**School of Nursing and Midwifery**




# Chronic Condition Self-Management Support: Evaluation of an On-Line Learning package




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# DECLARATION

"To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material that has been accepted for the award of any other degree of diploma in any other University"

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November 2013

**ABSTRACT**

The increasing prevalence of chronic diseases such as diabetes is creating an unprecedented challenge for healthcare services. A paradigm shift for health professionals away from the acute model of care towards one of patient self-management has proven to be very effective in the management of chronic illness. Subsequently several new programmes aimed at teaching health professionals the skills required to empower their patients to adopt self-management strategies have been developed. Unfortunately, several limitations and barriers prevent health professionals from engaging in these programmes. Barriers including distance, affordability, inconvenient programme timing, workplace pressures and other issues that lead to poor access, have been found to impede on a health professional's ability and willingness to participate in these programmes.

To provide access to a greater number of health professionals, Curtin University, in collaboration with the Australian Diabetes Educators Association (ADEA) and representatives from the other ADEA accredited universities around Australia, has created, implemented the Chronic Condition Self Management Support (CCSMS) on-line teaching resource. The CCSMS program was developed as an on-line educational resource to provide health professionals with the means to readily and affordably access training in the principles and practices of the self-management paradigm.

The aim of this study was to evaluate the process of the CCSMS program implementation and the potential impact it had on participant's attitudes and confidence in adopting the principles of CCSMS into their practice. A pre-post online survey containing validated instruments was employed to measure: The student's attitudes about patient self-

management empowerment; their confidence in facilitating self-management, and the level of student satisfaction with the programme.

180 students completed both the pre and post surveys. Overall attitudes towards patient self management were found to deteriorate, yet confidence in the facilitation of self-management empowerment to their patients increased, following completion of the programme. Attitudes and confidence were found to differ according to participant's characteristics such as occupation, workplace type, and time working in current occupation. Levels of satisfaction with the program's effectiveness, quality and structure were found to be high among all participants and across all participant characteristics.

With the demand for this type of program to be affordable, readily accessible and conveniently located, the CCSMS program is likely to provide health practitioners with the necessary skills and confidence required to facilitate patient self-management. With the increasing prevalence of chronic diseases seen worldwide, and the increasing benefits associated with patient empowerment and self-management, more health professionals need to be prepared and equipped with the skills and abilities to instil self-management principles in their clients. The CCSMS program clearly can meet these needs and if rolled out into undergraduate and post graduate health education programs, effectively prepare health professionals for the task ahead.

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# LIST OF ABBREVIATIONS

ABS          Australian Bureau of Statistics

ADEA        Australian Diabetes Educators Association

AHW         Aboriginal Health Worker

ANOVA     Analysis Of Variance

CCSM       Chronic condition self-Management

CCSMS      Chronic Condition Self-Management Support

CCM         Chronic Care Model

CDC          Centres of disease control

CHIRI        Curtin Health Innovation Research Institute

DAS          Diabetes Attitude Scale

DHS Vic    Department of Human Services Victoria

EIiCDM     Early Intervention into Chronis Disease Management

FHBHRU    Flinders Human Behaviour and Health Research Unit

IT            Information technology

SES          Socio-economic status

SDL          Self Directed Learning

WHO        World health Organisation

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## Chapter 1 Introduction

**Introduction**

The prevalence of chronic disease has increased steadily throughout the twentieth century and at an even more rapid rate over the past few decades. Unlike acute diseases where the traditional medical model of treatment is often curative and the duration is generally short, chronic disease is seldom cured and presents a lifetime management issue requiring a mode or treatment that differs from the traditional medical model approach.  The management of chronic disease has been mostly left to the person themselves with help from family and friends (Holman & Lorig, 2004), however many patients lack the training and skills to adequately manage their condition (Wagner et al., 2001). Furthermore, not everyone has the capacity to be able to care for themselves appropriately. People who are anxious and depressed, for example, are likely to lack motivation, while those who have a physical disability may be limited in their ability to perform activities of daily living (Kerr, Dattilo, & O'Sullivan, 2012; Lin et al., 2004). In addition, issues in families, such as a low income, relationship problems, and a lack of social support make it more difficult for people to cope (Edmonds-Myles, Tamborlane, & Grey, 2010).

As chronic disease becomes the largest threat to both health and health-care expenditure (AIHW., 2013; Lorig et al., 1999), the need for a new approach to care has been realised. Subsequently, the role  health professionals play in helping people achieve the best possible health outcomes, has been the subject of a great deal of research and more general academic activity in recent years (Katteri & Kalucy, 2009; S. Newman, Steed, & Muligan, 2004; NHPAC, 2010; Reuben & Tinetti, 2012).

A mis-match of care arises when the traditional medical model is applied to the management of chronic conditions and diseases. The traditional medical model discourages

patient self-management and patients are required to comply with the directions and instructions provided by their doctors and nurses (Anderson & Funnell, 2005, 2010). Even in countries with abundant health care resources, there are never enough doctors and nurses available to attend to day-to-day care requirements and patients are always left to manage the best they can. This mis-match of care contributes greatly to the over-utilisation of health services and facilities, and it is a major cause of the regular budget blow-outs that occur globally (Gately, Rogers, & Sanders, 2007; Glynn et al., 2011).

With the realisation that the current medical model of care is ineffective when applied to the management of chronic diseases, a paradigm shift away from this approach to care to one of patient empowerment and self-management has been occurring. To summarise recent evidence-based literature,  the provision of care that is more inclusive of the person is proving to have positive benefits in the management of chronic diseases, including lessening the burden for the individual and their family, reducing the burden on health care budgets, and ultimately reducing the burden on  society (Gately et al., 2007; Harvey & Docherty, 2007; Sawyer & Aroni, 2005). To facilitate this shift in approach for health professionals, several solutions have been sought and alternative models of care proposed, with the chronic care model becoming the dominant paradigm.

Several face to face training programs based on the chronic care model have been developed. These programs aim to foster the necessary knowledge and skills required for health professionals to be able to effectively implement a person-centred approach to their patient care. There is evidence however, that suggests participation in these programs can be problematic, and number of barriers and restrictions that prevent health professionals from actively engaging in these programs have been identified. As a result, the need for a new method of training, one that potentially overcomes these barriers was sought. The Chronic Condition Self-Management Support (CCSMS) program, with internet-based delivery,

flexible learning, and convenient access, was developed in Australia, and is proposed as a practical way to overcome most of the barriers that prevent health professional engaging in chronic disease management programs.

This project seeks to build on existing knowledge and understanding through the evaluation of a University-based on-line course in chronic disease management that has been implemented across five universities in Australia. The major research questions relate to the attitudes and behaviours of health professionals, mostly nurses, who work with people who have type 2 diabetes mellitus.

**Web-based self-management support education for health professionals**

A number of recent research reviews support the development and utilisation of web-based training. It is economically appropriate, convenient to use, and able overcome at least two of the major barriers to learning, those of insufficient time, and inconvenient location (Carroll et al 2009: Nagia, Hodson-Carlton, & Ryan, 2004: Childs et al 2005: Searle et al 2011). In 2010, a collaboration between the Curtin University School of Nursing and Midwifery (SONM), the Australian Diabetes Educators Association (ADEA), several key representatives from the four other ADEA accredited universities, and other prominent key health professionals who are leaders in the field of patient self-management, obtained government funding through the Australian Better Health Initiative to the develop the CCSMS web-based program. This web-based program is unique in that it focuses on the practical application of CCSMS skills, rather than the mere duplication other existing theoretically based resources (Glaister 2010b). The program was pilot tested during the first half of 2010 with students enrolled in a post-graduate diabetes education course at Curtin University. A pre-post survey was developed to evaluate the program, with preliminary findings showing promise of an effective educational tool.

The CCSMS program, which is hosted by Curtin University, has since been made available to health professionals studying diabetes education at one of the five ADEA accredited Australian postgraduate diabetes education courses, namely: Curtin University, Deakin University, Flinders University, University of Technology Sydney, and Mayfield Education Melbourne. The program has also been made available to undergraduate nursing students at these institutions, health professionals working in clinical areas across Australia, and ADEA members. This research project reports on the evaluation of the first Australia wide roll-out of the program, examining the process and impact outcomes of the program.

**Aim and objectives**

This project aims to undertake a process and impact evaluation of the CCSMS program to determine its effectiveness, the ease of its on-line delivery mode, and its value as an educational resource. The following research questions will be addressed:

- What influence do participant's demographic and work experience characteristics have on perceived effectiveness of the CCSMS program?

- What influence does existing information technology skills have on users' perceived effectiveness of the CCSMS program?

- What impact does the CCSMS program have on the attitudes of health professionals towards practicing self-management support?

- What impact does the CCSMS program have on the confidence of health professionals to practice self-management support?

The project is significant because it aims to determine the effectiveness of delivering a web-based CCSMS training program to health professionals throughout Australia. The results will be of great interest to the ADEA as well as the various universities involved. They will help to determine if the CCSMS program is continued in its present form or modified to

better suit the educational requirements of health professionals. Furthermore, it is anticipated that the findings of the study will provide evidence that supports the inclusion of the CCSMS into other health education courses beyond diabetes education. It, therefore, has the potential to influence the training of a much larger number of health professionals. With the ability to reach significant numbers of health professionals throughout Australia, this evaluation aims to determine the CCSMS program's usefulness in advancing the health care delivery provided by health professionals and thereby benefit the people who experience chronic disease and their families.

**Summary**

The steady increase in the prevalence of chronic disease throughout the last century, with its increasingly rapid acceleration in recent decades, has impacted greatly on the populations of both developed and developing countries, as well as current health-care systems and the provision of health care. The acute focused, medical model of care, with its doctor and nurse lead approach and lack of patient involvement, has proven ineffective at helping those with chronic conditions achieve the best possible health outcomes. It has become apparent that chronic conditions must be managed via a differently framework to acute diseases if the best patient health outcomes are to be attained and professional health care is to be affordable in the future. A framework of healthcare, one which is inclusive of patient involvement, is crucial to addressing patient needs and responding to the strain on healthcare resources.

Several models of care and training programs have been developed to foster the necessary knowledge and skills required for health professionals to be able to effectively implement a person-centred approach to their patient care. There is evidence, however, that participation in these programs can be problematic due to a number of barriers. As a result, the CCSMS program with its convenient access through internet-based delivery and flexible

learning may be a practical way to improve access to professional development training in chronic disease management.

This evaluation of the CCSMS program examines the process of its implementation and the impact it has on the attitudes and confidence of health professionals in adopting the principles of CCSMS into their practice. The results will help to determine if the CCSMS program is continued in its present form or modified. It is hoped that the program and this evaluation will ultimately advance health care delivery and benefit the people who experience chronic disease and their families.

**Chapter 2 Literature Review**

**Introduction**

Chronic diseases are a burden to the individuals concerned, their families, and society as a whole (AIHW, 2009). It is important for readers of this thesis to understand the history and context of chronic disease to better understand the rationale for, and the benefits of, a self-management approach to care. This understanding is the subject matter of the CCSMS program that is the focus of this evaluation.

The first section of this chapter briefly reviews recent evidence that increased life expectancy and increasing affluence have led to a growing prevalence of chronic disease amongst the ageing populations of developed nations, and how social gradients, health inequalities, and lifestyle changes have led to the increase of chronic diseases amongst those in developing nations and lower socioeconomic (SES) groups.

The second section reviews literature that summarises evidence for the burden chronic disease places on individuals and their families, as well as health care systems and society more generally. It is argued that the burden is greater when chronic disease is not managed appropriately.

The third section presents the rationale for providing care based on a self-management model. The evidence supporting the use of a self-management approach is reviewed. Several models of care that have been specifically developed to address the complexities of chronic diseases are critically examined. Current teaching models and teaching methodologies used to facilitate health professionals adopting the principles of self-management and having the capacity to empower their patients with self-management principles are then critically

reviewed. Finally, barriers that have been found to prevent some health professionals from engaging in a patient self-management program are identified and discussed.

The fourth and final section of the chapter introduces the current CCSMS project, and places it in the context of current teaching. The content and structure of the program is described, links are drawn between each of the seven modules and current teaching models, and the specific aims of this project's evaluation are discussed in detail.

**Increased life expectancy**

The life expectancy of people living in the early 20th Century in developed countries was considerably shorter due to hazardous living and working conditions, exposure to infectious disease, risky childbirth, and the fact that there was little or no organised health care (Cutler, Deaton, & Lleras-Muney, 2006; Soares, 2007). It was at about this time that changes to living standards began to occur.  Arguably, the most important change to occur was the provision of fresh water, free from contamination by pathogens, such as cholera and typhoid (Cutler et al., 2006). Better standards of hygiene were developed, with the advent of the flushing toilet and the quality of housing was raised generally (Thomson, Thomas, Sellstrom, & Petticrew, 2009). Access to meat, fruit, and vegetables of a reasonable quality improved as farming became more mechanised and the use of agricultural chemicals increased (Cutler et al., 2006).

All of these changes resulted in better living conditions for many working class as well as well-to-do families (CDC, 2011; Wen, Browning, & Cagney, 2003). Occupational health and safety movements saw improvements in working condition and practices occur, reducing workplace injuries and fatalities (Robson et al., 2007; Shannon, Robson, & Sale, 2001; Vergara, 2005).Vaccines were successfully developed against many infectious diseases and antibiotics were developed to treat others (Plotkin, 2005). Concurrently from about the

mid 1930's, maternal mortality rates also declined, as formerly risky childbirth conditions were replaced with safer standards of hygienic obstetric care (Bhutta et al., 2008; Loundon, 2000)

As living conditions improved and infectious diseases were better controlled, the populations of developed countries experienced increased longevity. In Australia, for example, the average life expectancy in 2011 was approximately 85 years, compared to the early 20th century when it was only 45 years (ABS, 2011a). Similar improvements to life expectancy have been observed in other developed countries, where improvements in health and better living conditions were paralleled (Heyworth, Hazell, Linehan, & Frank, 2009; Omodei & Fontana, 2011). Paradoxically, with higher life expectancy came a significant increase in both the incidence and the prevalence of chronic disease. The likelihood of a person having a chronic disease today increases in a linear fashion with their age (Rice & Fineman, 2004). In more recent times, the incidence of many chronic diseases has remained stable, or even declined, in most developed countries. The prevalence, however, has continued to increase as those with chronic diseases are living longer due to healthier lifestyles, new medications, and medical technology (Alberti, 2001; Howse, 2006). In most developing countries, on the other hand, both the incidence and the prevalence of chronic disease are continuing to increase rapidly and the health care systems in these countries are unable to cope with the increased demand for services (Nugent, 2008; WHO, 2007, 2010; Yach, hawkes, Gould, & Hofman, 2004).

**Social determinants of health and disease**

While improved living conditions in developed countries have led to increased affluence and longevity for some people, others have not been so fortunate. Social gradients in health and their influence on most chronic diseases are becoming much better understood (AIHW., 2013; Fleischer, Diez Roux, Alazraqui, Spinelli, & De Maio, 2011; Harper, Lynch,

& Davey Smith, 2011). That is, those who have less education, more menial jobs, and lower incomes, on average, have a higher incidence of diseases, such as cardiovascular disease and type 2 diabetes (Clougherty, Souza, & Cullen, 2010; Elovainio et al., 2011). Those who have the lowest socioeconomic status (SES) fair worst, those of average SES do better, and those with the highest SES do best (Elovainio et al., 2011). Furthermore, children who grow up in lower SES households are exposed to all the negative influences associated with their parents' situation. Children who experience conflict laden parental relationships, aggressive and harsh parenting, and parental anxiety and depression, are likely to replicate these features in their own families when they become adults, resulting in an intergenerational transmission of disadvantage (Wiborg & Hansen, 2009). Additionally factors such as neighbourhood violence and crime, pollution, and overcrowding which are common to lower SES neighbourhoods, are known to have an influence on wellbeing. Both individual and family socioeconomic and psychosocial factors, as well as community characteristics are known to be risk factors for chronic disease through stress related pathways (McEwen & Gianaros, 2010)

At an individual and family level, life experiences along with the material disadvantage arising from a lower income, and the social status associated with being in a lower SES group, are very stressful. (Williams, Mohammed, Leavell, & Collins, 2010). Lower incomes often result in families experiencing relative poverty when compared with others in their community. The lack of ability to access and/or provide adequate or reasonable access to education, healthcare and other life necessities is stressful, affecting all family members (Kendall & Tallon, 2011). Not only does excessive stress have an impact on short term cognitive functioning, it can lead to anxiety and depression, which not only has a negative impact on a person's (and their family's) experience of chronic disease, it directly impacts on their ability to cope with and manage the chronic condition (Falvo, 2013). The

human body utilises several systems and mechanisms to cope with these stresses (McEwen & Gianaros, 2010). Together they ensure that physiological and psychological processes are regulated, allowing the body to cope with and adapt to stress. When employed in the short term, these processes lead to homeostasis. However if the stresses become chronic, the processes become maladaptive and allostatic load occurs; the sequilae of which is wear and tear of the body and brain, culminating in ill health (McEwen & Gianaros, 2010) which is often manifested as chronic disease.

**The burden of disease on individuals, families, and society**

People are now living longer with chronic diseases and suffering from a greater number of morbidities and co morbidities (McElhaney 2010: Bodenheimer 2009). For many, chronic disease has a major impact on their quality of life and for some, their disability can be devastating (NHPAC, 2010). Importantly the impacts of chronic disease are mainly apparent at three specific levels; that of the individual, the family and society. There is a plethora of information available in current literature regarding the burdens imposed by chronic diseases, illnesses and conditions. For the purposes of succinctness, this chapter provides a brief overview of the more common burdens.

**Individual burden.**

Certain aspects of the disease process itself can impact on a person's sense of wellbeing, impeding on their ability and often desire to participate in activities of normal daily life, psychosocial functioning, emotional wellbeing and ultimately affecting their quality of life (Kolotkin et al 2006). Chronic pain is a prime example; it can limit a person's ability and desire to engage in many pursuits, often preventing or impeding participation in many "normal "activities of daily living (Stineman et al 2011). Chronic pain can interfere with a person's ability to participate in their regular working activities, engage in recreational

activities and enjoy other life events. Furthermore, recent literature also draws attention to the notion that the fear of chronic pain has an impact far greater and more disabling than the actual pain itself, and is a precursor of clinical depression (Cook et al 2006:Grombex et al 1999)

The natural progression of many chronic diseases is associated with an increasing risk and incidence of complications that have the potential to further impact on quality of life. Diabetes Mellitus is a prime example, with many complications relating to neuropathy, nephropathy and retinopathy. Problems such as poor wound healing which can lead to an increased risk of both lower leg amputations and permanently disabled, renal damage that can ultimately result in renal failure and hasten death, retinal bleeding, intraocular damage and retinal detachment that can lead to partial to complete blindness, and sexual dysfunction that can affect a person's self-esteem and impact on normal sexual relations, the latter of which can lead on to a plethora of other health related issues (Kolotkin et al 2006), are just a few of the chronic complications associated with this disease.  Each chronic disease has its own set of potential complications and issues, all of which have the propensity to have an equally as devastating impact on the individual involved.

The treatment and management regimens of chronic diseases can further impact on the individual. Current literature confirms that not only can management regimens be time consuming, the iatrogenic side effects associated with the some curative medical interventions and treatments can be quite nasty, impacting negatively on the person involved (Verschuren et al 2010). One notable iatrogenic effect is the impact on sexual wellbeing and sexual function. Issues such as erectile dysfunction, vaginal dryness, and loss of libido are common side effects of many of the medications used in the treatment of chronic diseases, especially those used to treat cancers (chemotherapy), depression and high blood pressure (Verschuren et al 2010:WebMD 2011). Furthermore, the iatrogenic effects of some

medications can lead to the development of other co-morbid chronic diseases. Treatments for conditions such as rheumatoid arthritis for example, that involve the long term use of glucocorticoid drugs, have been found to increase glucose intolerance leading to type two diabetes, adversely affect dyslipidaemia and exacerbate atherosclerosis, thereby increasing the risk for cardiovascular disease (DaSilva et al 2005).

