual and methodological issues. In: Prediction and change of health behavior: Applying the reasoned action approach; 2007. p. 107-123.

439. White KM, Smith JR, Terry DJ, Greenslade JH, McKimmie BM. Social influence in the theory of planned behaviour: The role of descriptive, injunctive, and in-group norms. British Journal of Social Psychology 2009;48(1):135-158.

440. Hagger MS, Chatzisarantis NLD. First- and higher-order models of attitudes, normative influence, and perceived behavioural control in the theory of planned behaviour. British Journal of Social Psychology 2005;44(4):513-535.

441. Salvalaggio G, Dong K, Vandenberghe C, Kirkland S, Mramor K, Brown T, et al. Enhancing screening, brief intervention, and referral to treatment among socioeconomically disadvantaged patients: study protocol for a knowledge exchange intervention involving patients and physicians. BMC health services research 2013;13:108.

442. Kelleher S, Cotter P. A descriptive study on emergency department doctors' and nurses' knowledge and attitudes concerning substance use and substance users. International Emergency Nursing 2009;17(1):3-14.

443. Warren OU, Sena V, Choo E, Machan J. Emergency Physicians' and Nurses' Attitudes towards Alcohol-Intoxicated Patients. The Journal of Emergency Medicine 2012;43(6):1167-1174.

444. Hungerford D. Potential impact of screening and brief intervention programs in emergency care settings. In: Cherpitel C, editor. Alcohol and Injuries: Emergency Department Studies in an International Perspective. Geneva: World Health Organization; 2009. p. 209.

445. Maio RF. Alcohol and injury in the emergency department: opportunities for intervention. Annals of emergency medicine 1995;26(2):221.

446. Cherpitel C. Drinking Patterns and Problems: A Comparison of Primary Care with the Emergency Room. Subst Abus 1999;20(2):85-95.

447. Cherpitel C, Ye Y. Trends in alcohol- and drug-related emergency department and primary care visits: data from four U.S. national surveys (1995-2010). Journal of studies on alcohol and drugs 2012;73(3):454-458.

448. Lundahl B, Moleni T, Burke BL, Butters R, Tollefson D, Butler C, et al. Motivational interviewing in medical care settings: A systematic review and meta-analysis of randomized controlled trials. Patient Education and Counseling 2013;93(2):157-168.

449. Klein WM, Harris PR. Self-affirmation enhances attentional bias toward threatening components of a persuasive message. Psychological Science 2009;20(12):1463-1467.

450. CASA. Missed opportunity: CASA national survey of primary care physicians and patients on substance abuse. Josiah Macy Jr. Foundation, UIC: National Center on Addiction and Substance Abuse at Columbia University; 2000.

451. Cunningham R, Bernstein SL, Walton M, Broderick K, Vaca FE, Woolard R, et al. Alcohol, Tobacco, and Other Drugs: Future Directions for Screening and Intervention in the Emergency Department. Academic Emergency Medicine 2009;16(11):1078-1088.

452. Herbert KE, Urmie JM, Newland BA, Farris KB. Prediction of pharmacist intention to provide Medicare medication therapy management services using the theory of planned behavior. Research in Social and Administrative Pharmacy 2006;2(3):299-314.

453. Creswell JW. Qualitative Inquiry and Research Design : Choosing Among Five Traditions. Thousand Oaks, Calif: Sage Publications; 1998.

454. Onwuegbuzie AJ, Dickinson WB, Leech NL, Zoran AG. Toward more rigor in focus group research: a new framework for collecting and analyzing focus group data. International Journal of Qualitative Methods 2009;8(3).

455. Green CA, Duan N, Gibbons RD, Hoagwood KE, Palinkas LA, Wisdom JP. Approaches to mixed methods dissemination and implementation research: methods, strengths, caveats, and opportunities. Administration and Policy in Mental Health and Mental Health Services Research 2014:1-16.

456. Creswell JW, Clark VLP. Designing and Conducting Mixed Methods Research: SAGE Publications; 2011.

457. Creswell JW, Klassen AC, Plano Clark VL, Smith KC. Best practices for mixed methods research in the health sciences. Bethesda (Maryland): National Institutes of Health 2011.