The long term nature of chronic diseases often means that the treatment is time consuming and tedious, with long periods away from work, home and often family required that can be burdensome and stressful for both the person and their family (Sav et al., 2013). The need to attend regular appointments and the need to obtain ongoing medical treatment not only contribute to stress, they are cited amongst a leading cause of workplace absenteeism (AIHW 2009:Lacroix 2011: ADA 2013) and treatment burden, which can impact negatively on the persons sense of self-esteem. As treatment regimens progress, leave entitlements are often exhausted, and as changes to employment status often occur, income is affected (Sav et al., 2013). These treatment burdens are found to contribute to and exacerbate stress, depression and anxiety and reduce adherence to treatment regimens (Sav et al., 2013). Examination of current literature also reveals that stress from any cause is problematic, and where it is found to exists in the long term, ultimately contributes to allostatic load, resulting in worse health outcomes (Logan & Barksdale, 2008; McEwen & Gianaros, 2010; Sav et al., 2013).

The complications of a chronic disease not only impact on the person's physical health, they often negatively impact on mental health and wellbeing. A brief review of current and recent psychosocial literature reveals that not only does having a complication affect mental health and wellbeing, the thought and fear of acquiring the complications associated with the disease has been linked to the increased incidence of co-morbid clinical depression and anxiety (Anderson, Freedland, Clouse, & Lustman, 2001). The WHO in their

World health Surveys cite clinical depression as a globally significant public health issue (Yohannes, Willgoss, Baldwin, & Connolly, 2010), however when it is a co-morbid feature with a chronic disease, the impact it has incrementally adds to the illness burden, and worsens health (Moussavi et al., 2007).

**Family burden.**

A great deal of psychosocial research investigating the impact and effects chronic diseases have on both the person and their families has been undertaken. While there are many important issues that have been uncovered by this research, the following section will draw on some of the findings that relate to the psychological effects on both the person and their family, the impacts on family structure and changes in family dynamics, and, the treatment burden experienced by the family.

Each member of the family is exposed to the stresses and burdens associated with chronic disease. Seeing their mother, father, brother, sister, husband, wife or significant other ill, can give rise to stressful reactions and emotions within the family. The symptoms of the illness, mood, and need for physical and emotional support experienced by the person with the chronic condition, take their toll on and become a burden to family members (Goldberg & Rickler, 2011; Loukissa, 1995). In addition, family members may feel guilty as they often feel they are ill-prepared or inadequately skilled to provide care, something that often has unexpectedly been thrust upon them, creating stressful situations (Sav et al., 2013), simultaneously, feelings of guilt may also be experienced by the ill person as they make increasing demands on their family for care and assistance (Lawrence, 2012). Hickman and Douglas (2010), further argue that direct association with a family member who has a chronic illness, especially when in the critical phase, is psychologically taxing, and moreover when the fear of imminent death of the patient exists, an even greater risk of exposure to psychologically detrimental effects occurs (Hickman & Douglas, 2010).

Changes in the structure and function of the family unit are often a necessity when chronic disease and illness present. The changes depend on who in the family has the illness, the age of the person with the illness, and the position within the family dynamics of the person. Roles within the family structure change. Partners can become carers for their significant others while their role within the family structure may need to change from one of breadwinner to one of carer, limiting or reducing available income within the family which ultimately impact on the entire family as the income the family receives is often drastically reduced (Baanders & Heijmans, 2007; Glaister, 2010a). Parents become carers for their ill child, while adult children become carers for their parents. The impact of the change caused through chronic disease can indirectly effect the entire family unit (Hickman & Douglas, 2010).

Finally the burdens associated with treatments also take their own toll on the family. For example, the time associated with obtaining treatment and the travel to and from hospital to receive treatment. Both can result in the absence from home of those responsible for a normal household, leaving the burden of such falls to someone else within the family to pick up the tasks (Sav et al., 2013).

**Societal burden.**

The societal costs associated with providing sufficient care to meet the increased incidence of chronic disease and co-morbid chronic complications, the subsequent drain on health care resources, and the overall economic implications arising from the need for additional spending to meet such demands, are proving to be a challenge for government health budgets worldwide (AIHW, 2009; CDC, 2009; Nugent, 2008; WHO, 2010).

Kidney disease and cardiovascular disease for example, are both chronic diseases in their own right. As people continue to age, they are increasingly being found to be common

co-morbid complications associated with diabetes; and have become two increasingly common disease manifestations that are having some of the greatest impacts on health care resources and budgets recently witnessed (Go, Chertow, Fan, McCulloch, & Hsu, 2004; Herman, 2011; Thorpe, Ogden, & Galactinova, 2010). As conditions such as kidney disease and cardiovascular disease continue to increase, the costs of their management also increases, and needs to be borne by the health care system. This forms a burden on society that will continue to worsen (Gately et al., 2007; Jordan & Osborne, 2007; NHPAC, 2010; Omodei & Fontana, 2011). Furthermore, with the prevalence of chronic diseases increasing, more people are accessing their local GP clinics or hospital outpatient departments seeking medical attention than ever before, and health care resources and services are becoming inundated and overwhelmed with the increasing burden.

**Rationale for self-management model**

Health care in the western world has traditionally been guided by the medical model of care where illness is treated as a breakdown or malfunction of a body part, and where a simple solution and a quick easy cure exist (J. Newman & Vidler, 2006; S. Newman, 2008). This approach to care has proven to be very effective when applied to the management of acute, short term illnesses (Shah, Mountain 2007). Chronic diseases however can have an extremely complex nature, multiple causes, require ongoing continuous management, and seldom have a cure. As more people are living longer, the incidence and the prevalence of chronic disease has increased at an alarming rate and the medical model of care is no longer appropriate (Alemayehu & Warner, 2004; Casalino, 2005; K. Coleman, Austin, Brach, & Wagner, 2009; Wagner et al., 2001), creating an unprecedented health care issue.

Research conducted in the last decade has shown that the inclusion and involvement of patients in the management of their own health care using a patient empowerment model is a solution that is proving to have great success in addressing this issue (Anderson &

Funnell, 2005; Aujoulat, d'Hoore, & Deccache, 2007; M. Coleman & Newton, 2005).Patient inclusion and empowerment has been found to improve patient health outcomes, reduce the burden of chronic illness, decrease the utilisation of health services and the impact on health resources, and ultimately provide cost savings for healthcare budgets (Battersby, Martin, et al., 2007; Gordon & Galloway, 2008).

Consequently, many government health authorities have directed that self-management and patient empowerment principles be included in health professional training and education (Degeling, Maxwell, Kennedy, & Coyle, 2003; Truffer et al., 2010). In Australia for instance  Key directions 35 and  36 of the National Chronic Disease Strategy (2006) direct that the core competencies of chronic disease prevention and care be included in the education, training and accreditation of health workers, whilst encouraging health care providers, at the points where people enter into the health care system, to actively pursue and promote a self-management model of care (NHPAC, 2010).

**Evidence supporting self-management**

A growing collection of research shows that the education and empowerment of patients with chronic diseases is a cornerstone in their health care (Sarkar, Fisher, & Schillinger, 2006). This section presents evidence that improved patient self-efficacy and effective collaboration between patients and their health care providers are two important mechanisms that lead to overall health benefits and contained costs (Bodenheimer, Lorig, Holman, & Grumbach, 2002). Among the many benefits resulting from self-management are: a greater compliance with medications and interventions, improved health outcomes, improvements in quality of life, and a reduction in health service utilisation and expenditure (M. Coleman & Newton, 2005; Esperat et al., 2012; Lindner, Menzies, Kelly, Taylor, & Shearer, 2003; Masters et al., 2013; Nolte & Osborne, 2012).

**Improved adherence to treatment regimens.**

Empowered patients display a greater adherence to and acceptance of treatment regimens when they are involved in the planning and implementation of their own care. For example, the self-management cohort of a recent randomised controlled study conducted by the University of California San Francisco into the self-management of Asthma, demonstrated a consistently higher, nine fold improvement in adherence to treatment regimens when compared to the control group (Janson, McGrath, Covington, Cheng, & Boushey, 2009). Studies into other chronic diseases have reached similar conclusions, with statistically significant differences in favour of self-management, found between control groups and those randomised to self-management arms in several studies. Improved adherence and uptake of exercise regimens were observed in a study into arthritis (Marks, Allegrante, & Lorig, 2005), while a high level of medication adherence, healthy eating patterns and increased calorie expenditure due to physical activity were also observed in several diabetes  self-management studies (King et al., 2010; Schechter & Walker, 2002). In a recent review of literature, Samoocha et al. (2010) identified 14 RCT studies that were conducted between January 1985 and January 2009 that show similar benefits for patients who are empowered and knowledgeable (Samoocha, Bruinvels, Elbers, Anema, & van der Beek, 2010).

**Improved health outcomes.**

Self-efficacy and self-management are proving to be an important intervention for improved morbidity and health outcomes in chronic diseases. People who actively participate in the management of their own health care have greater confidence and success in achieving both short and long term health management goals when compared with those who do not. Additionally as patients learn more about their disease and experience success, achieve goals and reach targets, self-efficacy strengthens providing the patients with the drive for even

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greater success with self-management (Sarkar et al., 2006). For example, in a randomised controlled trial into the use of self-management strategies with Chronic Obstructive Pulmonary Disorder, a team from the Glasgow infirmary and University of Glasgow found the coping skills patients developed through self-management education enhanced early identification of symptoms heading towards an exacerbation, and prompted early treatment, improving health outcomes (Bucknall et al., 2012), Similarly high self-management / self-efficacy levels amongst arthritis patients were found to be statistically significant predictors of; a greater ability to manage pain, improved ability to control stress, and greater capacity to carry out activities of daily living (Marks et al., 2005). Furthermore, the literature also reveals that since that since the 1990's when the focus on self-management started to gain momentum, the benefits associated with self-management of diabetes have become more evident (Boren, Fitzner, Panhalkar, & Specker, 2009; Norris, Engelgau, & N., 2001) Improvements in HbA1C levels, glycaemia levels and glycaemic control, blood pressure, cholesterol and foot health are amongst the improved health outcomes recognised (Bodenheimer, Wagner, & Grumbach, 2002; Funnell et al., 2009).

**Improved quality of life.**

Considerable evidence has also emerged indicating how patient or clinician collaboration in the self-management of chronic diseases improves quality of life (Street, Makoul, Arora, & Epstein, 2009). People are benefitting not only from improved health outcomes, but also from the positive psychological effects associated with the confidence success in self-management brings and the control patients have gained over the management of their condition. This has been well documented in the literature with several research studies confirming people are happier, show lower incidences of depression and anxiety, and self- report less stress than those who have not embraced self-management (Davies et al., 2008; Street et al., 2009).

**Reduced reliance on health care services.**

Many studies are finding that where patients are involved in the self-management of their chronic disease, they reduce their reliance on health care services and an observable reduction in the cost impact on health care budgets occurs (Bodenheimer, Lorig, et al., 2002; Gallagher, Donoghue, Chenoweth, & Stein-Parbury, 2008; Gordon & Galloway, 2008; Lindner et al., 2003; Reuben & Tinetti, 2012; Street et al., 2009). A connection has been made by several scholars linking self-management and reductions in hospitalisations, the utilisation of health care services including ED attendance and a reduction in attendance at the local GP (Gallagher et al., 2008; Lake & Staiger, 2010; Lorig et al., 2013; Misan, Harvey, Warren, Fuller, & Petkov, 2010). The evidence supporting these claims is growing, and as more studies are completed, the argument for the inclusion of patient self-management is strengthening (Harris, Williams, Zwar, & Powell-Davies, 2008). As previously mentioned, governments have become aware of the potential cost saving and benefits to public health and they are actively encouraging GPs and other health care professionals through health directives and policy, to adopt practices that empower their clients and patients with the principles of self-management (AIHW, 2009).

**Current teaching models**

The translation of a new framework of care into practice has resulted in a knowledge deficit and the requirement additional education and training for many health professionals. To facilitate the adoption of patient empowerment principles into clinical practice, a program, or model of care, that addresses a self-management support pedagogy had to be developed (Epping- Jordan, Pruitt, & Wagner, 2004; Grumbach, 2003). Given the complexities associated with chronic condition self-management however, a single one size fits all model of care has not been found to be appropriate (DHS Victoria, 2012; Lake & Staiger, 2010).

Teaching models have subsequently been created by both health professionals and academics, each with its own unique features, strengths and limitations (Lake & Staiger, 2010). A number of models designed to both guide health professionals and enable them with the attributes and skills required to include the principles of chronic disease self-management into their own practice have emerged. While the literature identifies other models of care, much has been written about those models which through popular use, are becoming traditional mainstays in the management of chronic disease. The Wagner model of care (CCM), the Flinders Program and the Lorig/Stanford models fall into this category. This chapter will summarise these models, as well as the more recently developed models of health coaching and motivational interviewing, and summarise what the literature reveals to be the strengths and limitations of each model.

A key work in researching self-management models was a project undertaken in 2010 by the Department of Health Victoria (DHS Vic) Australia. The project which resulted in the publication of fact sheet entitled "Common models of chronic disease self-management support" reviewed each model, providing a list of the features, strengths and limitations associated with each.

**The Wagner Chronic Care Model.**

The Wagner Chronic Care Model (CCM) was developed in the 1990's by Edward Wagner and a team from the MacColl Institute for Healthcare Innovation in Seattle USA. It is regarded as possibly the most influential and widely adopted chronic care model currently in existence (K. Coleman et al., 2009; Johnston, Liddy, Ives, & Soto, 2008). Wagner and his team identified six key areas for improvement and developed a model designed to improve chronic illness care, by shifting the focus from a physician centred approach to one of patient and health care team collaboration (Bodenheimer, Lorig, et al., 2002; Bodenheimer, Wagner, et al., 2002; Dancer & Courtney, 2010; Larsen, 2011; Wagner et al., 2001). Dancer and

Courtney (2010) and van Lieshout et al (2012) respectively confirm that the six key areas identified for improvement are: Heath care organisation; Community resources; Self-management support; Delivery system design; and Decision support and Clinical information systems (Dancer & Courtney, 2010; van Lieshout, Frigola Capell, Ludt, Grol, & Wensing, 2012).  Several studies conducted since 2002 have reported on and confirmed the positive effects associated with these improvements. For example Dancer and Courtney's research revealed evidence confirming the beneficial and positive changes achieved in chronic illness care following improvements in the above six areas (Dancer & Courtney, 2010).

Finally the studies undertaken into  the various self-management models reveal that although no one specific program is based on the CCM, many of its  principles are contained within most of the other chronic health care models currently in use (DHS Victoria, 2010; Taylor, Horey, & Swierissen, 2008).

**The Flinders Program.**

Developed by the Flinders Human Behaviour and Health Research Unit (FHBHRU) at Flinders University in Adelaide South Australia, the Flinders Model is a collection of tools which enable health professionals to undertake structured chronic disease self-management training. Pursuant to many of Wagner's "principles" the Flinders model teaches  how to assess self-management behaviours and problem solving abilities, how to collaborate effectively with patients to set goals, and how to develop an individualised care plan for their patient's (FHBHRU, 2011) .

Several core principles of self-management are contained in this model:  Knowledge of one's condition, following a care plan, actively sharing in decision making, monitoring and managing signs and symptoms, managing impacts on physical, emotional and social life, and adopting lifestyles that promote health.  Using standardised assessment and screening tools

such as the Partners in Health scale, cue and response interviews, problem solving and care planning questionnaires, health professionals, guided by the above principles, learn how determine the level of support, care and education patients need (Battersby, Harvey, et al., 2007; FHBHRU, 2011). A two day training program, and subsequent submission and approval of three case studies is a mandatory requirement of this course. Once completed, health professionals are equipped to work with their patients in a one on one setting, aiming to empower them with the principles of self-management support (DHS Victoria, 2010).

### *Flinders program strengths.*

Firstly the program promotes a person-centred focus by defining the person's health goals rather than the doctors. Secondly the program is highly individualised and can therefore address the needs of a larger number of people. Thirdly, training in the program supports self-management and chronic illness care by promoting system change within organisations and finally the program provides a good grounding in the differences between chronic and acute care (DHS Victoria, 2010; FHBHRU, 2011)

### *Flinders program limitations.*

Training in Flinders Program principles can present a challenge to health professionals (Jordan & Osborne, 2007). To become accustomed with and authorised to use the program principles in their own practice, health professionals are required to attend workshops or training courses, generally at centralised locations, and generally over at least two days duration. Furthermore, prior to being  endorsed and licensed to use the Flinders program principles in their practice,  health professionals are required to correctly and successfully complete three case studies which need to be submitted for approval to the trainers of the program (DHS Victoria, 2012; FHBHRU, 2011). In their 2010 report, DHS Vic also found that the program was time intensive, confronting for some, lacked the

provision of tools for ongoing self-management support and failed to provide skills for facilitation behaviour change (DHS Victoria, 2010).

**The Lorig / Stanford Model.**

The  Lorig/Stanford model, created by Stanford University School of Medicine and Dr Kate Lorig in the 1990's (Wellington, 2001), also draws on several of the principles the Wagner CCM promotes. To learn the skills required to impart  the principles of this training program to their patients and clients, health professionals must attend a three day training program where they receive instruction in;  managing and presenting group based education sessions to diversified patient groups, effective patient self-management principles, goal setting techniques; and patient empowerment (DHS Victoria, 2010). Recent works confirm that the Lorig/Stanford model enables health professionals to learn how to deliver a highly structured, six week group based program, where for 2 ½ hours each week over the program, patients are taught the core principles of self-management common to all models (DHS Victoria, 2010; Glasgow, Tracy Orleans, Wagner, Curry, & Solberg, 2001; Misan et al., 2010).

*Lorig / Stanford model strengths.*

Firstly the group setting of this model encourages empowerment through peer sharing and learning. Secondly, group based environments promote self-efficacy and reduced isolation amongst participants. Thirdly the strong goal setting approach and problem solving focus of the model greatly assisted patient learning and confidence (DHS Victoria, 2010)

*Stanford model limitations.*

Not everyone is suited to learning in a group environment as the capacity of the group environment was not suited to addressing the individual barriers of the group. The highly structured and inflexible nature of the course does not allow for different learning styles

within the group, and finally, the time required (6 weeks) to attend the course imposed difficulties and barriers on some of the participants  (DHS Victoria, 2010).

**Health Coaching (HC) and Motivational Interviewing (MI).**

An ample amount of literature has recently come to light that supports the notion of lifestyle and behavioural changes as being a key component to successfully self-manage chronic health conditions and improve health outcomes  (Butterworth, Linden, McClay, & Leo, 2006; DHS Victoria, 2010; Linden, Butterworth, & Prochaska, 2010). Health coaching and Motivational Interviewing are seen as "a way of working for health practitioners" that draws on a range of techniques and a set of tools adopted from psychology counselling and coaching to provide a client centred focus to care (DHS Victoria, 2010). Unlike the previous models, there is no set structure to HC or MI, which enables health practitioners to pick and choose from the tools provided. This freedom allows health professionals to provide client centred counselling, tailors to their patients, thereby helping them to understand poor behavioural patterns, adjust their behaviours and maintain behaviour changes (DHS Victoria, 2010; Gale, 2010; Knight, McGowan, Dickens, & Bundy, 2006; Lawn, 2010; Linden et al., 2010).

*Health Coaching / Motivational Interviewing strengths.*

Among the greatest benefit found in health coaching and motivational interviewing are their high degrees of flexibility and adaptability. Literature shows that the flexibility allows for the teaching of a range of different techniques that can be adapted to meet a client's needs, allowing for their incorporation into many areas of healthcare provision (Hogden et al., 2012). This results in the ability to meet a patient's needs, irrespective of at what stage of readiness for change they are. Furthermore DHS Vic found this flexible approach allowed for any training in this model, to be tailored to the needs of the agency

(DHS Victoria, 2010). Secondly, having undergone training in these models, health professionals not only gain the skills and confidence required to assess their patients' readiness and ability to enhance and engage in CCSM, they obtain the skills required to empower their patient to effectively self-manage their conditions and have a greater control of their own health (Bower et al., 2012b; Kosmala-Anderson, Wallace, & Turner, 2010).

### *Health Coaching / Motivational Interviewing limitations.*

DHS Vic found HC and MI can create boundary issues. For example, health professionals without a background in counselling, can feel inadequate, as they often slip into counselling mode but lack the skills to manage it (DHS Victoria, 2010). Another issue highlighted in the literature is the requirement for health professionals to attend training courses before being skilled in the use of health coaching and motivational interviewing techniques. Janette Gale (2010), a driving force behind both models in Australia, acknowledges completion of the training program is both time consuming and often inopportune, with attendance at courses causing workplace absences, inconvenient travel to training venues. Finally, the lack of formal structure to both models has proven problematic. DHS Vic found that the lack of formal structure negatively affected health professionals, specifically those from a non-counselling background , who found the counselling aspect difficult, impeding on the confidence in their ability to provide guidance to their patients (DHS Victoria, 2010; Hogden et al., 2012).

## Barriers to health professional learning and adopting CCSM principles

The need for continuous learning and ensuring that competencies are up to date is an essential component of any health professional's practice. However, a review of the literature

reveals that there are several barriers preventing health professionals from engaging in on-going training (Baker et al., 2010; Childs, Blenkinsopp, Hall, & Walton, 2005; Santos, 2012). Common barriers include: costs, access, time, and location. Several barriers to ongoing training are discussed in the remainder of this section.

Financial and economic constraints are recognised as one of the greatest barriers to learning. Insufficient funding, a lack of paid leave for employees to attend education courses, a lack funds to reimburse employees for the costs associated with attending courses, and a lack of personal funds to use in lieu of employer funds, are all cited as potential barriers to learning (Baker et al., 2010; Santos, 2012). Furthermore, it has been suggested that the provision of additional staff training is uneconomical, as management often struggle to find the additional funds from already stressed budgets (Searle, Thirbault & Greenberg 2011). Where self-funding is required to attend training courses, financial disincentives can also arise, forming yet another barrier to learning (Baker et al 2010). For example, Gopee (2005) found that those who were unable to attend training courses due to a lack of personal funds tended to experience feelings of negativity. Where neither organisations or individuals can afford funding to attend on-going training the issue of inequitable access arises (Childs et al., 2005).

After financial issues, time constraints and insufficient staff resources have been identified as the most significant barriers. Inflexible working hours, workload pressures, insufficient staffing coverage to replace those absent on training courses, and a lack of paid leave to attend training sessions are all recognised as a hindrance to learning (Baker et al 2010: Kennedy et al 2010: Santos 2012). Moreover, there is evidence that some staff who are able to leave their workplace to attend a training course experience feelings of betrayal and guilt at having to leave fellow staff to "pick up their workload" (Jordan & Osborne, 2007).

With the majority of health professional training programmes conducted in metropolitan locations, access is also an issue for those who live in rural and remote areas of the country (AIHW., 2005, 2008; Mitton, Dionne, Masucci, Wong, & Law, 2011). Attendance at metropolitan based training sessions is not always practical. The costs and the increased time associated with travel are both disincentives to attendance (Carroll, Booth, Papaioannou, Sutton, & Wong, 2009; Crawford, Vilvens, Pearsol, & Gavit, 2008).

There is evidence that indigenous students, whether they are living in urban, rural or remote areas, face additional barriers to learning, including displacement and alienation (Adams et al., 2005). Despite the moves to improve access to university study for indigenous students and make entry into courses more equitable, indigenous students continue to struggle with literacy and academic study skills, forming barriers to effective learning (Rose & Devonshire, 2004a).

As already noted, there is evidence that some health professionals are resistant to change, that they see the new paradigm merely a way of saving money for government rather than genuinely providing better care for the patient (Anderson & Funnell, 2005; Kirby, Dennis, Bazeley, & Harris, 2012). However a review of literature makes it clear that this is not a widely held view (Gordon & Galloway, 2008). Associated with this is the issue that some health professionals believe that they are already equipped and prepared to provide self-management support to their patients. They hold this view despite the fact that they come from backgrounds where these skills were not encouraged, and the prescriptive medical model of care, with its acute "doctor knows best" focus dominated their approach to patient care (Anderson & Funnell, 2010). However, as with all change, there has been resistance not only from doctors and nurses who find it easier to practice in the traditional way, but from patients, themselves. The reluctance of some patients to change and start taking charge of

their own health care needs exacerbates the issue. Not everyone wants to change the way they provide health care or to accept an alternative style of care.

Over many years, in both developed and developing countries, people have come to understand health in terms of disease and medical treatment, where healthcare is provided at the direction of doctors and nurses, whose approach to healthcare has placed them in charge (Kon, 2010; Neeraj & McHorney, 2000). Traditionally, people were told what to do, and how to manage their illness. Over time, many people have become accustomed to and comfortable with this approach to medical treatment, and expect to receive this style of health care delivery. To this end, many people, looking for someone to cure their illness, prefer this approach to care as they perceive in a quick and easy fix. Finally, literature confirms that those most likely to prefer the passive doctor or nurse directed approach and avoid active self-management of their own care are: the aged population and moreover those who have become accustomed to the medical model of care, especially those towards end of life (Kon, 2010; Levinson, Kao, Kuby, & Thisted, 2005) those with illnesses that are severe (Neeraj & McHorney, 2000), those from a lower socioeconomic environments, with lower educational levels, and from lower occupation levels (Chewning & Sleath, 1996; Levinson et al., 2005),

Other perceived barriers include the attitudes some health professionals have towards patient empowerment and to adopting a new paradigm of care, which can have an impact on the health professional's willingness and readiness to accept or endorse change (Anderson & Funnell, 2005). Funnell (2005) of the University of Michigan Medical School reports in her research that even though the new paradigm is readily accepted and endorsed by younger and more recently qualified practitioners,  many older – long-term health practitioners still hold firmly to the medical model of care, and are reluctant to change (Anderson & Funnell, 2005). McCann et al from the School of Nursing and Midwifery at Latrobe University concur, citing that less experienced staff were  more likely to show greater support for patient involvement

in treatment related matters than more experienced, and interestingly that female staff were more likely than male staff to support the same (McCann, Clark, Baird, & Lu, 2008). Conversely however, Fitzgerald (2007) finds that ageing nurses who are seeking positions they deem less onerous that would enable them to remain in the workforce, are more likely to accept and endorse a patient empowerment paradigm (Fitzgerald, 2007).

**Current teaching methodology**

Several teaching methodologies incorporating aspects of the previously discussed models are utilised in self-management education programmes. Research suggests that in order for self-management education to be effective, not only is it necessary for a number of different teaching methodologies to be employed, it is often necessary to combine components from more than one method simultaneously (Funnell et al., 2009). Health professionals who undertake training in chronic condition self-management have, on the whole, already undergone much study and education and have experience in their primary profession, and as such are adult learners.

Much research has been undertaken into the area of adult learning (Andragogy) and the teaching methodologies required. Six principles of adult learning directly influence the teaching methodologies utilised in the education of chronic condition self-management skills for health professionals. These principles, known as Knowles Adult learning principles, form the conceptual framework for the CCSMS program and are, therefore, presented here as the basis on which the effectiveness of the program can be judged. The principles are: Adults are internally motivated and self-directed; Adults bring life experiences and knowledge to learning experiences; Adults are goal oriented; Adults are relevancy oriented; Adults are practical; and Adult learners like to be respected (Clapper, 2010; Conlan, Grabowski, & Smith, 2003; Merriam, 2001; Murad, Coto-Yglesias, Varkey, Prokop, & Murad, 2010).

Furthermore in their review of the effectiveness of Self-directed learning (SDL) for health professionals, Murad et al (2010) found SDL not only improved knowledge gains, it was also found to improve health professionals skills and attitudes when compared with traditional didactic teaching methods (Murad et al., 2010).Life experiences also greatly influence how adults learn. Drawing on their own experience and self-reflecting on previously gained knowledge, adult learners demonstrate a greater understanding of curricula and a stronger ability to relate to the learning content. Conlan et al(2003) from the University of Georgia confirm this in their review of adult learning, citing that direct involvement and reflection of own life experiences brings with it greater retention and increased motivation to learn (Conlan et al., 2003). A further point linking adult learning principles with this project, a team from Texas Midwestern State University conducted a review of the literature available in nursing and healthcare databases, and found active learning plays a major role in effective CCSMS training, again fulfilling one of Knowles' adult learning principles "adults are practical" (Russell. A., Comello, & Wright, 2007).

**Current teaching modes of delivery**

Worldwide, several different courses that incorporate some or all of the theories of adult learning have been designed to educate health professionals in the principles of patient empowerment and self-management. In Western Australia for example, the Department of Health on-line report (2007) lists at least seven different self-management empowerment courses for both its employees and other health professionals, be they in community or private practice within the state. Six of these courses draw on the content of the principles found in the Flinders programme. Five require attendance at face to face, rigid classroom sessions ranging from one to three days in length, while the sixth, an alternative to the face to face course, involves an intense on-line 15 hour workshop programme, commencing on the same date of each month. This option requires participation in on-line discussion forums, and

completion of all the materials contained in the face-to face-version. The seventh option, based on the principles contained within the Stanford/Lorig model, is also conducted face to face in a classroom setting over two to three days, and aims to equip health professionals with the skills and attributes necessary to conduct training workshops for patient and community groups.

Similar programmes are conducted throughout Australia. The Early Intervention into Chronic Disease Management (EIiCDM) programme in Victoria is an example, where the focus is on early intervention and enhancing the capacity of patients to self-manage their condition. This programme draws on characteristics of, and also requires health professionals be educated and trained in, several aspects of the Wagner model, Flinders program, health coaching and motivational interviewing models (Taylor, Horey & Swierissen 2008(DHS Victoria, 2010). Analogous to Western Australia, health professionals attend didactic two or three day training course and or complete training packages in all aspects of patient empowerment and self-management to obtain accreditation in the principles of the programme.

Other Australian states and other countries also conduct similar courses to educate their health professionals in the principles of patient empowerment and self-management. In addition to the more generic courses, disease and condition specific courses for health professionals also exist. The Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) program is a more recently developed example. This course which was created to deliver patient self-management and empowerment education to people with type 2 diabetes and draws on the principles and models previously discussed (DESMOND 2008). To become an accredited DESMOND educator, health professionals are initially required to attend a two day didactic training course about the empowerment and self-care principles derived from the models of care previously mentioned. Once completed,

health professionals should be equipped to educate and empower their patients with the skills, abilities and knowledge to understand the impact of, and self-manage type 2 diabetes (DESMOND, 2008). To maintain accreditation in DESMOND, health professionals are required to complete on-going quality development programmes, attend regular educator study days, and deliver at least five DESMOND sessions to patients annually (DESMOND 2008).

Finally, improvements and advances in information technology have enabled more and more educational programmes, including the CCSMS program, to move to or incorporate an online delivery component. Online education has the potential to overcome many of the barriers to learning previously discussed, reach a wider audience, provide flexibility in teaching and learning, and enhance the availability of learning environments (Fieschi et al., 2002). The Australian Bureau of Statistics (2011) reports that as the costs associated with providing internet access and the costs associated with computing resources have decreased over the last decade. Furthermore the ABS also report that broadband access and internet connectivity is growing, with a 50 to 100% internet connectivity increase noted across Australia since the 2001 census, equating to greater numbers of Australian households now having improved access to information technology (ABS, 2011b). As a result greater numbers of students and potential students now have access to the online paradigm of learning.

**On-line learning**

On-line learning (e-learning) is increasing in popularity as many universities and corporations look to improve the cost effectiveness of delivering training and instruction (Smart & Cappel, 2006). Effective on-line learning programs contain aspects that are visually appealing, encourage participation, and incorporate activities that both support the learning objectives and maximise student engagement (McGuire & Castle, 2010). As with

other forms of education, strengths and limitations exist in on-line learning. This section summarises what the literature reveals about the strengths and limitations associated with online learning.

Recent evaluations conducted by Australian and international universities reveal a number of common strengths of on-line learning. Firstly the ability for students to take classes irrespective of where they live or what schedules they have (Helmi, 2001). Secondly unlike in face-to-face classroom situations, the asynchronous nature of online learning allows students time for reflection (Duncan-Howell, 2010). Thirdly the Illinois Online Network (ION) from the University of Illinois identify that the faceless nature of the medium provides no visual clues from other students or teachers that can otherwise influence the students learning (ION, 2010). Fourth the lack of the traditional teacher directed teaching approach promotes a student centred learning experience that requires the student to take greater responsibility for their learning. This can be seen as both a strength and a limitation (ION, 2010; Maryam, Alireza, Reza, & Azizollah, 2012).

As to limitations, accessibility remains an issue, with reliable and affordable internet and computer access amongst the weaknesses, particularly in rural and remote communities (Madden & Coble-Neal, 2003). Computer literacy is another major issue as students need the ability to navigate the internet, read and send email (McAlister, Rivera, & Hallam, 2001), and understand how to use computer based programs such as word in order to prepare and submit assignments. Furthermore the literature reveals that on-line learning is well suited to those students who are self-directed and are comfortable using both the internet and computers (Rodriguez, Ooms, & Montanes, 2008), while students without previous experience with online learning programs such as those offered via distance education may need to develop strong self-directed learning skills prior to commencing online education, in order to their learning and retention to be successful (Howland & Moore, 2002). As this can represent a

barrier to learning, Howland and Moore (2002) recommend students undergo a basic computer literacy course, or demonstrate basic computer skills as a pre-requisite for admission to an on-line education program.

Of the strengths and limitations that have been identified, access for people in rural and remote communities and the potential financial benefits for both educational institutions and students have been highlighted as being the most prominent in the literature. The remainder of this section will, therefore, discuss these two issues in some detail.

**Rural and remote – strengths and limitations of on-line learning**

There are many potential strengths and benefits e-learning can provide to health professionals in rural and remote locations throughout Australia as well as the rest of world. Online information provides rural and remote health professionals with access to professional development tools, peer support, and other online decision making tools. These tools not only assist with their regular work requirements but also enable access to additional training programmes that meet their learning and training needs (Chenoweth & Stehlik, 2002; Herrington & Herrington, 2006; NRHA, 2009). Furthermore online access allows health professionals and other consumers to overcome the disadvantages of distance by localising projects and training potentially eliminating the needs and expenses of travel to centralised major city locations (NRHA, 2009; Warren, 2007). Recent research suggests that the push by governments for provision of broadband access in rural and remote locations is enhancing interaction with online services by providing internet access for those who were previously unable (Galloway, 2007). For instance, Australia's National Broadband Network (NBN) is one such government infrastructure project that aims to empower and enable citizens from all over the country with the ability to access cheap, reliable and fast internet access (D. Lee, 2011). This has positive implications for online learning irrespective of where the student lives (Martin, 2010; Rennie, 2003).

Challenges to undertaking online education in rural and remote locations however are also well known. The literature reveals that internet reliability in rural and remote communities in both Australia and other countries around the world is a major challenge (Galloway, 2007; Martin, 2010; Moffatt & Eley, 2011), with internet drop outs, slow connection speeds, lack of suitable coverage and equipment breakdowns often hindering access and causing frustration for many internet users (Herrington & Herrington, 2006; McAlister et al., 2001; Rennie, 2003). Furthermore a lack of suitable and affordable internet access is evident in many remote locations.

**Financial benefits – Strengths and limitations**

Many universities and institutions around the world have implemented e-learning programs into their curriculums because of the potential financial benefits and cost savings they provide. For example, the Open University (London UK) cites the cost of running on-line courses to be 45% of those related to traditional on-campus courses (Appana, 2008; Marengo & Marengo, 2005). Appana (2008) suggests the incidence of online learning is increasing amongst students who cannot afford to attend traditional on-campus education as it is seen as a more financially viable option. Ruth (2006) reports that online learning has resulted in increasingly larger numbers of students, benefiting universities and institutions with subsequently greater enrolment revenues (Ruth, 2006).

Conversely financial limitations are also found. A recent cost benefit study conducted by the University of British Columbia found that start-up costs of online programs were often under anticipated and over budget (Appana, 2008), however although the costs associated with subsequent offerings of courses were found to decrease as improvements and adjustments were made (Appana, 2008). Similar findings were found in an earlier study by the University of British Columbia study, where start-up costs were substantially higher than anticipated, yet profits occurring after the third year of their program's operation (Bartolic-

Zlomislic & Bates, 1999). Online education programs may be proving to be a cost effective way of providing up to date information and education for health professionals, however economic, technology and social inhibitors remain, impacting unevenly on internet affordability and subscription (Madden & Coble-Neal, 2003). Particular attention is drawn to those who are socioeconomically disadvantaged, who tend to dwell in more rural and remote areas

**Evolution of the CCSMS program**

The CCSMS program evolved from the need to provide health professionals with the skills and attributes that would allow them to adopt the new paradigm of healthcare into their own practice. Creating a programme that would potentially overcome the barriers to learning previously discussed was of paramount importance. Subsequently an on-line delivery mode was selected as the most appropriate format for the program, as it not only meets the challenges presented by many of the barriers to learning, but has the potential to reach a much larger audience of health professionals than traditional classroom education. Rural or remote locations should not form barriers to learning in this program as it can be studied from the convenience and comfort of one's own home or workplace. As the National Broadband Network continues to roll out in Australia, problems with internet access, affordability and reliability for those in rural and remote communities should also be improved and potentially solved. Attendance at distant training courses is not required, thereby eliminating the financial impacts associated with travel, workplace absence, replacement staff and paid leave. Furthermore the program has been designed to be delivered in a cost effective manner that is considerably less expensive than the typical face to face, didactic programmes that currently exist

The on-line nature of the CCSMS programme is not without potential problems however. As previously mentioned Information Technology (IT) issues such as unreliable

internet access (which as technology improves is becoming less of an issue), computer breakdowns and a lack of personal knowledge on how to fix such problems, can be frustrating and negatively impact on a person's ability and willingness to participate in the program (Shank, 2009). Shank (2009) also reveals frustration leads to anxiety, a reduced ability to learn, and attrition. As the modules contained within the CCSMS program are self-paced, issues of poor motivation and procrastination can arise. A key work into the field of online learning finds that maintaining motivation and self-regulation can be problematic in the online learning environment (Rakes & Dunn, 2010). When compared to students in a classroom location, Rakes and Dunn (2010) found that as instructors are not physically present in the online learning environment students in this forum are predisposed to experienced greater difficulty maintaining motivation. This was attributed to the social isolation these students face, and the inability to receive instant support to solve technical issues if and when they occur (Rakes & Dunn, 2010).

The CCSMS programme draws upon the principles and methodologies contained in the models of care described and critiqued in this paper. Therefore, the structure and content of the CCSMS program, which has been specifically designed to be delivered solely on-line, is similar to the structure and content of the face-to-face CCSM programmes currently in use. The fundamental way in which the CCSMS program differs significantly from other face to face programmes is the convenience and flexibility offered in the way it is presented to students. Unlike other programs where a rigid schedule of classroom teaching activities is presented, this programme offers users the flexibility to complete the program at their own pace, to stop and start at any time with the option to pick up where they left off. The flexibility to complete the programme modules in any order, allows students to tailor their learning to their own personal interests and needs. Furthermore the programme has the

flexibility to be completed in the workplace, at home, or anywhere access to a computer and the internet are available.

The entire CCSMS package comprises of seven individual modules. Each module was purposefully designed to incorporate the  self-management and empowerment principles previous discussed (Wagner, Flinders, Stanford, motivational interviewing and health coaching models) while ensuring the principles of adult learning were met. The modules, which have been designed to be completed in isolation and or in any order, are as follows:

1. Module one - Client centred care. This module examines the philosophy of care held by health professionals. It then introduces the push for health reform which aims to place the patient at the centre care thereby having greater control over their own health care decisions.

 2. Module two - Communication skills. This module aims to improve communication between health care professionals and their patients. Learning objectives include: Using listening and questioning skills, interviewing techniques and recognising non-verbal behaviours.

3. Module three- Assessment skills. This module examines ways of understanding what skills a patient already has and what areas they need to address in order to successfully self-manage their condition. It also provides health professionals with the skills they require to assess a patient's capacity for self-management.

4. Module four - Behaviour change techniques. This module examines and teaches the health professional techniques that assist their patients to modify aspects of their behaviour in order to better manage and improve their health.

 5. Module five - Collaborative care planning. Shows health professionals how to help patients facilitate the choices they have actively made in caring for their own health.

6. Module six - Self management in Diverse Groups. Aims to show health professionals how to be attentive, culturally sensitive and respectful to ethnic and indigenous members of society and the ways in which health care services can be structured to meet their needs.