458. Fry M. An ethnography: Understanding emergency nursing practice belief systems. International emergency nursing 2012;20(3):120-125.

459. Bazeley P. Analysing qualitative data: More than 'identifying themes'. Malaysian Journal of Qualitative Research 2009;2(2):6-22.

460. Bradley EH, Curry LA, Devers KJ. Qualitative Data Analysis for Health Services Research: Developing Taxonomy, Themes, and Theory. Health Services Research 2007;42(4):1758-1772.

461. Bendassolli PF. Theory Building in Qualitative Research: Reconsidering the Problem of Induction; 2013.

462. Broyles L, Rodriguez K, Kraemer K, Sevick M, Price P, Gordon A. A qualitative study of anticipated barriers and facilitators to the implementation of nurse-delivered alcohol screening, brief intervention, and referral to treatment for hospitalized patients in a Veterans Affairs medical center. Addiction Science & Clinical Practice 2012;7(1):7.

463. Babl FE, Davidson A. A primer for clinical researchers in the emergency department: Part II: Research science and conduct. Emergency Medicine Australasia 2010;22(5):407-417.

464. Morgan DL. Focus Groups. Annual Review of Sociology 1996;22(1):129-152.

465. Morgan DL. Reconsidering the Role of Interaction in Analyzing and Reporting Focus Groups. Qualitative Health Research 2010;20(5):718-722.

466. Paton A. Barriers to education about alcohol. J R Soc Med 1992;85(8):476-8.

467. Stewart DW, Shamdasani PN, Rook DW. Group Dynamics and Focus Group Research. In: Stewart DW, Shamdasani PN, Rook DW, editors. Focus Groups. 2nd ed: SAGE Publications, Ltd.; 2007. p. 19-37.

468. Hesse-Biber SN, Leavy P. Focus group interviews. In: Leavy P, editor. The practice of qualitative research. Thousand Oaks: Thousand Oaks : SAGE Publications; 2006. p. 163-192.

469. Broyles LM, Rodriguez KL, Price PA, Bayliss NK, Sevick MA. Overcoming Barriers to the Recruitment of Nurses as Participants in Health Care Research. Qualitative Health Research 2011;21(12):1705-1718.

470. Kenna GA, Wood MD. Alcohol use by healthcare professionals. Drug and Alcohol Dependence 2004;75(1):107-116.

471. Gläser J, Laudel G. Life With and Without Coding: Two Methods for Early-Stage Data Analysis in Qualitative Research Aiming at Causal Explanations; 2013.

472. Aalto M, Pekuri P, Seppä K. Obstacles to carrying out brief intervention for heavy drinkers in primary health care: a focus group study. Drug and Alcohol Review 2003;22(2):169-173.

473. Berelson B. Content analysis in communication research. New York, NY, US: Free Press; 1952.

474. Krueger RA. Analyzing focus group interviews. Journal of wound, ostomy, and continence nursing : official publication of The Wound, Ostomy and Continence Nurses Society / WOCN 2006;33(5):478.

475. Berkowitz S. Analyzing qualitative data. In: Friechtling J, Sharp L, Westat, editors. User-Friendly Handbook for Mixed Methods Evaluations (Chapter 4). VA: National Science Foundation, Directorate of Education and Human Resources; 1997.

476. Flick U. The SAGE Handbook of Qualitative Data Analysis: SAGE Publications; 2013.

477. Strauss A, Corbin JM. Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory: SAGE Publications; 1998.

478. Morse JM. The Significance of Saturation. Qualitative Health Research 1995;5(2):147-149.

479. Kinchin I, Streatfield D, Hay D. Using concept mapping to enhance the research interview. International Journal of Qualitative Methods 2010;9(1).

480. Novak JD, Cañas AJ. The theory underlying concept maps and how to construct them. Florida Institute for Human and Machine Cognition 2006;1.

481. Trochim WMK. An introduction to concept mapping for planning and evaluation. Evaluation and Program Planning 1989;12(1):1-16.

482. Morgan DL. Focus groups as qualitative research: Sage Publications; 1997.

483. Potter WJ, Levine-Donnerstein D. Rethinking validity and reliability in content analysis. Journal of Applied Communication Research 1999;27(3):258-284.

484. Faux J. Pretesting survey instruments. Global Review of Accounting and Finance 2010;1(1):100-111.

485. Cartwright AKJ. The attitudes of Helping Agents Towards the Alcoholic Client: The Influence of Experience, Support, Training, and Self-Esteem. British Journal of Addiction 1980;75(4):413-431.

486. Wilt S, Hubbard A, Thomas A. Knowledge, attitudes, treatment practices, and health behaviors of nurses regarding blood cholesterol and cardiovascular disease. Preventive Medicine 1990;19:466-475.

487. Shaw ME, Wright JM. Scales for the measurement of attitudes: McGraw-Hill; 1967.

488. Oliansky MA, Schoener EP. Use of the SAAS to examine age gender and ethnic differences in attitudes toward substance use in a non medical college sample Substance Abuse 1988;9(4):194-204.

489. Drake C. An investigation into the attitudes of those in the field of addiction treatment towards the adoption of evidence based practices. Fargo, ND: North Dakota State University; 2009.

490. Iqbal N, McCambridge O, Edgar L, Young C, Shorter GW. Health-care professionals' attitudes across different hospital departments regarding alcohol-related presentations. Drug and Alcohol Review 2015:n/a-n/a.

491. Ayers S, Olander EK. What are we measuring and why? Using theory to guide perinatal research and measurement. Journal of Reproductive and Infant Psychology 2013;31(5):439-448.

492. Prestwich A, Webb TL, Conner M. Using theory to develop and test interventions to promote changes in health behaviour: evidence, issues, and recommendations. Current Opinion in Psychology 2015;5:1-5.

493. Acton GJ. Theory-testing research: Building the science. Advances in nursing science 1991;14(1):52-61.

494. Waller S, Thom B, Harris S, Kelly M. Perceptions of alcohol-related attendances in accident and emergency departments in England: a national survey; 1998.

495. Chappel JN, Veach TL, Krug RS. The substance abuse attitude survey: an instrument for measuring attitudes. Journal of studies on alcohol 1985;46(1):48.

496. Watson H, Maclaren W, Kerr S. Staff attitudes towards working with drug users: development of the Drug Problems Perceptions Questionnaire. Addiction 2007;102(2):206-215.

497. Gorman DM, Cartwright AKJ. Implications of using the composite and short versions of the Alcohol and Alcohol Problems Perception Questionnaire (AAPPQ). British Journal of Addiction 1991;86(3):327-334.

498. Pulford J, McCormick R, Wheeler A, Firkin P, Scott I, Robinson G. Alcohol assessment: the practice, knowledge, and attitudes of staff working in the general medical wards of a large metropolitan hospital. Journal of the New Zealand Medical Association 2007;120(1257):U2608.

499. Christian LM, Dillman DA, Smyth JD. The effects of mode and format on answers to scalar questions in telephone and web surveys. Advances in telephone survey methodology 2008;12:250-275.

500. Williams J. Comparing electronic and paper surveys. Australian and New Zealand Journal of Public Health 2012;36(1):12-14.

501. Tourangeau R, Rasinski KA. Cognitive processes underlying context effects in attitude measurement. Psychological bulletin 1988;103(3):299.

502. Tourangeau R, Yan T. Sensitive questions in surveys. Psychological bulletin 2007;133(5):859.

503. Alwin DF. Margins of error : a study of reliability in survey measurement / Duane F. Alwin. Hoboken, N.J.: Hoboken, N.J. : Wiley-Interscience; 2007.

504. Alwin DF, Krosnick JA. The reliability of survey attitude measurement the influence of question and respondent attributes. Sociological Methods & Research 1991;20(1):139-181.

505. Norman G. Likert scales, levels of measurement and the “laws” of statistics. Theory and Practice 2010;15(5):625-632.