7. Module seven - Evaluating self-management. Presented in this module is practical advice on how to evaluate the effectiveness of a self-management program.

Registration for the program involves logging in to the CCSMS webpage, typing in an existing email address, and setting a password. Once access is granted (immediately), the program opens a home screen that is personalised to the user.

Each module of the CCSMS program contains of a combination of learning tools and styles. In keeping with good practice (Koeckeritz, Malkiewicz, & Henderson, 2002) written information, audio-visual materials, graphic materials, and other learning activities are available. (Koeckeritz et al., 2002). Throughout each module, a series of self -reflections, learning activities and multiple choice statements are used to stimulate student knowledge and understanding. These follow either written information or a video vignette. Literature reveals that video vignettes (and multimedia) help students increase the likelihood of meeting their learning needs. By presenting real life experiences, video vignettes allow students to relate with the subject matter and develop an understanding of what is being taught. It is anticipated students will find similarities with their own personal experience and ultimately apply what they have learned to their own practice (Abrami, Bernard, Bures, Borokhovski, & Tamim, 2011; Koeckeritz et al., 2002).

Student responses to the reflections receive an immediately "expert response" to their answers, while the learning activities and questions are assessed immediately following completion and feedback about incorrect answers provided. At this point students are given three opportunities to review the video vignettes and provide the correct answers. It is evident

from the literature that immediate feedback in the e-learning is important (P. Chen, Lambert, & Guidry, 2010). A 2005 study into students' acceptance of internet based learning found immediate feedback offers students the opportunity to correct misunderstood materials and enhance both usage and understanding of the learning materials (M. Lee, Cheung, & Chen, 2005).This feedback was also found to help students understand their own learning, foster self-regulation and reflection, enhance motivation and foster engagement with the program or course, enhancing their performance (K. Chen & Jang, 2010; Jonas & Burns, 2010; M. Lee et al., 2005). Motivation is an important factor of any education program, especially in online learning (K. Chen & Jang, 2010; Lim, 2004). Lim (2004) identifies six factors that enhance motivation in the online environment: Reinforcement, course relevance, interest, self-efficacy, affect and learner control (Lim, 2004)

Finally, fidelity is an important aspect of any program that is delivered more than once. The fidelity of a program is used to assess whether a program has remained true to its original intent and that the content taught is the same for every participant or student. Face-to- face programs tend to acquire reduced fidelity as certain delivery styles and personalities of the lecturers, tutors or presenters may result in slight differences in delivery and interpretation of program content (Johnson, Mellard, Fuchs, & McKnight, 2006). Furthermore, as such programs evolve over time, subtle changes tend to occur, invariably impacting on the program's content. For example, in a 2006 study conducted by the Department of Public Health and Endocrinology at Yale University, program fidelity was found to diminish over time with each subsequent interpretation and presentation of a program (Bradley, Webster, Schlesinger, Baker, & Inouye, 2006). The CCSMS program is designed to avoid any impact on fidelity as the original program content cannot be altered. As such the program is presented in exactly the same manner to each and every participant every single time.

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**This research project**

The need to provide health professionals with an accessible, cost effective education package in patient empowerment principles, and the need to overcome the barriers associated with health professional learning, has meant alternative methods of providing education needed to be sought. Delivery of the CCSMS package in Australia in an on-line mode  has been determined to be the most appropriate method of delivery that overcomes many of the barriers discussed in the previous section (P. Chen et al., 2010; Glaister, 2010a, 2010b).

This evaluation examines the process of CCSMS implementation and the potential impact it has on participant's attitudes and confidence.  Process evaluation reviews the program's capacity to support the learning and functional aspects of participants throughout the seven modules, while impact evaluation examines the changes in attitude towards and confidence in CCSMS following completion of the program.

**Process evaluation.**

Process evaluation fulfils the need for information on program implementation by examining how a program succeeds or fails in achieving its goals. Dehar, Casswell and Duigan (1993) highlight two important uses of process evaluation; 1– To assist the interpretation of program outcomes, and 2 – To inform future efforts in similar areas (Dehar, Casswell, & Duignan, 1993). More recent research publications concur; also highlighting the importance of process evaluation.  A Centres of Disease Control (CDC) report from 2000, emphasises the importance process evaluation plays in investigating how effectively a program is delivered (Thompson & McClintock, 2000), while a 2005 study conducted by the University of South Carolina underlines process evaluation as an important and valuable component that can facilitate understanding of the relationships between specific program

elements and program outcomes (Saunders, Evans, & Joshi, 2005). Process evaluations highlight potential areas of the program content and structure that may need to be changed or rectified. This ensures participants can interact effectively with the program content thus ensuring its useability for the purpose in which it was designed (Thompson & McClintock, 2000). Process evaluation of the CCSMS program explores participant interaction with the content of each module, the suitability and useability of the module's teaching components, and participant ability in and comfort with using the learning tools.

**Impact evaluation.**

As with process evaluation, impact evaluation has an equally important role in the evaluation of any educational program. Evidence found in a review of the available literature suggests that misunderstandings and confusion has occurred with the meanings of the terms Impact Evaluation and Outcome Evaluation (White, 2010). For the purposes of this report, the term Impact evaluation will be used to indicate the immediate changes and impacts as reported above. While not the aim of this project, Outcome evaluation seeks to identify if the ultimate goal of the program has been achieved which, in this case, would be for students to use the CCSMS principals in clinical practice (Jordan & Osborne, 2007).

By examining the immediate effect a completed program has on the participant, impact evaluation helps to determine what parts of the program have worked, and what parts have not and whether the program objectives have been met (Talbot & Verrinder, 2010). Furthermore impact evaluation determines what changes have occurred in participant knowledge and understanding of the topic as a direct result of the program content. A great deal of research investigating impact evaluation exists. An example, is the 2007 report conducted on behalf of the Health Communication Unit of the University of Toronto which cites impact evaluation as an essential component of any program evaluation as it is used to gauge the immediate influence the program had on the participants and stakeholders (Van

Marris & King, 2007). Impact evaluation for this project examines changes in participant attitudes towards and confidence in patient empowerment and self-management and how the CCSMS program has influenced a participant's knowledge and understanding of CCSMS.

The first review of the international literature that was undertaken at the commencement of this project in 2011 revealed that the CCSMS program was possibly the first of its type to be implemented anywhere in the world. Subsequent repeated reviews have identified that other similar programs have since been developed, both in Australia and elsewhere. One such program, the "Supporting chronic disease self-management" (SCDSM) online training package, developed in 2011 for Australia's "Heart Research Centre", was translated from the their  existing face to face SCDSM  program with the aim of improving Chronic Disease Self-management skills in a wider range of clinicians (Higgins & Murphy, 2011). To the authors knowledge this is the only program that has been formally evaluated and reported in the international literature. Despite the fact that the CCSMS program is now being used widely throughout Australia, there has, to date, been no formal evaluation of it.

**Summary**

Improvements in the standard of living and increased life expectancies have seen an increase in the incidence and prevalence of chronic diseases, resulting in an unprecedented burden on health care. Burdens associated with chronic conditions not only impact on the person, but also their families and society. Traditional medical treatments that focus on acute conditions have proven ill equipped to manage chronic conditions. Alternative treatment methods have been sought; and empowering patients with the ability to self-management their conditions identified as the most effective way of managing the complex nature of chronic conditions. Self-management empowerment has been linked to improvements in compliance with medications and interventions, health outcomes, quality of life and a reduction in health service utilisation and expenditure. Subsequently the needs for a paradigm

shift away from the traditional model of care and the education/ re-education of health professionals were identified.

In order to provide health professionals with the skills and attributes necessary to educate patients in the principles of self-management, several different education programs and models of care, each with their own strengths and weaknesses, have been developed. However, even with the most successful programs, barriers preventing health professionals from engaging in this education / re-education have been identified. Financial and economic constraints, insufficient staff resources, inflexible working hours, inaccessible training locations, and inflexible classroom type training sessions all figure prominently as barriers.

Online learning has been offered as a solution to overcome many of the barriers mentioned. It is proving to have great flexibility, to provide improved and easier access, and to be a more cost effective option. With this in mind, the CCSMS programs was developed with the aim of reaching larger numbers of health professionals, and provide them with education on the principles of patient empowerment and self-management.

# Chapter 3 Methodology

## Study objectives

The aim of this study is to determine the effectiveness of the CCSMS package, its on-line delivery mode, and determine its value as an educational resource. The objectives of this investigation are:

- To determine the influence participant characteristics have on users' perceived effectiveness of the CCSMS resource module.

- To determine the influence existing information technology skills have on users' perceived effectiveness of the CCSMS resource module.

- To determine the impact of the CCSMS resource module on the attitudes of health professionals towards practicing CCSMS.

- To determine the impact of the CCSMS resource module on the confidence of health professionals in applying CCSMS in their practice.

## Study design

This study was a process and impact evaluation of an educational module, designed to increase health professionals understanding of and skills in patient chronic disease self-management. The Chronic Condition Self-Management Support (CCSMS) programme was created with the aim of embedding self-management support principles into ADEA accredited postgraduate diabetes education and management courses. The CCSMS programme was originally developed and piloted in 2009-2010. Following completion of the pilot program in March/April 2010 any errors or functional issues were addressed. The current version of the CCSMS programme was then launched into the curriculum of the five Australian universities that currently host the ADEA accredited Diabetes education courses.

Given the programme is an entirely on-line education package that cannot be altered by anyone other than its creator, each participating student received identical program content and pre-recorded materials that were delivered in an identical manner across each site. No individual interpretation by the different lecturers and tutors across the different university sites was possible, ensuring both the fidelity of the programme and the purpose for which it was designed. Full utilisation of the program commenced in Semester Two of the 2010 academic year across each of the five sites. The collection of pre and post programme evaluation data commenced at that time, and was continued up until the beginning of May 2012 when the data was accessed, thus allowing for at least four consecutive semester periods of student data to be included in this research project.

Students were asked to voluntarily complete on-line surveys before and after undertaking the CCSMS programme. The pre survey included demographic information, and asked participants about their attitudes to chronic disease self-management and their confidence in providing appropriate support. The post survey asked participants to rate various characteristics of the CCSMS programme, as well as repeating the questions about attitudes to self-management and confidence in giving support. Details of the specific instruments used and how they were created follows in section 3.4.

**Participants and setting**

The population of interest was a group of students enrolled in the CCSMS programme at either Curtin University in Western Australia, Deakin University and Mayfield Education in Victoria, Flinders University in South Australia, or the University of Technology Sydney (UTS) in New South Wales between July 2010 and May 2012. There were 1609 students in total; 1,279 undergraduate and postgraduate level nursing students, and 330 postgraduate

diabetes education students. It is the 330 diabetes education students that form the basis of the sample in this study. There were several international, offshore nursing students completing the programme as part of their studies in addition to students from within Australia. A number of different health disciplines were represented in the sample.

**Ethical considerations**

Approval to conduct this study was sought and granted by the Human Research Ethics Committee at Curtin University approval (Appendix 1 pursuant to guidelines recommended by the National Health and Medical Research Council (NHMRC) All post-graduate students of the CCSMS module were given the opportunity to participate, with the pre survey (Appendix 2) and the post survey (Appendix 3) built into the CCSMS programme. All students were advised that participation in the survey was totally voluntary, and that they could opt out at any time, without that decision affecting their study program.

Anonymity of participants' records was maintained through the automatic allocation of a study number to each participant record on their entry into the programme. Participants accessed the programme using an email address and password of their own choice; the same was used to gain access to the programme as required. No identifying details of any of the participants were recorded, with linkages between email addresses, study numbers and surveys not available or accessible. Following completion of the study, the survey results will be held in a secure database and will be held for the required period of five years, after which time they will be deleted.

**Procedure and Measures used in the study**

An on-line survey developed by a team of experts as outlined below, was employed to collect  purely quantitative data both immediately prior to commencement, and immediately following completion of the CCSMS programme. The strengths and limitations associated with this form of data collection will be discussed in chapter 5.

All students were given the choice to complete both pre and post surveys. Consent to use the data collected was obtained with students commencing the surveys. The pre survey (Appendix A) consisted of three sections. Section one collected participant demographic information and a further sub-set of questions sought information on participant's prior experience with other on-line programmes and information about their confidence in using both computers and the internet. Section two which was adapted from the University of Michigan Diabetes Attitude Scale (DAS-3) sought information on the participants' attitudes towards CCSMS. Section three consisted of a series of questions purposely developed for this research, examining participants' confidence in CCSMS.

The post survey (Appendix B) was presented on completion of the CCSMS programme consisted also of three sections. The first was purpose designed to measure participants' overall satisfaction with the programme and covering aspects of each of the seven learning modules, while sections two and three were identical to the pre-survey sections two and three, covering questions relating to participants' attitudes and confidence at completion of the programme. Detailed information about the instruments is provided in Section 3.5.

Data and results for both surveys were captured in the on-line Equihost system (http://ccsms.equihost.com), where the CCSMS system is accessed. Data collection commenced in July 2010, after the pilot trial was evaluated, and continued until June 2012, allowing for up to four consecutive semesters periods of data collection.

The questions in all sections of the evaluation surveys were developed by the CCSMS project team. The team comprised ADEA course coordinators from the five universities, Diabetes nurse practitioners, professors and scholars from the five universities, an internationally renowned professor of rural health, an anthropologist, and a health psychologist. The validity of both the pre and post surveys was tested during the pilot

programme. Validation was undertaken by a review group comprising of at least six participants; three representing the Diabetes Education Course Coordinators from the participating universities, and three representing the ADEA Course Accreditation Committee.

**Pre survey (Appendix A).**

*Section One: Demographic information and prior experience.*

Demographic information comprised: gender, age, current health profession occupation, time in current occupation, if the working in a chronic care area, time spent working in chronic care, workplace type (hospital, clinic, community health, Aboriginal health service, division of General Practice), and workplace location (urban, rural, and remote). Further questions regarding current course, university attended, and level of course completed this section of the survey.

One question was asked in section one of the pre survey to determine if participant students have had prior experience with on-line learning. Here a simple yes no question was asked. Two further questions regarding the student's confidence using both computers and the internet followed. Each used a 5 point Likert scale, with 1 being not at all confident, and 5 being totally confident.

***Section Two: Attitudes toward CCSMS.***

The Michigan Diabetes Attitude Scale (DAS-3) was initially developed through the collaboration of several eminent scholars at the University of Michigan medical School, the Michigan Diabetes Research & Training Center, in collaboration with the Kluge Children's Rehabilitation and the University of Virginia in the late 1970's. Its development was in response to a report from the US congress suggesting the attitudes of health care professionals towards diabetes were inappropriate and could lead to negative health outcomes for their patients (Anderson, Donnelly, Gressard, & Dedrick, 1989). Since that time the DAS has been reviewed and refined, reducing the numbers of questions contained in the survey to a level deemed more manageable and appropriate (Anderson, Fitzgerald, Funnell, & Gruppen, 1998). The current version 3 emerged in 1998 and remains in use throughout the world. The revised DAS consists of the following set of subscales: 1) *the need for special training in education; 2) seriousness of type 2 diabetes; 3) the overall value of tight glucose control in diabetes care; 4) psychosocial impact of diabetes on patients; and 5) attitude towards patient autonomy* (Anderson et al., 1998).

With permission granted by the owners of the DAS-3 (Anderson et al., 1998), statements in two of the DAS-3 subscales '*the need for training in education'* and *'attitude towards patient autonomy'* were adapted for use in this evaluation. Thirteen statements were created for this section, each employing a five point Likert scale to measure student responses to the statements. The scale used ranges from 1 – strongly disagree through to 5 – strongly agree. For analysis purposes, the statements were grouped into two categories of correlating statements. The first comprising of seven questions, measured the student's attitudes towards the rights of the patient. The second, containing the remaining six questions, measured the students attitudes towards additional health professional training needs.

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### *Section Three: Confidence in CCSMS.*

Section three consisted of 10 statements, each purposely designed by the creators of the programme for the collection of data that would examine the participants' confidence in CCSMS. A five point Likert scale was employed to measure student responses to each statement. The scale used ranged from 1 - not at all confident through to 5- totally confident. Again for analysis purposes, the 10 statements were grouped into correlating topics, resulting in the creation of three variables. The first; confidence in CCSMS ideology, consisted of five similar statements; the second; Confidence assessing patient readiness for CCSMS consisting of two similar statements, and the third; Confidence in assisting patients to adopt CCSMS, the remaining three statements.

### **Post survey (Appendix B).**

### *Section One: Participant's overall satisfaction.*

This section is divided into two subsections; the first 'about the programme' consisted of seventeen questions, each employing a five point Likert scale ranging from 1 – Never, through to 5 –Always, to examine the CCSMS programme effectiveness. For analysis purposes, the questions in this subsection were grouped into three sets of similar subject matter; the first 'visual effectiveness' consisted of five questions, the second 'promoted CCSMS understanding' contained six questions, and the third set 'technical appropriate resources' contained the final six questions.

Subsection two contained seven questions, each relating to one of the seven CCSMS programme modules, and each designed to measure the quality of that module. A five point Likert scale ranging from 1 - Very poor through to 5 – excellent was employed to assess perceived satisfaction with each module.

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***Section Two: Attitudes toward CCSMS.***

Using the identical questions asked in section two of the pre survey, participant attitudes towards patient rights, and attitudes towards additional health professional training requirements were measured. Using the same questions, containing the same 5 point Likert scale allows for a meaningful comparison of data to occur during the analysis stage.

***Section Three: Confidence in CCSMS.***

Identical questions to those used in the pre survey section three were used in this section. Again utilising the same instruments, using the same Likert scale measurements, allows for a meaningful comparison of pre and post programme data during the analysis stage of this project.

**Statistical analysis**

Data collection occurred in the platform used to host the on-line CCSMS programme. The data was subsequently extracted in Microsoft Excel (Excel 2010) format, merged and uploaded into the statistical package SPSS version 19 (IBM, 2011).

Data cleaning was undertaken initially to remove any undergraduate or other than Diabetes Educator student details. Data was encoded to reflect student type and course type. Those who did not fall into a Health Professional studying a post graduate certificate in Diabetes education and Management were removed, ensuring the target population was maintained. This included the undergraduate students studying health related courses in which the CCSMS programme was being trialled and post graduate students studying other courses. Following this process, the data was ready to use for this analysis.

Dependant, independent, continuous and categorical variables were first determined.
Several conversions and derivations were deemed necessary to ensure the data was in a more
appropriate form for data analysis. Independent categorical variables derived from the
changes were: Student age, – which was converted into the following 5 categories; up to 24
years; 25 – 34 years; 35 – 54 years; 55+ years; and not reported. Occupation, - consisting of
the following 4 categories; Registered Nurses, Aboriginal Health Workers, Dietitians, and all
other. Time in occupation was converted into the following 5 categories; Up to one year, 2 –
4 years, 5 – 9 years, 10 years + and not reported.  Time working in a chronic area, -
transformed into 5 categories; Not working; up to one year; 2 – 4 years; 5 years +; and not
reported. Workplace type,-  became 4 categories; Hospital,; Community Health; Aboriginal
Health Service; Division of GP and other. Remaining independent categorical variables;
Gender; working in chronic area; and location of work did not require and changes or
conversions.

The dependant continuous variables used to measure student responses for sections
two and three of the pre and post surveys did not require data transformation; however for the
purpose of result interpretation, the difference scores obtained once the pre results had been
subtracted from the post results were transformed into three categories; negative, neutral and
positive. Descriptive statistics were calculated in order to examine the characteristics and
demographics of the participants who completed the pre survey only and those who
completed both the pre and post surveys.

Data analysis assumes a normal distribution, yet initial inspection of the results
obtained for sections two and three of both surveys, revealed the data to be negatively
skewed. Reflected square root transformations of the data were undertaken with the view of

correcting this, however subsequent analysis of both the transformed data and untransformed data yielded similar results; therefore this level of complexity was not included or added to the data analysis. Furthermore, given the similarity or both results, the possibility of Type I or Type II errors relating to the assumption of normality is unlikely. Moreover supporting this assumption is the post hoc power score of 0.89, which, based on a sample size of 180 and an effect size of 0.30, supports the reduction in the possibility of a Type II error, the acceptance of a false null hypothesis occurring.

T tests and one way ANOVA tests with Bonferroni corrections applied were used to investigate if any relationship was found to exist between the participant's characteristic independent variables and the difference score results of the pre / post survey attitude and confidence dependent variables. The Bonferroni correction was employed to control the probability of committing Type I errors

Several of the difference score attitude variables and the confidence variables were combined to help simplify statistical analysis. Section 2 attitude questions were grouped into two subcategories; "Attitude to patient's rights" and "Attitude to Health Professionals additional training requirements". The internal consistency of each of these subcategories was measured using Cronbach's alpha..

The section three confidence questions were grouped into three subcategories: "Confidence in CCSMS ideology", "Confidence in assessing patient readiness for CCSMS" and "Confidence in assisting patients to adopt CCSMS". Chi square and One way ANOVAs with Bonferroni corrections were undertaken to investigate the relationships between participant characteristics (independent) variables and the sub scaled participant attitudes and confidence (dependant) variables.

# Chapter 4 Results

## Introduction

Results are presented in this section under the following headings: Response rate, Demographic and workplace characteristics of participants compared with non-participants; Prevalence of participants demographic and workplace characteristics, and experience with computers and information technology; Response and difference scores for pre and post attitude and confidence CCSMS statements; Response and difference scores for pre and post attitude and confidence CCSMS total scores; Response scores for program effectiveness and quality; Bivariate relationships between participant characteristics and program effectiveness and module quality; and Bivariate relationships between participant characteristics and attitudes and confidence in CCSMS.

## Response rate

Data collection was completed in June 2012. At this time, 330 diabetes education students had completed both the CCSMS program evaluation and the pre-program survey. Of these, only 180 students chose to fully participate and also complete the post program survey, resulting in a response rate of 55%. For the purposes of this evaluation, the remaining 150 students have been classified as non-participants.

## Demographic and workplace characteristics of participants vs. non-participants.

Table 4.1 present the prevalence's of demographic and workplace characteristics of both participants and non-participants.

**Table 4.1**
**Characteristics of the participants and non-participants**

| Characteristic | Participant | | Non-participant | |
|---|---|---|---|---|
| | n | % | n | % |
| **Gender** | | | | |
| Female | 165 | 91.7 | 135 | 90.0 |
| Male | 15 | 8.3 | 15 | 10.0 |
| **Age** | | | | |
| ≤ 24 years | 17 | 9.4 | 15 | 10.0 |
| 25 – 34 | 49 | 27.2 | 51 | 34.0 |
| 35 – 54 | 52 | 28.9 | 32 | 21.3 |
| 55 ≥ years | 48 | 26.7 | 38 | 25.4 |
| Not reported | 14 | 7.8 | 14 | 9.3 |
| **Occupation** | | | | |
| Registered Nurses | 145 | 80.6 | 125 | 83.3 |
| Dietitians | 16 | 8.9 | 12 | 8.0 |
| Aboriginal Health Workers | 11 | 6.1 | 2 | 1.3 |
| Others | 8 | 4.4 | 11 | 7.4 |
| **Working in a chronic health area** | | | | |
| Yes | 71 | 39.4 | 59 | 39.4 |
| No | 86 | 47.8 | 88 | 58.6 |
| Not reported | 23 | 12.8 | 3 | 2.0 |
| **Time spent working in chronic area** | | | | |
| Not working in a chronic area | 107 | 59.4 | 90 | 60.0 |
| Up to one year | 18 | 10.0 | 10 | 6.7 |
| 2 - 4 years | 34 | 18.9 | 33 | 22.0 |
| 5 years + | 21 | 11.7 | 17 | 11.3 |
| **Workplace type** | | | | |
| Hospital | 94 | 52.2 | 85 | 56.7 |
| Community Health | 42 | 23.3 | 33 | 22.0 |
| Division of GP and Other | 33 | 18.4 | 27 | 18.0 |
| Aboriginal Health Service | 11 | 3.3 | 5 | 3.3 |
| **Workplace location** | | | | |
| Metropolitan | 90 | 50.0 | 99 | 66.0 |
| Rural | 75 | 41.7 | 44 | 29.3 |
| Remote | 15 | 8.3 | 7 | 4.7 |
| **Completed other online courses** | | | | |
| Yes | 73 | 40.6 | 44 | 29.3 |
| No | 105 | 58.3 | 102 | 68.0 |
| Not reported | 2 | 1.1 | 4 | 2.7 |

**Prevalence of participant's demographic and workplace characteristics, and experience with information technology and computers**

Table 4.2 presents the prevalence of participants demographic and workplace characteristics and experience with computers and information technology. A review of the data contained in the table reveals the following:

The dominant gender among participants is, female, (91.7%). Age range is from less than 24 years to over 55 years, with the largest cohort (28.9%) coming from the 35 - 54 years span. Nursing is the dominant occupation (80.6%), followed by dietitians (8.9%), Aboriginal Health Workers (6.1%), and all others (4.4%). The majority of participants (47.8%), had not and were not working in chronic care (59.4%); were located in a metropolitan area (50.0%); and worked in a hospital setting (52.2%). Many participants (58.3%) reported having no prior experience using computers and information technology to complete other on-line programs.

**Table 4.2**

**Prevalence of participants demographic and workplace characteristics, and experience with computers and information technology**

| Characteristic | % |
| --- | --- |
| **Gender** | |
| Female | 91.7 |
| Male | 8.3 |
| **Age** | |
| ≤ 24 years | 9.4 |
| 25 – 34 | 27.2 |
| 35 – 54 | 28.9 |
| 55 ≥ years | 26.7 |
| Not reported | 7.8 |
| **Occupation** | |
| Registered Nurses | 80.6 |
| Dietitians | 8.9 |
| Aboriginal Health Workers | 6.1 |
| Others | 4.4 |
| **Working in a chronic health area** | |
| Yes | 39.4 |
| No | 47.8 |
| Not reported | 12.8 |
| **Time spent working in chronic area** | |
| Not | 59.4 |
| Up to one year | 10.0 |
| 2 - 4 years | 18.9 |
| 5 years + | 11.7 |
| **Workplace location** | |
| Metropolitan | 50.0 |
| Rural | 41.7 |
| Remote | 8.3 |
| **Workplace type** | |
| Hospital | 52.2 |
| Community Health | 23.3 |
| Division of GP and other | 18.4 |
| Aboriginal health Service | 3.3 |
| **Experience using computers / IT to complete other on-line programmes** | |
| **Yes** | 40.6 |
| No | 58.3 |
| Not reported | 1.1 |

**Response and difference scores for pre and post attitudes toward CCSMS; statements**

Tables 4.3 presents the list statements found in the pre and post surveys, their

corresponding derived attitude statements, and the observed response scores.

**Table 4.3**
**Response and difference scores for pre and post attitude toward CCSMS**

| Statement: (Cronbach's α) Variable | Pre Survey Mean (St Dev) | Post Survey Mean (St Dev) | Difference score |
|---|---|---|---|
| **Attitude to patient rights** | **(.836)** | **(.897)** | |
| 1. Important decisions about chronic conditions should be made by the person with the condition. | 4.17 (0.84) | 4.51 (0.97) | 0.34* |
| 2. People with chronic conditions should have the final say in setting their health goals. | 4.42 (0.72) | 4.45 (0.99) | 0.03 |
| 3. The person with the chronic condition is the most important member of the health care team. | 4.61 (0.70) | 4.62 (0.96) | 0.01 |
| 4. People with chronic conditions should learn about the disease so they can better take charge of their own care. | 4.19 (0.88) | 4.08 (1.07) | -0.11 |
| 5. Patient self-care is effective yet they find it frustrating. | 4.03 (0.96) | 3.39 (1.23) | -0.64* |
| 6. People with chronic conditions have the right to choose how hard they will work to self-manage their conditions. | 4.14 (0.92) | 4.23 (1.07) | 0.09 |
| 7. People with chronic conditions have the right not to take good care of themselves. | 3.61 (1.09) | 3.74 (1.24) | 0.13 |
| **Attitude to Health professional's additional requirements** | **(.903)** | **(.945)** | |
| 1. Health professionals should help patients make informed choices about their care | 4.64 (0.71) | 4.51 (.95) | -0.13 |
| 2. Health professionals should be trained to communicate effectively with people who have a chronic condition | 4.82 (0.53) | 4.57 (1.03) | -0.25* |
| 3. Health professionals should be taught to assess how a chronic conditions affects individuals lives | 4.74 (0.64) | 4.49 (1.02) | -0.26* |
| 4. Health professionals need to learn counselling skills in order to work with people who have chronic conditions | 4.42 (0.84) | 4.36 (1.03) | -0.06 |
| 5. Health professionals should learn how to set goals with patients, not just tell them what to do | 4.75 (0.72) | 4.53 (1.04) | -0.22* |
| 6. Health professionals should learn how to assist individuals to change their behaviour | 4.48 (1.10) | 4.37 (0.79) | -0.11 |

* Statistically significant at *p < .05*

Mean scores in Table 4.3 are very high on the scale of 1 to 5 with the exception of statement 7 at 3.61, indicating fewer participants agreed with this particular statement. Standard deviations were mainly centred on 0.8 for the pre and post results indicating that approximately 68% of respondents recorded a 3, 4 or 5 on the 5 point Likert scale. Analysis employing a two tailed paired sample *t* tests revealed several statistically significant findings among the variables.

**Attitude to patient rights.**

The difference scores of the variables in the statement "Attitude to patient rights" in table 4.3 revealed several positive and negative changes in participant attitude, following completion of the CCSMS program. Question one relating to patients making decisions, recorded the only statistically significant positive difference score of 0.34 ($p < .001$). In contrast, question five, recorded a negative difference score (-0.64) that was found to be statistically significant ($p < .001$) confirming a worsening in participant attitude. Question four relating to learning about the disease in order to take better control, was the only other to have a negative difference score (-0.11), which was not statistically significant.

**Attitude to health professional's additional requirements.**

Difference scores observed in table 4.3 for the variables in the statement "Attitude to health professional's additional requirements" were all found to be negative, indicating that participant agreements with each variable and therefore attitude, decreased following completion of the CCSMS program. Firstly, with a difference score of -0.25, participant attitudes to "health professional need to be trained to communicate effectively", were found to decrease following completion of the program ($p < .01$). Secondly, with a difference score of -0.26, attitudes to "health professionals need to be taught to assess", also decreased

(p<.001). Thirdly, with a difference score of -0.22, attitudes to variable 5 "health professionals needing to learn goal setting", were also found to decrease (p<.01).

**Response and difference scores for pre and post confidence in CCSMS; statements**

Tables 4.4 presents the list statements found in the pre and post surveys, their corresponding derived confidence statements, and the observed response scores.

**Table 4.4**
**Response and difference scores for pre and post confidence in CCSMS statements**

| Statement: (Cronbach's α) Variable | Pre Survey Mean (St Dev) | Post Survey Mean (St Dev) | Difference score |
|---|---|---|---|
| **Confidence in CCSMS ideology** | **(.812)** | **(.900)** | |
| 1. Awareness of my own philosophy of care. | 3.69 (0.75) | 3.90 (0.93) | 0.21* |
| 2. Understanding and communicating with different cultural groups. | 3.22 (0.88) | 3.52 (0.90) | 0.30* |
| 3. Interpreting non-verbal forms of communication | 3.44 (0.79) | 3.82 (0.94) | 0.38* |
| 4. Using communication techniques like reflective listening, open ended questions and paraphrasing | 3.51 (0.78) | 3.86 (0.92) | 0.35* |
| 5. Using strategies or skills to support behavioural change. | 2.97 (0.84) | 3.72 (0.86) | 0.75* |
| **Confidence assessing patient readiness for CCSMS** | **(.841)** | **(.899)** | |
| 1. Assessing patient's self-management capability | 3.32 (0.75) | 3.72 (0.87) | 0.39* |
| 2. Assessing of a patient's readiness, confidence and importance For behavioural change | 3.31 (0.76) | 3.75 (0.89) | 0.44* |
| **Confidence assisting patient to adopt CCSMS** | **(.817)** | **(.863)** | |
| 1. Assisting patients to identify and solve their own problems | 3.29 (0.75) | 3.79 (0.86) | 0.50* |
| 2. Assisting patients to develop SMART goals and individualised action plans | 3.07 (0.92) | 3.82 (0.89) | 0.74* |
| 3. Engaging in collaborative care planning with the patient and other health professionals | 3.58 (0.89) | 3.98 (0.94) | 0.40* |

* Statistically significant at *p < .05*

Mean scores are high across most statements, with standard deviations averaging 0.8 and higher in both surveys, demonstrating that approximately 68% of survey respondents recorded a 3, 4 or 5 in the 5 point Likert scale. Statistically significant results were detected

in each variable of the confidence statements; with positive difference scores indicating an increase in participant confidence post completion of the CCSMS program.

### Confidence in CCSMS ideology.

With a statistically significant difference score of 0.21 *(p < .01)*. Table 4.4 reveals participant confidence in variable one "Awareness of my own philosophy of care" was found to improve following completion of the program.

Participant confidence in variable two "Understanding and communicating with different cultural groups", was also found to improve following completion of the CCSMS program, with a statistically significant difference score of 0.30 ($p < .001$) recorded.

Confidence in variables three "Interpreting non-verbal forms of communication" improved following completion of the program, with a statistically significant difference score of 0.38 ($p < .001$) revealed.

Confidence in variable four "Using communication techniques like reflective listening, open ended questions and paraphrasing", was found to have also improved after completion of the program, recording a statistically significant difference score of 0.35 ($p < .001$).

Variable five "Using strategies or skills to support behavioural change", recorded the largest statistically significant difference ($p < .001$), with a score of 0.75, Participant confidence in using the strategies and skills to support behaviour change clearly increased as a direct result of completing the CCSMS program.

**Confidence assessing patient readiness for CCSMS.**

As demonstrated in table 4.4, and similar to the previous statement, both variables contained in this statement recorded improvements in levels of confidence following completion of the program, and statistically significant increased change scores.

Completion of the program saw participant confidence in variable one, "assessing patient's self-management capability" increase, recording a statistically significant difference score of 0.39, ($p < .001$).

Variable two, "assessing of a patient's readiness, confidence and importance for behavioural change" recorded a statistically significant difference score of 0.44 ($p < .001$), indicative of improved participant confidence in this statement after completion of the program.

**Confidence assisting patient to adopt CCSMS.**

The final three variables that make up this statement, also recorded statistically significant and positive difference scores, confirming improved participant confidence in the questions following program completion.

Participant confidence in variable one "Assisting patients to identify and solve their own problems"; significantly improved ($p < .001$), recording a difference score of 0.50.

Variable two "Assisting patients to develop SMART goals and individualised action plans"; saw the largest participant confidence increase of this statement (p<.001), with a difference score of 0.75.

Variable three "Engaging in collaborative care planning with the patient and other health professionals"; recorded a positive difference score of 0.40, again confirming increased confidence with this question among participants (p<.001).

**Response and difference scores for pre and post attitude and confidence in CCSMS: Total scores**

Table 4.5 presents both the mean and standard deviation for the total scores in each derived variable, and the difference scores in each derived variable.

**Table 4.5**
**Response and difference scores for pre and post attitude and confidence in CCSMS: Total scores**

| Statement: | Pre Survey Mean (St Dev) | Post Survey Mean (St Dev) | Difference score (St Dev) |
|---|---|---|---|
| Attitude to patient rights | 29.16 (4.13) | 29.02 (5.95) | -0.14 (5.76) |
| Attitude to HP additional training | 27.89 (3.39) | 26.83 (5.49) | -1.06 (5.07)* |
| Confidence in CCSMS ideology | 16.82 (3.04) | 18.83 (3.84) | 1.99 (3.89)* |
| Confidence assessing patient readiness for CCSMS | 6.63 (1.37) | 7.47 (1.68) | 0.84 (1.89)* |
| Confidence assisting patients to adopt CCSMS | 9.94 (2.22) | 11.58 (2.47) | 1.64 (2.69)* |

* Statistically significant at $p < .001$

Difference scores for the two attitude variables are found to be negative, indicating that participant agreement with the attitude statements actually decreased following completion of the CCSMS program. One of the statements "attitude to HP additional training" was found to be statistically significant ($p<.05$) with a difference score of -1.06. Paired T tests confirm the statistical significance of this result. The statement "attitude to patient rights" also scored a negative difference score (-0.14), however this was not statistically significant.

Conversely, the difference scores for the three confidence statements all recorded positive difference scores, indicating an improvement in confidence post the CCSMS program.

The statement "Confidence in CCSMS ideology" recorded a positive difference score (1.99), that was statistically significant (p<.001). Similarly, the statement "Confidence assessing patient readiness for CCSMS" recorded a positive score (0.84) which was found to be statistically significant (p<.001).

Finally the statement "Confidence assisting patients to adopt CCSMS", also recorded a statistically significant (p<.001) positive difference score (1.64), confirming improvements in confidence post program completion.

**Response scores for programme effectiveness and quality**

Table 4.6 presents data that describes the mean, standard deviation and Cronbach's alpha scores for the variables and the derived statements, relating to program effectiveness and quality.

**Table 4.6**
**Response scores for programme effectiveness and quality**

| Programme Learning Effectiveness<br>Statement:        (Cronbach's α) | Mean  (st dev) |
|---|---|
| **Visually effective** | **(.907)** |
| The visual resources helped me understand CCSM support | 4.26 (0.95) |
| The choice of text font and colour was easy to read | 4.19 (1.08) |
| The material presented was visually appealing | 4.11 (1.07) |
| The visual resources were appropriate to the content | 4.29 (0.99) |
| The graphic material (photos and videos) were of good quality | 4.19 (1.06 |
| **Promoted CCSMS understanding** | **(.924)** |
| The content helped me understand CCSM support | 4.12 (0.91) |
| The activities enhanced my learning | 4.11 (0.98) |
| The reflection opportunities enhanced my learning | 3.87 (0.98) |
| The program helped me to develop my skills for CCSM support | 4.16 (0.94) |
| I found the program motivated me to learn. | 3.91 (1.05) |
| I am satisfied with my experience with the program | 3.97 (1.11) |
| **Technically appropriate resource** | **(.857)** |
| I felt I could control my learning in the program | 4.10 (1.12) |
| I could find my way around the program | 4.31 (1.04) |
| The registration and log on processes were clear and easy to do | 4.42 (1.02) |
| The information presented was easy to follow | 3.99 (1.04) |
| I was able to access the links provided | 3.39 (1.12) |
| I was able to open the graphic material (photos and videos) with minimal delay | 4.02 (1.16) |
| | |
| **Program module quality** | |
| Module 1 Client centred care | 4.24 (0.97) |
| Module 2 Communication | 4.14 (0.99) |
| Module 3 Assessment | 4.17 (0.96) |
| Module 4 Behaviour change | 4.13 (0.97) |
| Module 5 Collaborative care | 4.16 (0.94) |
| Module 6 Diverse groups | 3.86 (1.08) |
| Module 7 Evaluation | 3.77 (1.08) |

The mean scores for Table 4.6 were high, averaging 4, while the range for standard deviation scores was quite narrow, centering around 1, indicating that most respondents recorded a score of 3, 4 or 5 on the five point Likert scale.

**Bivariate relationships between participant characteristics and programme effectiveness, and module quality**

ANOVA and post hoc analysis employing Bonferroni adjustments were employed to investigate the bivariate relationship between participant characteristics and satisfaction with the CCSMS program's effectiveness. Analysis of the relationship between each of the created process evaluation statements listed in table 4.6, and each of the participant characteristic was undertaken; yielding several statistically significant results. Percentages of highest satisfaction with each evaluation statement, within each participant characteristic, are presented in tables 4.7, 4.8 and 4.9.

Tables 4.7 and 4.8 present the findings of the bivariate relationship between participant's characteristics and program effectiveness. Several statistically significant findings were revealed in the occupation and workplace type characteristics. These findings are discussed following table 4.8.

Table 4.9 presents the findings of the bivariate relationship between participant confidence using both computers and the internet and program effectiveness. The findings are discussed following table 4.9

Tables 4.10 and 4.11 then go on to present the finding of the bivariate relationship between participant characteristics and module quality.