506. Armstrong R. The Midpoint On A Five Point Likert Type Scale. Perceptual and Motor Skills 1987;64:359-362.

507. Collins D. Pretesting survey instruments: an overview of cognitive methods. Qual Life Res 2003;12(3):229-38.

508. Cohen J. Statistical power analysis. Current directions in psychological science 1992;1(3):98-101.

509. Faul F, Erdfelder E, Buchner A, Lang A-G. Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. Behavior research methods 2009;41(4):1149-1160.

510. Faul F, Erdfelder E, Lang A-G, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods 2007;39(2):175-191.

511. Field A. Discovering statistics using IBM SPSS statistics: Sage; 2013.

512. Gupta MR, Chen Y. Theory and use of the EM algorithm: Now Publishers Inc; 2011.

513. Tabachnick B, Fidell L. Using Multivariate Statistics, 6th International edition (cover) edn. In: Sage Publications, Thousand Oaks; 2013.

514. Pallant J. SPSS survival guide: a step by step guide to data analysis using IBM SPSS. In: Sydney: Allen & Unwin; 2013.

515. Indig D. Detection of alcohol-related emergency department presentations. NSW, Australia: University of New South Wales; 2007.

516. Bartlett MS. A note on the multiplying factors for various chi square approximations. Journal of the Royal Statistical Society. Series B (Methodological) 1954;16(2):296-298.

517. Kaiser HF. A second generation little jiffy. Psychometrika 1970;35(4):401-415.

518. Yokell MA, Camargo CA, Wang NE, Delgado MK. Characteristics of United States Emergency Departments that Routinely Perform Alcohol Risk Screening and Counseling for Patients Presenting with Drinking–related Complaints. Western Journal of Emergency Medicine 2014;15(4).

519. Bendtsen P, Anderson P, Wojnar M, Newbury-Birch D, Mussener U, Colom J, et al. Professional's Attitudes Do Not Influence Screening and Brief Interventions Rates for Hazardous and Harmful Drinkers: Results from ODHIN Study. Alcohol Alcohol 2015;50(4):430-7.

520. Agley J, Gassman RA, Vannerson J, Crabb D. Assessing the relationship between medical residents' perceived barriers to SBIRT implementation and their documentation of SBIRT in clinical practice. Public Health 2014;128(8):755-758.

521. Lowry PB, Gaskin J. Partial least squares (PLS) structural equation modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. IEEE Transactions on Professional Communication 2014;57(2):123-146.

522. Schumacker RE, Lomax RG. A Beginner's Guide to Structural Equation Modeling: Third Edition: Taylor & Francis; 2012.

523. Bollen KA. Structural equations with latent variables: John Wiley & Sons; 2014.

524. Brown M, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, editors. Testing Structural Equation Models. Newbury Park, CA: Sage; 1993. p. 136-162.

525. Kline RB. Principles and practice of structural equation modeling: Guilford publications; 2015.

526. Hooper D, Coughlan J, Mullen M. Structural equation modelling: Guidelines for determining model fit. Articles 2008:2.

527. Hu Lt, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural equation modeling: a multidisciplinary journal 1999;6(1):1-55.

528. Counselman FL, Marco CA, Patrick VC, McKenzie DA, Monck L, Blum FC, et al. A study of the workforce in emergency medicine: 2007. The American Journal of Emergency Medicine 2009;27(6):691-700.

529. Cork A, Ferns T. Managing alcohol related aggression in the emergency department (Part II). Int Emerg Nurs 2008;16(2):88-93.

530. Talbot AL, Dorrian J, Chapman J. Using the Theory of Planned Behaviour to examine enrolled nursing students' intention to care for patients with alcohol dependence: A survey study. Nurse Educ Today 2015;35(11):1054-61.

531. Bernstein E, Bernstein J, Feldman J, Fernandez W, Hagan M, Mitchell P, et al. An evidence based alcohol screening, brief intervention and referral to treatment (SBIRT) curriculum for emergency department (ED) providers improves skills and utilization. Subst Abus 2007;28(4):79-92.

532. Hettema JE, Ratanawongsa N, Manuel JK, Ciccarone D, Coffa D, Jain S, et al. A SBIRT Curriculum for Medical Residents: Development of a Performance Feedback Tool to Build Learner Confidence. Substance Abuse 2011;33(3):241-250.