**Table 4.7**

**Bivariate relationship between participant characteristics and programme effectiveness**

| Characteristic | % most satisfied | | |
| --- | --- | --- | --- |
| | Visually effective | Promoted understanding | Technically appropriate |
| **Gender** | | | |
| Female | 82.4 | 75.2 | 59.4 |
| Male | 86.7 | 66.7 | 60.0 |
| **Age** | | | |
| ≤ 24 years | 82.4 | 82.4 | 64.7 |
| 25 – 34 | 75.5 | 59.2 | 55.1 |
| 35 – 54 | 80.8 | 71.2 | 57.7 |
| 55 ≥ years | 89.6 | 83.3 | 64.6 |
| Not reported | 92.9 | 100.0* | 57.1 |
| **Occupation** | | | |
| Registered Nurse | 84.8 | 79.3 | 62.1 |
| Dietitian | 93.8 | 62.5 | 62.5 |
| Aboriginal Health Worker | 45.5* | 36.4 | 18.2* |
| All others | 75.0 | 62.5 | 62.5 |
| **Working in a chronic health area** | | | |
| Yes | 77.5 | 70.4 | 59.2 |
| No | 88.4 | 81.4 | 64.0 |
| Not reported | 78.3 | 60.9 | 43.5 |
| **Time spent working in chronic area** | | | |
| Not | 88.4 | 81.4 | 88.4 |
| Up to one year | 76.5 | 64.7 | 76.5 |
| 2 - 4 years | 78.6 | 71.4 | 78.6 |
| 5 years + | 80.0 | 76.0 | 60.0 |

* Statistically significant at $p < .05$

**Table 4.8**

**Bivariate relationship between participant characteristics and programme effectiveness
continued.**

| Characteristic | % most satisfied | | |
|---|---|---|---|
| | **Visually effective** | **Promoted understanding** | **Technically appropriate** |
| **Workplace type** | | | |
| Hospital | 87.2 | 73.4 | 57.4 |
| Community Health | 76.2 | 73.8 | 54.8 |
| Aboriginal Health | 63.6 | 54.5 | 36.4* |
| Division of general practice and other | 84.8 | 84.8 | 78.8* |
| **Workplace location** | | | |
| Metropolitan | 83.3 | 75.6 | 60.0 |
| Rural | 82.7 | 73.3 | 57.3 |
| Remote | 80.0 | 73.3 | 66.7 |
| **Completed other online courses** | | | |
| Yes | 83.6 | 82.5 | 63.0 |
| No | 82.9 | 69.5 | 57.1 |
| Not reported | 50.0 | 50.0 | 50.0 |

\* Statistically significant at *p* < .05

Tables 4.7 and 4.8 reveal that participant satisfaction with program effectiveness was
not influenced by gender, with both recording similar levels of satisfaction in each category.
Satisfaction with the visually effective aspects of the program was found to vary with age
Post hoc analysis revealed one significant difference (*p* < .05); those who did not report their
age being most satisfied. Satisfaction with both the visual effectiveness and the technical
appropriateness categories varied with occupation. Post hoc analysis also revealed Aboriginal
health workers reported the least levels of satisfaction in both categories. No other significant
differences were found between participants in the other occupation or program effectiveness
categories. Satisfaction with the technical appropriateness within workplace type was also

found to vary. Those working in Aboriginal health recorded the least satisfaction, while those in the division of GP and other, recorded the highest level.

**Table 4.9**

**Bivariate relationship between participant confidence using both computers and the internet, and programme effectiveness**

| Characteristic | % most satisfied | | |
| --- | --- | --- | --- |
| | Visually effective | Promoted understanding | Technically appropriate |
| **Internet confidence** | | | |
| Least confident | 66.7 | 55.6 | 33.4 |
| Average confidence | 74.4 | 59.0 | 51.3 |
| Most confident | 86.4 | 80.3 | 63.6 |
| **Computer confidence** | | | |
| Least confident | 80.0 | 60.0 | 30.0 |
| Average confidence | 72.3 | 57.4 | 48.9 |
| Most confident | 87.0 | 82.1* | 65.9* |

* Statistically significant at $p < .05$

Table 4.9 reveals that participant confidence using the internet and computer, and satisfaction with the CCSMS program's effectiveness, varied across each confidence level and in each category.

 Although confidence using the internet did not statistically affect participant satisfaction, confidence using a computer did.  Post hoc analysis revealed that those most confident using a computer, were most satisfied with both the "Promoted Understanding" ($p < .05$) and "Technically Appropriate" ($p < .05$) aspects of the CCSMS program. No other statistically significant results were found among these characteristics or categories.

Tables 4.10 and 4.11 reveal participants levels of satisfaction within each module.

**Table 4.10**
**Bivariate relationship between participant characteristics and module quality**

| | % of participants most satisfied with modules | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Module one | Module two | Module three | Module four | Module five | Module six | Modul e seven | total |
| **Gender** | | | | | | | | |
| Female | 84.8 | 81.2 | 82.4 | 80.6 | 83.6 | 72.1 | 69.1 | 79.1 |
| Male | 86.7 | 73.3 | 73.3 | 80.0 | 86.7 | 53.3 | 60.0 | 73.8 |
| **Age** | | | | | | | | |
| ≤ 24 years | 82.4 | 82.4 | 82.4 | 82.4 | 82.4 | 64.7 | 64.7 | 77.3 |
| 25 – 34 | 75.5 | 71.4 | 73.5 | 71.4 | 71.4 | 63.3 | 61.2 | 69.7 |
| 35 – 54 | 90.4 | 82.7 | 82.7 | 80.8 | 86.5 | 67.3 | 69.2 | 79.9 |
| 55 ≥ years | 85.4 | 81.3 | 85.4 | 85.4 | 89.6 | 79.2 | 72.9 | 82.7 |
| Not reported | 100.0 | 100.0 | 92.9 | 92.9 | 100.0 | 85.7 | 78.6 | 92.9 |
| **Occupation** | | | | | | | | |
| Registered Nurse | 87.6 | 84.1 | 84.1 | 83.4 | 85.8 | 73.8 | 71.7 | 81.5 |
| Dietitian | 93.8 | 87.5 | 87.5 | 93.8 | 87.5 | 62.5 | 62.5 | 82.2 |
| Aboriginal Health Worker | 45.5* | 45.5 | 45.5 | 63.6 | 72.7 | 45.5 | 36.4 | 50.7 |
| All other | 75.0 | 50.0 | 75.0 | 25.0 | 62.5 | 62.5 | 62.5 | 58.9 |
| **Working in a chronic health** | | | | | | | | |
| Yes | 80.3 | 74.6 | 77.5 | 80.3 | 83.1 | 59.2 | 64.8 | 74.3 |
| No | 90.7 | 86.0 | 88.4 | 82.6 | 86.0 | 80.2 | 72.1 | 83.7 |
| Not reported | 78.3 | 78.3 | 69.6 | 73.9 | 78.3 | 69.6 | 65.2 | 73.3 |
| **Time working in chronic area** | | | | | | | | |
| Not | 90.2 | 86.0 | 88.4 | 82.6 | 86.0 | 80.2 | 72.1 | 83.6 |
| Up to one year | 76.5 | 70.6 | 70.6 | 88.2 | 76.5 | 41.2 | 64.7 | 69.8 |
| 2 - 4 years | 78.6 | 78.6 | 78.6 | 82.1 | 82.1 | 60.7 | 60.7 | 74.5 |
| 5 years + | 84.0 | 76.0 | 80.0 | 76.0 | 88.0 | 72.0 | 68.0 | 77.7 |
| Not reported | 79.2 | 75.0 | 70.8 | 70.8 | 79.2 | 66.7 | 66.7 | 72.6 |

∗ Statistically significant at $p < .05$

**Table 4.11**
**Bivariate relationship between participant characteristics and module quality continued**

| | % of participants most satisfied | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Module one | Module two | Module three | Module four | Module five | Module six | Module seven | total |
| **Workplace type** | | | | | | | | |
| Hospital | 89.4 | 86.2 | 86.2 | 81.8 | 85.1 | 72.3 | 71.3 | 81.7 |
| Community Health | 78.6 | 71.4 | 73.8 | 76.2 | 78.6 | 61.9 | 64.3 | 72.1 |
| Aboriginal Health | 54.5* | 63.6 | 54.5 | 72.7 | 81.8 | 63.6 | 63.63 | 64.9 |
| Division of GP and other | 90.9 | 81.8 | 87.9 | 84.8 | 87.9 | 78.8 | 66.7 | 82.7 |
| **Workplace location** | | | | | | | | |
| Metropolitan | 87.8 | 82.2 | 83.3 | 78.9 | 83.3 | 68.9 | 71.1 | 79.4 |
| Rural | 82.7 | 80.0 | 82.7 | 80.0 | 82.7 | 70.7 | 61.3 | 77.2 |
| Remote | 80.0 | 73.3 | 66.7 | 93.3 | 93.3 | 80.0 | 86.7 | 81.9 |
| **Completed other online courses** | | | | | | | | |
| No | 82.9 | 80.0 | 79.0 | 81.0 | 83.8 | 68.6 | 65.7 | 77.3 |
| Yes | 89.0 | 82.2 | 86.3 | 82.2 | 84.9 | 74.0 | 72.6 | 81.6 |
| Not reported | 50.0 | 50.0 | 50.0 | 0.0 | 50.0 | 50.0 | 50.0 | 42.9 |
| **Confidence using the Internet** | | | | | | | | |
| Least | 66.7 | 66.7 | 66.7 | 55.6 | 66.7 | 44.4 | 66.7 | 61.9 |
| Average | 76.9 | 74.4 | 66.7 | 74.4 | 82.1 | 61.5 | 53.8 | 70.0 |
| Most | 88.6 | 83.3 | 87.1* | 84.1 | 85.6 | 75.0* | 72.7 | 82.3 |
| **Confident using a computer** | | | | | | | | |
| Least | 80.0 | 80.0 | 70.0 | 60.0 | 60.0 | 40.0 | 50.0 | 62.9 |
| Average | 74.5 | 70.2 | 68.1 | 70.2 | 80.9 | 63.8 | 53.2 | 68.7 |
| Most | 89.4 | 84.6 | 87.8 | 86.2 | 87.0 | 75.6* | 75.6* | 83.7 |

*Statistically significant at $p < .05$

Satisfaction levels with module one "Client centred care", varied with occupation ($p < .05$), and workplace type ($p < .05$). Post hoc analysis revealed Aboriginal Health Workers, and those working in an Aboriginal Health service, were less satisfied with the module than all other professions. No other significant results were found among any of the other categories for module one.

Satisfaction levels for module two "Communication Skills" were found to vary with occupation ($p < .001$). Post hoc analysis revealed that the category "other professions" scored

exactly 50% satisfaction rate with the module. Nurses and dietitians scored highly, AHW scored low, however none of these were statistically significant.

Module three "Assessment Skills" and participant levels of confidence using the internet were found to be significantly significant ($p < .05$). Post hoc analysis revealed that those most confident using the internet were also those most satisfied with this module. No other statistically significant results were found for module three.

Participant levels of satisfaction in module four "Behaviour change techniques" compared to occupation show the only statistically significant finding for this module ($p < .001$). Post hoc analysis revealed that those in the category "other" to be very dissatisfied with this module. All other occupation types recorded very high levels of satisfaction, however none were statistically significant.

No statistically significant results were found for module five "Collaborative Care", with all participants in all categories reporting high levels of satisfaction with this module.

Levels of participant satisfaction with module six "Self-management in Diverse Groups" varied, with both confidence using the internet ($p < .05$) and a confidence using a computer ($p < .05$), with post hoc analysis revealing those most confident in each category recording the greatest satisfaction with each module. As expected those least confident in both categories, reported the least amount of satisfaction, and those average scored average. Neither result was significant however.

Participant's level of satisfaction with module 7 "Evaluating self-management" varied with their confidence using a computer ($p < .05$). Post hoc analysis revealed that those who were most confident using a computer recorded higher satisfaction with the module than those with the least amount and average amounts of computer confidence. No other significant statistic occurred in this module in any of the other categories.

**Relationships between participant characteristics, attitudes, and confidence in CCSMS**

Pearson's chi squared tests were employed to investigate the bivariate relationship between participant characteristics and their attitudes towards and confidence in CCSMS. Analysis of the purpose designed attitude and confidence statements compared to each of the participant characteristics was undertaken using the data obtained in both the pre survey, and the post survey. Results were tallied, and difference scores calculated. Pearson's chi squared tests were then employed, and applied to the difference scores to detect any statistically significant results.

**Attitude to patients' rights.**

Tables 4.12 present the difference scores, p values and participant characteristics for the question "Attitude to patients' rights".

**Table 4.12**
**Bivariate analysis of pre-post difference for:**
**Attitude to Patients' rights**

| Characteristic | % Pre-post difference | | | |
|---|---|---|---|---|
| | -ve | none | +ve | *p* value |
| **Gender** | | | | .012* |
| Female | 35.2 | 12.1 | 52.7 | |
| Male | 60.0 | 26.7 | 13.3 | |
| **Age** | | | | .236 |
| ≤ 24 years | 35.3 | 0 | 64.7 | |
| 25 – 34 | 49.0 | 14.3 | 36.7 | |
| 35 – 54 | 30.8 | 19.2 | 50.0 | |
| 55 ≥ years | 37.5 | 10.4 | 52.1 | |
| Not reported | 21.4 | 14.3 | 64.3 | |
| **Occupation** | | | | .476 |
| Registered Nurse | 37.2 | 11.7 | 51.0 | |
| Aboriginal Health Worker | 18.2 | 18.2 | 63.6 | |
| Dietitian and other | 45.8 | 20.9 | 33.3 | |
| **Working in a chronic health area** | | | | .001* |
| Yes | 45.1 | 19.7 | 35.2 | |
| No | 33.7 | 4.7 | 61.6 | |
| Not reported | 26.1 | 26.1 | 47.8 | |
| **Time spent working in chronic area** | | | | .029* |
| No time | 33.7 | 4.7 | 61.6 | |
| Up to one year | 41.2 | 23.5 | 35.3 | |
| 2 - 4 years | 42.9 | 17.9 | 39.3 | |
| 5 years + | 48.0 | 20.0 | 32.0 | |
| Not reported | 29.2 | 25.0 | 45.8 | |
| ∗ **Workplace type** | | | | .766 |
| Hospital | 33.0 | 13.8 | 53.2 | |
| Community Health | 47.6 | 11.9 | 40.5 | |
| Division of general practice and other | 39.4 | 12.1 | 48.5 | |
| Aboriginal Health | 27.3 | 18.2 | 54.5 | |
| **Workplace location** | | | | .643 |
| Metropolitan | 42.2 | 12.2 | 45.6 | |
| Rural | 32.0 | 13.3 | 54.7 | |
| Remote | 33.3 | 20.0 | 46.7 | |
| **Completed other online courses** | | | | .903 |
| Yes | 38.4 | 11.0 | 50.6 | |
| No | 36.2 | 15.2 | 48.6 | |
| Not reported | 50.0 | 0 | 50.0 | |

∗ Statistically significant at *p < .05*

Tables 4.12 reveals the statistically significant differences observed in the bivariate statistics for the participating student's gender and Attitude to patients' rights (p<0.05). Cross tabulation with chi square test revealed that females recorded an improvement in their attitudes to patient rights, whereas the attitudes of male participant diminished. $\chi^2$ (2, n=180) =8.78, p=0.012.

Although not statistically significant, a negative shift in attitude towards Patient's rights was observed amongst Dietitians, Podiatrists and pharmacists, with approximately 50% of each cohort regressing, whilst Registered Nurses and Aboriginal Health Workers both experienced positive trends of 51% and 64% respectively.

Working within a chronic area, showed a statistically significant result (p<0.05). Cross tabulation with chi square test revealed the attitudes of those working in a chronic area diminished, while those not working in a chronic area showed an improvement in attitude $\chi^2$(4,n=180)=17.57, p=0.012.

Attitudes to patient rights varied with time spent working in a chronic area (p<0.05). Cross tabulation and chi square tests revealed students having no time in a chronic area showed an improvement in attitude. Conversely the attitudes of those working in chronic care showed a minimal regression to negative attitude across all the other time frames, the largest of 48%, noted in the greater than 5 year time frame. $\chi^2$ (8, n=180) =17.15, p=0.029.

No statistically significant differences were observed for any other characteristics for this statement.

**Attitudes to Health professionals' additional training requirements.**

Tables 4.13 presents the difference scores, p values and participant characteristics for the question "Attitude to health professional's additional training requirements".

**Table 4.13**

**Bivariate analysis of pre-post difference for:**
**Attitude to Health Professionals' additional training requirements**

| Characteristic | % Pre-post difference | | | p value |
|---|---|---|---|---|
| | -ve | none | +ve | |
| **Gender** | | | | .712 |
| Female | 36.4 | 37.0 | 26.7 | |
| Male | 40.0 | 26.7 | 33.3 | |
| **Age** | | | | .038* |
| ≤ 24 years | 52.9 | 11.8 | 35.3 | |
| 25 – 34 | 42.9 | 42.9 | 14.3 | |
| 35 – 54 | 36.5 | 30.8 | 32.7 | |
| 55 ≥ years | 29.2 | 35.4 | 35.4 | |
| Not reported | 21.4 | 64.3 | 14.3 | |
| **Occupation** | | | | .228 |
| Registered Nurse | 34.6 | 36.4 | 29.0 | |
| Aboriginal Health Worker | 36.4 | 27.3 | 36.4 | |
| Dietitian and other | 50.0 | 37.5 | 12.5 | |
| **Working in a chronic health area** | | | | .904 |
| Yes | 40.8 | 33.8 | 25.4 | |
| No | 34.9 | 37.2 | 27.9 | |
| Not reported | 30.4 | 39.1 | 30.4 | |
| **Time spent working in chronic area** | | | | .673 |
| Not | 34.6 | 37.4 | 28.0 | |
| Up to one year | 27.8 | 33.3 | 38.9 | |
| 2 - 4 years | 38.2 | 38.2 | 23.5 | |
| 5 years + | 52.4 | 28.6 | 19.0 | |
| **Workplace type** | | | | .737 |
| Hospital | 36.2 | 31.9 | 61.2 | |
| Community Health | 42.9 | 35.7 | 21.4 | |
| Division of general practice and other | 30.3 | 45.5 | 24.2 | |
| Aboriginal Health | 36.4 | 45.5 | 18.2 | |
| **Workplace location** | | | | .898 |
| Metropolitan | 34.4 | 38.9 | 26.7 | |
| Rural | 38.7 | 34.7 | 26.6 | |
| Remote | 40.0 | 26.7 | 33.3 | |
| **Completed other online courses** | | | | .189 |
| Yes | 35.6 | 42.5 | 21.9 | |
| No | 36.2 | 32.4 | 31.4 | |
| Not reported | 100.0 | 0 | 0 | |

∗ Statistically significant at *p < .05*

Table 4.13 shows both genders recording a negative shift in their attitudes to HP training requirements, although this was not statistically significant.

Cross tabulations and Chi square tests revealed a statistically significant attitude changes amongst the age categories ($p < .05$). Those who were aged to 24 years saw the largest decline in attitude. Declines were also seen in the remaining age groups with the exception of those aged 55 and over, which saw a marginal increase in attitude post completion of the program. $\chi^2$ (8, n=180) =16.30, p=0.038.

Although no statistically significant results were observed in the occupation category, a negative trend was observed. This is most apparent amongst the dietitians and others category, where 50% regressed to a negative attitude compared with 12.5% positive. Differences for RN's and AHW's were minimal.

The working in a chronic area category demonstrated another area where attitudes regressed. Those working in a chronic area displayed a 40.8% negative shift as opposed to a 25.4% positive score, and those not working in a chronic area 34.9% and 27.9% respectively. However this was not statistically significant. Similar trends were also observed in the length of time working in a chronic area category, which although not significant, showed that attitudes of those working longest were more negative.

**Confidence in ideology of CCSMS.**

Table 4.14 presents the bivariate analysis of the pre-post difference for confidence in the ideology of CCSMS.

**Table 4.14**
**Bivariate analysis of pre-post difference for:**
**Confidence in the ideology of CCSMS**

| Characteristic | % Pre-post difference | | | p value |
|---|---|---|---|---|
| | -ve | none | +ve | |
| **Gender** | | | | .447 |
| Female | 18.8 | 12.1 | 69.1 | |
| Male | 26.7 | 20.0 | 53.3 | |
| **Age** | | | | .085 |
| ≤ 24 years | 29.4 | 11.8 | 58.8 | |
| 25 – 34 | 16.3 | 26.5 | 57.1 | |
| 35 – 54 | 17.3 | 7.7 | 75.0 | |
| 55 ≥ years | 20.8 | 8.3 | 70.8 | |
| Not reported | 21.4 | 0 | 78.6 | |
| **Occupation** | | | | .002* |
| Registered Nurse | 17.9 | 9.0 | 73.1 | |
| Aboriginal Health Worker | 18.2 | 36.4 | 45.5 | |
| Dietitian and other | 29.2 | 25.0 | 45.8 | |
| **Working in a chronic health area** | | | | .579 |
| Yes | 22.5 | 12.7 | 64.8 | |
| No | 17.4 | 10.5 | 72.1 | |
| Not reported | 17.4 | 21.7 | 60.9 | |
| **Time spent working in chronic area** | | | | .937 |
| Not | 18.7 | 13.1 | 38.2 | |
| Up to one year | 16.7 | 16.7 | 66.7 | |
| 2 - 4 years | 20.6 | 14.7 | 64.7 | |
| 5 years + | 23.8 | 4.8 | 71.4 | |
| **Workplace type** | | | | .034* |
| Hospital | 19.1 | 11.7 | 69.1 | |
| Community Health | 26.2 | 9.5 | 64.3 | |
| Division of general practice and other | 18.2 | 9.1 | 72.7 | |
| Aboriginal Health | 0 | 45.5 | 54.5 | |
| **Workplace location** | | | | .400 |
| Metropolitan | 16.7 | 11.1 | 72.2 | |
| Rural | 22.7 | 12.0 | 65.3 | |
| Remote | 20.0 | 26.7 | 53.3 | |
| **Completed other online courses** | | | | .851 |
| Yes | 19.2 | 12.3 | 68.5 | |
| No | 19.0 | 13.3 | 67.6 | |
| Not reported | 50.0 | 0 | 50.0 | |

∗ Statistically significant at *p < .05*

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Table 4.14 reveals gender differences show a strongly positive move in favour of the ideology of CCSMS. 69.1% of females report a positive change in their confidence with CCSMS and 53.3% of males the same; however this result was not statistically significant. Age categories mirrored this strongly positive trend with large positive differences across all categories with the age category 35 - 54 having the largest confidence level of 75%. This however was not statistically significant.

Participant levels of confidence with the CCSMS ideology, varied with occupation ($p<.05$). Cross tabulations and chi square tests found registered nurses saw the largest increase in confidence, followed by AHW's and others. No occupation categories saw a decrease in confidence. $\chi^2(6,n=180)=21.42$, $p=0.002$.

Workplace type impacted on participant confidence with CCSMS ideology ($p<.05$). Cross tabulations and Pearson's chi square test, revealed that all workplace types saw a massive increase in CCSMS confidence, the largest amongst those working in hospitals and Division of GP categories. $\chi^2(6,n=180)=16.64$, $p=0.034$.

No other statistically significant results were found for this comparison, however confidence with CCSMS ideology improved in every characteristic for this statement.

**Confidence assessing patient's readiness for CCSMS.**

Table 4.15 shows the results for confidence assessing a patient's readiness for CCSMS. No statistically significant results were recorded; however large positive differences were recorded in all categories.

**Table 4.15**
**Bivariate analysis of pre-post difference for:**
**Confidence assessing patient's readiness for CCSMS**

| Characteristic | -ve | none | +ve | p value |
|---|---|---|---|---|
| | **% Pre-post difference** | | | |
| **Gender** | | | | .636 |
| Female | 13.3 | 15.2 | 71.5 | |
| Male | 20.0 | 20.0 | 60.0 | |
| **Age** | | | | .981 |
| ≤ 24 years | 17.6 | 11.8 | 70.6 | |
| 25 – 34 | 14.3 | 12.2 | 73.5 | |
| 35 – 54 | 15.4 | 15.4 | 69.2 | |
| 55 ≥ years | 12.5 | 18.8 | 68.8 | |
| Not reported | 7.2 | 21.4 | 71.4 | |
| **Occupation** | | | | .633 |
| Registered Nurse | 13.1 | 14.5 | 72.4 | |
| Aboriginal Health Worker | 12.5 | 12.5 | 75.0 | |
| Dietitian and other | 12.5 | 25.0 | 62.5 | |
| **Working in a chronic health area** | | | | .787 |
| Yes | 15.5 | 14.1 | 70.4 | |
| No | 11.6 | 15.1 | 73.3 | |
| Not reported | 17.4 | 21.7 | 60.9 | |
| **Time spent working in chronic area** | | | | .909 |
| Not | 14.0 | 16.8 | 69.2 | |
| Up to one year | 5.6 | 11.1 | 83.3 | |
| 2 - 4 years | 17.6 | 14.7 | 67.6 | |
| 5 years + | 14.3 | 14.3 | 71.4 | |
| **Workplace type** | | | | .103 |
| Hospital | 9.6 | 13.8 | 76.6 | |
| Community Health | 26.2 | 19.0 | 54.8 | |
| Division of general practice and other | 9.1 | 12.1 | 78.8 | |
| Aboriginal Health | 18.2 | 27.3 | 54.5 | |
| **Workplace location** | | | | .947 |
| Metropolitan | 12.2 | 15.6 | 72.2 | |
| Rural | 16.0 | 14.7 | 69.3 | |
| Remote | 13.3 | 20.0 | 66.7 | |
| **Completed other online courses** | | | | .871 |
| Yes | 12.3 | 15.1 | 72.6 | |
| No | 15.2 | 16.2 | 68.6 | |
| Not reported | 0 | 0 | 100 | |

∗ Statistically significant at *p < .05*

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Table 4.15 revealed in the category gender, 71.5% of females and 60% of males recorded a positive change in their confidence to assess a client's readiness for CCSMS.

Age categories similarly scored large positive changes, the largest being in the up to age 24 category 70.6%, and the not recorded category 71.4%. Similar results were found in the Occupation category, with all professions recording positive increases. RN's recorded 71.4%, AHW's 75% and all others 62.5%.

The categories working in a chronic health area and time spent working in chronic area both recorded large increases in confidence assessing client readiness. Students not working in chronic health scores a 70.4% increase in confidence, while those who had been working 5 years + scored an increase of 71.4%.

Similar improvements were seen for workplace type, workplace location and completed other on-line, with a 100% increase of confidence recorded for those who did not report if they had previously completed other on-line courses.

**Confidence assisting patients to adopt CCSMS principles.**

Table 4.16 presents the results for the variable "Confidence assisting patients to adopt CCSMS principles".

**Table 4.16**
**Bivariate analysis of pre-post difference for:**
**Confidence assisting patients to adopt CCSMS principles**

| Characteristic | % Pre-post difference | | | |
|---|---|---|---|---|
| | -ve | none | +ve | p value |
| **Gender** | | | | .001* |
| Female | 13.3 | 11.5 | 75.2 | |
| Male | 13.3 | 46.7 | 40.0 | |
| **Age** | | | | .993 |
| ≤ 24 years | 11.8 | 17.6 | 70.6 | |
| 25 – 34 | 12.2 | 18.4 | 69.4 | |
| 35 – 54 | 15.4 | 11.5 | 73.1 | |
| 55 ≥ years | 14.6 | 12.5 | 72.9 | |
| Not reported | 7.1 | 14.3 | 78.6 | |
| **Occupation** | | | | .370 |
| Registered Nurse | 13.1 | 13.1 | 82.3 | |
| Aboriginal Health Worker | 9.1 | 18.2 | 72.7 | |
| Dietitian and other | 16.7 | 20.8 | 62.5 | |
| **Working in a chronic health area** | | | | .157 |
| Yes | 16.9 | 12.7 | 70.4 | |
| No | 11.6 | 11.6 | 76.7 | |
| Not reported | 8.7 | 30.4 | 60.9 | |
| **Time spent working in chronic area** | | | | .120 |
| Not | 11.6 | 11.6 | 76.7 | |
| Up to one year | 0 | 17.6 | 82.4 | |
| 1 - 4 years | 14.3 | 10.7 | 75.0 | |
| 5 years + | 28.0 | 12.0 | 60.0 | |
| * **Workplace type** | | | | .551 |
| Hospital | 10.6 | 13.8 | 75.5 | |
| Community Health | 21.4 | 14.3 | 64.3 | |
| Division of general practice and other | 15.2 | 15.2 | 69.6 | |
| Aboriginal Health | 0 | 18.2 | 81.8 | |
| **Workplace location** | | | | .491 |
| Metropolitan | 8.9 | 15.6 | 75.6 | |
| Rural | 18.7 | 13.3 | 68.0 | |
| Remote | 13.3 | 13.3 | 73.3 | |
| **Completed other online courses** | | | | .454 |
| Yes | 10.5 | 17.1 | 72.4 | |
| No | 17.8 | 11.0 | 71.2 | |
| Not reported | 0 | 0 | 100 | |

* Statistically significant at *p < .05*

Table 4.16 reveals that participant confidence wish assisting patients to adopt CCSMS principles varied with gender (p<.001).

Cross tabulation with Pearson's chi square tests revealed both male and female participants incurring a positive change and improvement in their confidence assisting clients to adopt CCSMS principles. $\chi^2(2,n=180)=14.12$, p=0.00.

No statistically significant result were observed in the age categories, however each age sub category did score a positive increase of approximately 70%,

Occupation also did not have a statistically significant result; however again, each profession did have a large positive change in their confidence following the program. Most notably, Aboriginal Health Workers showed an increase of 72.7%, and Registered Nurses 82.3%.

Time working in a chronic area, although not statistically significant, recorded strong positive changes in each of the following sub categories: No time spent working in a chronic area (76.7%); working for up to one year (82.4%); working 1to 4 years (75%); and 5 years + 60%.

Workplace type and workplace location did not record statistically significant results, however in both, positive improvements in confidence were observed. Hospital and Aboriginal health both saw increased confidence levels of 75.5% and 81.8% respectively, Community Health 64.3% and others 69.3%. Increased confidence among metro workers (76%), slightly less among rural (68%), slightly more (73%) amongst remote workers were measured in Workplace location sub categories.

Previous online course experience saw similar increases in confidence which was not statistically significant.

# Chapter 5. Discussion

**Summary of main research findings**

Approximately 75% of students reported high levels of satisfaction and with the programme's ease of accessibility, processes, structure, and module content. Positive attitudes towards patient rights and additional health professional training requirements were found to have decreased, while confidence delivering self-management support to their patients was found to increase following completion of the programme. Comparison of the pre and post survey data found the degree of change in attitudes and confidence among participants differed on the basis of their characteristics.

**Interpretation of findings**

**Programme accessibility, effectiveness and engagement.**

In this study, satisfaction with the ability of participants to both access the programme and engage with the learning materials was found to be high, although results differed among participants depending on characteristics.

*CCSMS programme accessibility to students from metropolitan, rural and remote locations.*

The delivery of the CCSMS programme in an on-line format allows for access to the programme by a wide range of people irrespective of their location. Participants were able to access the programme wherever they had access to a computer and the internet. Even though over 50% of participants resided in rural and remote communities, this study failed to identify any differentiation between this group and their metropolitan counterparts. The findings

suggest that on-line delivery of the programme not only allowed for localised learning, it overcame disadvantages presented by distance (NRHA, 2009; Warren, 2007).

### *The influence of participant demographics and existing IT skills on perceived effectiveness of the CCSMS programme.*

On the basis of the available literature, the evidence suggests that students with poor information technology skills and little to no previous on-line education experience, would have detrimental learning experiences with on-line education programmes (Howland & Moore, 2002; McAlister et al., 2001). This was not found to be the case. The study findings revealed that very little difference existed in overall satisfaction rates between those participants with poor and strong IT skills. One possible explanation for this is the use of the principles of adult learning to guide the structure and content of each module. These principles respect the participants prior knowledge and experience, ensuring learning is relevant, practical and specifically for this programme, self-directed (Clapper, 2010; Conlan et al., 2003; Murad et al., 2010).

Furthermore, examination of participant satisfaction scores revealed strong levels of satisfaction with the effectiveness of the CCSMS programme across all participant characteristics except Aboriginal Health Workers. Exploration of the literature provides a reason why this particular finding may have occurred. Barriers to learning, presented by the poor literature skills that are often found amongst indigenous communities, are cited as a possible cause (Adams et al., 2005; Rose & Devonshire, 2004b). However, given that participants are completing this programme as part of a post graduate course, literacy levels were assumed to be more than adequate to those necessary for programme completion, and not considered to be an issue. Reasons behind these findings may well be the subject of future research.

The combination of learning methods within each module enables participants to interact and engage in the learning process effectively. The self-paced nature of the programme, the learning activities that offered opportunities for reflection, the presentation of real life examples of the CCSM principles in practice, and the feedback opportunities, provided participants with an opportunity to both visualise the concepts taught, and reflect on how they can be applied to their own practice.

Participant satisfaction with their ability to control when and how much they engaged with the programme materials was found to be very strong. The self- directed and self-paced programme provide participants with the ability to work through the modules in their own time, and these qualities are a strength of the programme. Murad et al (2010) found these aspects provide participants with the ability to both improve knowledge gains and skills. Furthermore, self-directed self-paced learning provides opportunities to research topics before proceeding, thereby allowing students to obtain a greater understanding of subject matter (Brown, 1997). Self directed learning is also known to have limitations. Motivation and procrastination are cited in the literature as being major impedances to effective self-directed online learning (Rakes & Dunn, 2010). Although Rakes & Dunn (2010) suggest this issue exists in on-line learning, the study findings revealed this not to be the case for the CCSMS programme. Participant responses strongly indicated the programme motivated their learning.

The several different learning activities provided throughout the modules were found to enhance the participant's learning experience and thus can be seen as strength of the programme's approach. Findings revealed participant satisfaction with each of the learning activities to be strong. Firstly, participants were required to self-reflect on the learning content provided prior to answering the questions posed. As each participant was already a health professional, self reflection allowed for opportunities to draw on their own experiences

and expertise, and understand how the learning content could relate to their own practice. Self reflection is known not only to assist with knowledge retention, it has been found to enhance and consolidate learning experiences (P. Chen et al., 2010; Conlan et al., 2003; M. Lee et al., 2005).

Secondly, a series of video vignettes presented by genuine health professionals was used to demonstrate how the subject matter is applied to real life situations. The use of genuine health professionals allowed participants to relate to the situations, and imagine how each of the concepts can be used in their own practice. Furthermore, the presentation of the subject matter in action is known to enhance understanding of the concepts taught, and assist with consolidation of participant learning and knowledge (Abrami et al., 2011; Koeckeritz et al., 2002)

Finally the "expert responses" or immediate feedback provided throughout each module was found to enhance participants understanding of the learning materials, and potentially overcome any of the motivational issues generally found in on-line learning. Immediate feedback allows participants to correct any misunderstandings, increasing motivation to proceed through the module with confidence. Lee et al (2005) and Jonas & Burns (2010) both agree, citing that immediate feedback fosters engagement with a programme or course, thereby enhancing performance and engagement with the learning materials.

**Does the CCSMS programme adequately prepare participants to apply CCSMS in practice?**

In this study, positive attitudes towards and confidence in delivering chronic condition self-management support to patients, were found to differ among the participants, depending on their characteristics. Studies into similar health professional educational programs mirror

these findings, revealing they are not unique to this study(Anderson & Funnell, 2005; McCann et al., 2008).

### *Impact of the programme on participants attitudes towards self-management support.*

The study findings that female participant's positive attitudes towards the rights of patients increased, while those of male participants decreased, are consistent with those found in other research. McCann et al's (2008) found female health professionals are more likely than males to accept the rights of patients to self-care. However the underrepresentation of male respondents in this study sample (15%), may have introduced some bias, and therefore may account for these findings.

A direct association between participant age, the length of time participants had worked in a chronic care area, and the positive attitudes held by those participants towards the rights of patients was found in this study. This is consistent with the finding of prior research where participants who were newly or recently qualified, were found to more readily accepted the rights and involvement of patients in their own care (Anderson & Funnell, 2005; McCann et al., 2008). However, McCann et al's (2008) finding that older, more experienced practitioners tended to hold on to traditional approaches to care, and were reluctant to adopt a new paradigm, was not found to be entirely the case for this study. With the exception of males, attitudes towards patient rights in the older age ranges were found to improve following completion of the CCSMS programme.

Finally, the study revealed that positive attitudes towards additional training requirements for participants overall decreased following completion of the programme. No specific reasons why a decrease in positive attitude would occur were identified in the literature. A possible explanation for this may answer be the barriers that prevent health

professionals from receiving additional training (discussed in chapter 2). Although this programme was designed to overcome many of these barriers, perhaps participants may have still felt affected by them and have responded accordingly? The ease of access, minimal to no cost, and localised learning provided by the programme were purpose designed to effectively overcome existing barriers to learning. In the only exception to these findings, the positive attitudes of participants aged 55 years and over were found to increase. Fitzgerald (2007) found that both a desire to reduce workloads and a desire retrain in a less arduous job, as possible reasons why attitudes of older health professionals towards additional training are often positive. This may be a reason for why participants in the older age groups were more likely to endorse positive attitudes toward additional training in CCSMS.

### *Impact of the programme on participants' confidence in applying self-management support in their practice.*

Confidence in any health intervention is an important aspect of ensuring its successful inclusion into practice (Bower et al., 2012a; Kosmala-Anderson et al., 2010). Effective training and education not only provides understanding and knowledge, it improves confidence which enables health professionals to apply an intervention into their own practice. The study found that following completion of the CCSMS programme, the knowledge and confidence of participants on how to apply and include self-management support into their practice noticeably improved across all participants regardless of their demographic characteristics. It is clear from the results that the content, structure, and method of delivery of the programme contributed to this improvement. Learning activities including video presentations demonstrating the concepts in action, the opportunities provided for self-reflection whereby participants can relate learning content to individual practice, and the self-directed nature of the programme, are amongst the adult learning techniques employed in the CCSMS programme that participants rated highly. The use of adult learning techniques are a

strength of the programme, as they are known to enhance participant's learning experiences and build both knowledge and confidence (Okuda et al., 2009). Furthermore, associations between such learning techniques and improvements in the knowledge and confidence of health professionals to include and apply the principles of self-management support into their own practice have also been found to exist in the literature.  Kirby et al (2012) describes the inclusion of such learning activities as a method of fostering both the knowledge and confidence needed to apply self-management support in practice.

**Strengths and limitations of the study**

### Strengths.

The study has a number of strengths. Firstly, a search of available literature revealed the online delivery of the surveys to be a major strength. Unlike traditional paper based mail, personal or telephone surveys, online surveys are seen to be low cost alternatives to paper that, incorporate flexibility, are faster to conduct, attract  greater response rates and obtain a similar quality of data (Evans & Mathur, 2005). The online delivery of the entire CCSMS programme assisted in simplifying completion of the surveys, as they were conveniently delivered as an optional component of the programme, and not a separate item. Thus ensuring there was no need for participants to complete a separate programme or log out of the CCSMS modules in order to participate in and complete the surveys.

Secondly, the survey instruments were designed in a manner that ensured each section was relevant to the course. Employing the widely used and validated DAS-3 instrument on which to base survey questions, and the involvement of an expert project team in the development of the questions (Glaister, 2010b); the survey instruments including the adapted version of the DAS3 tool, used in this study were developed in a manner that ensured the data captured in the surveys was both valid, and that deemed necessary to evaluate the

programme. With the pilot trial confirming construct validity, the survey instrument adds further strength to the study.

Thirdly, the inclusion of the CCSMS programme into the course content of several post graduate diabetes education courses ensured the surveys were completed by those it was designed for - health professionals.

**Limitations.**

The collection of purely quantitative data was a major limitation of this study. The inflexible nature of quantitative data does not allow for participants personal perceptions or feelings about the CCSMS programme to be considered. A mix of qualitative and quantitative data would have provided a more robust data set that may have provided greater insight into reasons for some of the findings, especially those of the Aboriginal Health Workers.

The large majority of participants were nurses, 90%, with representations from other health professionals being extremely low. Consequently a combination of several, less well represented professions such as Pharmacists and Podiatrists were combined into the "other" health professions category, which detracted from and did not allow a clear and accurate representation of the programmes effects for each of those "other" health professionals or a complete interpretation of the results for those professions.

Participants were provided the option to complete both surveys. Access to the post survey required a few extra steps as, unlike the pre survey which presented upon registration into the programme, the post survey did not automatically present on completion of module seven. Students were required to take a few extra steps in order to access it, which may account for the response rate.

On-line / distance learning programs are known to have limitations. Although the surveys used in this evaluation were specifically designed to evaluate student engagement

with the programme, and determine the programme's effect on both attitudes and confidence, several important areas were not considered in this evaluation that could have impacted on the student's engagement with the programme:

*1) How the lack of opportunity for the students to ask questions to clarify understanding affected student learning?*

*2) What effect the social isolation factor had on the student satisfaction?*

*3) How the lack of opportunity for students to verbalise the concepts taught and practice them in action, impacted on student attitudes and confidence?*

*4) The potential for ambiguity in responses as students may interpret Likert scale scores differently.*

Finally, this study does not contain either an outcome evaluation – or follow up plan, necessary to determine the effect of the programme and investigate if it actually leads to any real change in the student's practice. This remains a topic for future study; however, because of the anonymous nature of the data, future follow up studies may be problematic.

**Implication for practice / recommendations**

With the increasing prevalence of chronic diseases seen worldwide and the increasing benefits associated with patient empowerment and self-management, more health professionals need to be prepared and equipped with the skills and abilities to instil self-management principles in their clients. Furthermore, with the demand for health professionals such as nurses growing, online education and distance education are becoming the media of choice for health professional education (Nagia, Hodson-Carlton, & Ryan, 2004). Not only is online learning seen as a cost effective option, its convenience, accessibility, flexibility and speed are cited among the benefits of this increasingly popular mode of learning (Evans &

Mathur, 2005).The principle aim of this study was to evaluate the CCSMS programme and determine its value for inclusion into health education courses.

The findings of this study reveal that students benefited from the online learning approach and the manner in which the learning content was presented. The combination of learning tools including the opportunities to self-reflect, ability to see concepts in action via the video vignettes, and the self-paced manner of the CCSMS programme was found to enhance student learning and knowledge retention.

Analysis of the data obtained through the pre and post surveys revealed that the post graduate students, already practicing health professionals in their own rights, gained an understanding of the principles of CCSMS from the programme they previously did not have. Further to this, the participants also acquired the skills required and gained the necessary confidence from the programme, enabling them to empower their patients with self-management principles and skills.

The current format, the CCSMS programme appears to successfully equip health professionals with the skills and confidence needed to include self-management principles into their own practice. If rolled out into undergraduate and post graduate health education programs, the CCSMS programme would effectively prepare health professionals for the task.

Possible improvements that may further enhance programme effectiveness could include: The use of Skype (or similar) to provide students with an opportunity to verbalise and practice the concepts in action, the availability of an "expert "to answer any questions, or clarify any confusion students may have relating to the programme content, and a forum whereby students could communicate with each other, overcoming any isolation they may feel.

Finally, in order to fully evaluate how the CCSMS programme has impacted on students practice, follow up research should be undertaken that examines the success (or lack thereof), the inclusion of the CCSMS principles into practice has had. This would require a long term look at any benefits that have occurred, including improvements in health outcomes, reduces reliance on health care systems, and overall reductions in the impacts of chronic illness on the person, their families and the health care system that can result.

**Conclusion**

This study has shown the CCSMS programme effectively provides health professionals, irrespective of which profession they belong to, the tools and skills needed to effectively include the principles of self-management into their practice. Furthermore, health professionals gain the ability to empower their patients with the skills to self-manage and have greater input into the treatment of their chronic conditions. Given the increasing prevalence of chronic disease worldwide, the tools and skills acquired by completing the CCSMS programme are both a timely, and necessary component for successful chronic disease self management support.

The on-line delivery of the programme has the ability to reach a large number of students, irrespective of their location, as was evidenced in this study. While the structure of the modules, ease and simplicity of access, and self-paced nature of the programme, appealed equally to all users, even those with limited or poor IT skills.

Given the strongly positive influence the programme has on student confidence in applying the skills of CCSMS to their patients; this program is well placed to meet the education needs of current and future health professionals, who will need to be prepared for the burgeoning impact of chronic illness and disease worldwide.

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# Pre-Survey

## Section 1 - Personal Details

| | |
|---|---|
| 1. What is your gender? | ☐ Male  ☐ Female |
| 2. What was your age last birthday? | ☐ ☐ |
| 3. a) Which of the following best describes your Current health profession?<br><br>*Select all that apply*<br><br>**If you are not a health professional please Continue to the next question** | ☐ Diabetes Educator<br>☐ Dietitian<br>☐ Exercise physiologist<br>☐ Medical  doctor<br>☐ Nurse<br>☐ Occupational therapist<br>☐ Pharmacist<br>☐ Physiotherapist<br>☐ Podiatrist<br>☐ Other<br>    *Please specify_____* |
|   b) How long have you worked in this profession? | ☐☐ years |
| 4 a) Which country do you reside in? | _____ |
|   b) How would you describe the location where you reside? | ☐ Metropolitan  ☐ Rural  ☐ remote |
|   c) If you reside in Australia, what is your residential postcode? | ☐☐☐☐ |
| 5 a) What is your principle health -related place Of work? | ☐ Not applicable<br>☐ Hospital<br>☐ Community Health<br>☐ Division of General Practice<br>☐ Not working in health<br>☐ Other<br>    *Please specify _____* |
|   b) Do you work in a chronic disease speciality area? | ☐ Yes ☐ No |
|   c) If yes, how long have you worked in this chronic disease area? | ☐☐ years |
| 6 What was your main reason for undertaking the Programme? | ☐ I am a university student studying in a related area<br>☐ I am a university student required to complete the Programme as part of my course<br>☐ I am a health professional completing the programme to obtain credentialling  points<br>☐ I am a health professional completing the programme to obtain continuing professional development points<br>☐ I am a health professional completing the programme for my own interest / development<br>☐ Other<br>    *Please specify _____* |

| 7 If you are a university student, please answer the Following questions **If you are a not a university student, please move on to the next question** | | | | | |
|---|---|---|---|---|---|
| a) What university are you studying at? *type name in full* | _____ | | | | |
| b) What course are you studying? *type name in full* | _____ | | | | |
| c) What is the award level of the course? | ☐ Undergraduate  ☐ Graduate/Postgraduate Dip  ☐ Graduate/Postgraduate cert ☐ Masters  ☐ PhD | | | | |

| 8 I have completed other on-line courses | ☐ yes | ☐ no |
|---|---|---|

| | *Not at all* | | *Somewhat* | | *Totally* |
|---|---|---|---|---|---|
| 9 I feel confident using a computer | ☐ | ☐ | ☐ | ☐ | ☐ |

| | | | | | |
|---|---|---|---|---|---|
| 10 I feel confident using the internet | ☐ | ☐ | ☐ | ☐ | ☐ |

## Section 2 - Attitude towards chronic condition self-management support

| In general I believe that... | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|
| **11** The important decisions regarding chronic condition care should be made by the person with the condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| **12** Health care professionals should help clients make informed choices about their care plans | ☐ | ☐ | ☐ | ☐ | ☐ |
| **13** People with chronic conditions should have the final say in setting their health goals | ☐ | ☐ | ☐ | ☐ | ☐ |
| **14** The person with the chronic condition is the most Important member of the health care team | ☐ | ☐ | ☐ | ☐ | ☐ |
| **15** People with a chronic condition should learn about the disease so they can be in charge of their own care | ☐ | ☐ | ☐ | ☐ | ☐ |
| **16** What the person does has more effect on the outcome of condition care than anything a health professional does | ☐ | ☐ | ☐ | ☐ | ☐ |
| **17** People with a chronic condition have a right to decide how hard they will work to control their condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| **18** People with a chronic condition have the right to NOT take good care of their condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| **19** Health professionals should be trained to communicate well with people with chronic conditions | ☐ | ☐ | ☐ | ☐ | ☐ |
| **20** Health professionals should be taught to assess how a chronic condition affects the individuals' lives | ☐ | ☐ | ☐ | ☐ | ☐ |
| **21** It is important for health professionals, working with people with chronic conditions, to learn counselling skills | ☐ | ☐ | ☐ | ☐ | ☐ |
| **22** Health professionals should learn how to set goals with clients, not just tell them what to do | ☐ | ☐ | ☐ | ☐ | ☐ |
| **23** To do a good job, health professionals should learn how to assist individuals to change their behaviour | ☐ | ☐ | ☐ | ☐ | ☐ |

## Section 3 - Confidence in chronic condition self-management support

| How confident do you feel about the following: | Not at all confident | A little confident | Somewhat confident | Very confident | Totally confident |
|---|:---:|:---:|:---:|:---:|:---:|
| **24** Awareness of my own philosophy of care. | ☐ | ☐ | ☐ | ☐ | ☐ |
| **25** Assessing a client's self-management capability | ☐ | ☐ | ☐ | ☐ | ☐ |
| **26** Assessing a client's readiness, confidence and importance for behavioural change | ☐ | ☐ | ☐ | ☐ | ☐ |
| **27** Understanding and communicating with different cultural groups | ☐ | ☐ | ☐ | ☐ | ☐ |
| **28** Interpreting non-verbal forms of communication | ☐ | ☐ | ☐ | ☐ | ☐ |
| **29** Using communication techniques, e.g. reflective listening, open-ended questions, paraphrasing | ☐ | ☐ | ☐ | ☐ | ☐ |
| **30** Assisting clients to identify and solve their own problems | ☐ | ☐ | ☐ | ☐ | ☐ |
| **31** Assisting clients to develop a SMART* goal and Individualised action plan. | ☐ | ☐ | ☐ | ☐ | ☐ |
| **32** Using strategies or skills to support behavioural change e.g. motivational interviewing techniques, enhancing self- efficacy | ☐ | ☐ | ☐ | ☐ | ☐ |
| **33** Engaging in collaborative care planning with the client and other health professionals | ☐ | ☐ | ☐ | ☐ | ☐ |
| **34** Applying evaluation principles for quality improvement purposes | ☐ | ☐ | ☐ | ☐ | ☐ |
| **35** Integrating evidence-informed evaluation and research into practice | | | | | |

*Specific. Measurable. Attainable. Realistic. Timely.

**Appendix B- Post-survey**

*This survey shows the detail of the questionnaires, but the set up will be on-line*

# Post-Survey

## Section 1 – About the program

| | Never | Seldom | Sometimes | Often | Always |
|---|---|---|---|---|---|
| 1. The content helped me understand CCSM support | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. The visual resources helped me understand CCSM support | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. The activities enhanced my learning | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. The reflection opportunities enhanced my learning | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. The program helped me develop my skills to Provide CCSM support | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. I found the program motivated me to learn | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. I felt I could control my learning in the program | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. I am satisfied with my experience with the program | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. The choice of text font and colour was easy to read | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. I could find my way around the program | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. The registration and log on processes were clear and Easy to do | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. The material presented was visually appealing | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. The visual resources were appropriate to the content | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. The information presented was east to follow | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15. I was able to access the internet links provided | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16. The graphic material (photo and Video) were of good quality | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17. I was able to open the graphical material (photos And videos) with minimal delay | ☐ | ☐ | ☐ | ☐ | ☐ |

| Modules | Very poor | Poor | Average | Good | Excellent |
|---|---|---|---|---|---|
| 18. The quality of Module 1 -  Client Centres Care was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19. The quality of Module 2 -  Communication was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20. The quality of Module 3 -  Assessment was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21. The quality of Module 4 – Behavioural Change was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22. The quality of Module 5 – Collaborative Care was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23. The quality of Module 6 -  Diverse Groups was | ☐ | ☐ | ☐ | ☐ | ☐ |
| 24. The quality of Module 7 – Evaluation was | ☐ | ☐ | ☐ | ☐ | ☐ |

25. If you were unhappy with any and aspects of the program, please suggest how we can make improvements

_____
_____
_____
_____

# Section 2 - Attitude towards chronic condition self-management support

| In general I believe that... | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|
| 26. The important decisions regarding chronic condition care should be made by the person with the condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| 27. Health care professionals should help clients make informed choices about their care plans | ☐ | ☐ | ☐ | ☐ | ☐ |
| 28. People with chronic conditions should have the final say in setting their health goals | ☐ | ☐ | ☐ | ☐ | ☐ |
| 29. The person with the chronic condition is the most Important member of the health care team | ☐ | ☐ | ☐ | ☐ | ☐ |
| 30. People with a chronic condition should learn about the disease so they can be in charge of their own care | ☐ | ☐ | ☐ | ☐ | ☐ |
| 31. It is frustrating for people with a chronic condition to take care of their condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| 32. People with a chronic condition have a right to decide how hard they will work to control their condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| 33. People with a chronic condition have the right to NOT take good care of their condition | ☐ | ☐ | ☐ | ☐ | ☐ |
| 34. Health professionals should be trained to communicate well with people with chronic conditions | ☐ | ☐ | ☐ | ☐ | ☐ |
| 35. Health professionals should be taught to assess how a chronic condition affects the individuals' lives | ☐ | ☐ | ☐ | ☐ | ☐ |
| 36. It is important for health professionals, working with people with chronic conditions, to learn counselling skills | ☐ | ☐ | ☐ | ☐ | ☐ |
| 37. Health professionals should learn how to set goals with clients, not just tell them what to do | ☐ | ☐ | ☐ | ☐ | ☐ |
| 38. To do a good job, health professionals should learn how to assist individuals to change their behaviour | ☐ | ☐ | ☐ | ☐ | ☐ |

## Section 3 - Confidence in chronic condition self-management support

| How confident do you feel about the following: | Not at all confident | A little confident | Somewhat confident | Very confident | Totally confident |
|---|---|---|---|---|---|
| 39.  Awareness of my own philosophy of care. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 40.  Assessing a client's self-management capability | ☐ | ☐ | ☐ | ☐ | ☐ |
| 41.  Assessing a client's readiness, confidence and importance for behavioural change | ☐ | ☐ | ☐ | ☐ | ☐ |
| 42.  Understanding and communicating with different cultural groups | ☐ | ☐ | ☐ | ☐ | ☐ |
| 43.  Interpreting non-verbal forms of communication | ☐ | ☐ | ☐ | ☐ | ☐ |
| 44.  Using communication techniques, e.g. reflective listening, open-ended questions, paraphrasing | ☐ | ☐ | ☐ | ☐ | ☐ |
| 45.  Assisting clients to identify and solve their own problems | ☐ | ☐ | ☐ | ☐ | ☐ |
| 46.  Assisting clients to develop a SMART*  goal and Individualised action plan. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 47. Using strategies or skills to support behavioural change e.g. motivational interviewing techniques, enhancing self- efficacy | ☐ | ☐ | ☐ | ☐ | ☐ |
| 48. Engaging in collaborative care planning with the client and other health professionals | ☐ | ☐ | ☐ | ☐ | ☐ |

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Appendix C

# PARTICIPANT INFORMATION SHEET

**Project**
> Chronic Condition Self-Management Support: An online Resource for Health Professionals.

With the change in focus of health care, a large part of our work as a Health Professional, involves supporting clients with chronic disease to self manage their condition. This on-line educational program is provided assist you develop the necessary practical skills to apply in the clinical setting.. Your feedback is important, as it will enable the determination of this programs effectiveness to deliver effective CCSMS training.

**Your consent**
This sheet contains information about the educational program and its evaluation. Its purpose is to explain to you what is involved in the program's evaluation. Please read the information carefully to ensure you understand what is involved.

**Aim of the project**
Funding was received from the Department of health and Ageing in 2010, to develop an education program that delivered CCSMS training to health professionals. A program was developed, and piloted in the same year The program aimed to support active, interprofessionallearning that better equipped health professionals to facilitate behavioural changes in their clients, promoting the adoption of self management principles. Now that this program has been released to a wider, national audience, the aim of this project is to investigate the effectiveness this on-line learning program has, on enabling health professionals to engage their clients in self management principles.

**Participation in the project**
If you are interested in participating in the project, you will be asked to complete a brief survey when you commence it, and again on program completion. Each survey is anticipated to take no more than five minutes to complete.
Your participation in this project is entirely voluntary. You do not need to volunteer for the project in order to use the education resource. You have the right to withdraw from the project at any time during the period, and this will not affect your access to the educational program or influence your study progress in any way.

**Privacy and confidentiality**
Only the project coordinator will have access to the information provided by you for this project. Any information you supply will be stored electronically in a locked archive in the project coordinators office at the university, where it will be kept securely for 5 years in accordance with National Health and Medical

Research Council ethical guidelines. No data will be stored that can be linked in any way to log in details you provide when you access the education resource.

The results of the survey may be disseminated at conferences and educational meetings or submitted to a peer review journal. Your personal information or other identifying information is not stored and therefore cannot be revealed or identified in any presentation or publication.

**Adverse effects of involvement in the project.**
It is not anticipated that completion of the survey will cause any adverse effects.

**Ethics Approval**
This study has been approved by the:
Curtin University Human Research Ethics Committee, with approval number
SON&M6-2010

If needed, verification of approval can be obtained by contacting the:
Curtin University Human Research Ethics Committee
c/o The Office of Research and Development, Curtin University
GPO Box U1987, Perth WA 6845.
Tel: 08 9266 2784 Email: hrec@curtin.edu.au

**Contact details of project officer**

If you require further information, or if you have any concerns with this study, please contact the project officer below.

ian Harmer
Course coordinator/Associate Lecturer post graduate Diabetes programs, School of Nursing and Midwifery, Faculty of Health Sciences,
Curtin University,
GPO Box U1987, Perth WA 6845.
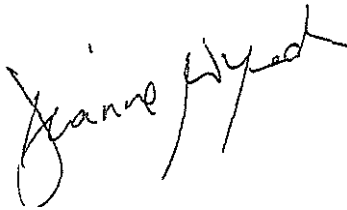Tel (08) 9266 2201
Ian.harmer@curtin.edu.au

## Memorandum

| | |
|---:|---|
| To | Mr. Ian Harmer; Mr. Alan Tulloch |
| From | Professor Dianne Wynaden |
| Subject | Protocol Approval SON&M 18-2011 |
| Date | 10th August 2011 |
| Copy | |

Office of Research and Development
Human Research Ethics Committee
Telephone        9266 2784
Facsimile          92663793
Email      hrec@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "Chronic condition self management support: Evaluation of an online program". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months from 10th August 2011 to 10th August 2012. The approval number for your project is SON&M 18-2011. *Please quote this number in ony future correspondence.* If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Professor Dianne Wynaden
Low Risk Coordinator/Ethics Advisor
School of Nursing and Midwifery

Please Note: The following standard statement must be included in the information sheet to participants:
*This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number SON&M 18-2011). 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 hrec@curtin.edu.au*
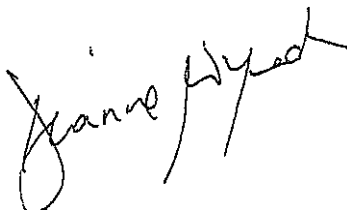
**Memorandum**

| | |
|---|---|
| To | Ian Harmer |
| From | Professor Dianne Wynaden |
| Subject | Protocol Approval SON&M 18-2011 |
| Date | 13th August 2012 |
| Copy | |

Thank you for your "Form C renewal Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "Chronic condition self- management support: Evaluation of an online program". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is renewed.

Approval of this project is for a period of twelve months from 10th August 2012 to 10th August 2013.

The approval number for your project is SON&M 18-2011. *Please quote this number in any future correspondence.* If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Professor Dianne Wynaden
Low Risk Coordinator/Ethics Advisor
School of Nursing and Midwifery

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Please Note: The following standard statement must be included in the information sheet to participants:
*This study has been approved under Curtin University's process for lowerwrisk Studies (Approval Number SON&M 18-2011). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21).*
*For further information on this study contact the researchers named above or the Curtin University Human Research Ethics*
Committee c/- Office of Research and Development, Curtin UniversityJ GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au..