

School of Nursing and Midwifery

**Comparison of breastfeeding knowledge and attitudes of
selected adolescent males and females from rural and
metropolitan secondary schools**

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Declaration

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

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.

Dianne Therese Juliff

June 2005

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Abstract

Research has indicated that adolescents hold both negative and positive attitudes and have common misconceptions about breastfeeding that appear to result from their limited knowledge and reduced exposure to breastfeeding. The purpose of this study was to determine the knowledge and attitudes toward breastfeeding of adolescent male and female secondary school students. The study also sought to elicit information on factors that may influence the decision regarding future infant feeding methods. Self-efficacy theory was the theoretical framework to guide the study. This quantitative descriptive study, using a cross-sectional design, involved consenting secondary school students' completing a self-report questionnaire. The study employed purposive sampling and included 1845 males and females in both year-nine and year-12 at designated metropolitan and rural secondary schools in 2001. Analyses of the data were performed using the Statistical Package for Social Science (version 10.7). Statistical procedures involved chi-square analysis, Student's independent *t*-test and univariate analysis of variance. Spearman's rank order correlation coefficient was used to describe the relationship between the secondary school student respondents' knowledge of and their attitudes toward breastfeeding.

The study results indicate that overall Western Australian adolescent secondary school students have less than ideal knowledge of breastfeeding which is consistent with findings from other studies. Higher breastfeeding knowledge scores were reported in year-12 for both male and female students. For both year groups, female students had higher breastfeeding knowledge scores than male students. With regards to attitudes toward breastfeeding, students had a tendency for neutral responses to attitude questions. However, overall and for both year groups, female students were found to be more positive towards breastfeeding than male students. The comparison of rural to metropolitan students found that metropolitan students had higher breastfeeding knowledge and were more positive towards breastfeeding than rural students. The metropolitan students were also more

inclined to consider breastfeeding future children than rural students. Consideration of breastfeeding future children was similar for both male and female students.

Comparison of the combination of gender, year and site revealed higher breastfeeding knowledge and more positive attitudes to breastfeeding in both rural and metropolitan female year-12 respondents. Sources of efficacy information, particularly persuasion/education, were more prominent in female secondary school respondents than male secondary school respondents when considering factors influencing adolescent attitudes toward breastfeeding. The adolescent's acceptance of gender identity could be argued as a reason for the more positive breastfeeding attitudes in female respondents. Students who were breastfed or exposed to breastfeeding either through role models (ie mothers), reading about breastfeeding, media or family influence had greater knowledge and were more positive towards breastfeeding.

This study suggests that breastfeeding and lactation information needs to be addressed in the early years of development in order to increase breastfeeding knowledge and promote positive attitudes. Information pertinent to the health benefits of breastfeeding needs to be included in health and nutrition education and addressed through targeted education programs. Education and health promotion activities could be guided using the four sources of efficacy information in relation to the benefits of breastfeeding. Opportunities for the role modelling of positive breastfeeding attitudes, and consistent support from the school-based health professionals may assist to reduce the adolescent student's unmet informational needs in relation to breastfeeding. A recommendation from this study is the provision of lactation and breastfeeding education for community-based high school nurses as these health professionals are a key element in health education and health promotion in the school setting.

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CHAPTER ONE

INTRODUCTION

This chapter serves to introduce a synopsis of the research. It includes the background to the study, the study aim, previous national and international research, the problem statement, objectives and significance of the study, and the limitations.

1.1 BACKGROUND TO THE STUDY

Breastfeeding is recognised and widely accepted as the optimal feeding method of infants and young children due to its multiple health benefits for infants, mothers and families (World Health Assembly, 2001; National Health & Medical Research Council, 2003). It is also an important public health issue as breastfeeding confers health advantages that persist into later life (Department of Health & Family Services, 1996), has economic benefits (Smith & Ingham, 1997) and poses no environmental cost (National Health & Medical Research Council, 2003). The World Health Organisation (WHO) recognises that there is a need to increase exclusive breastfeeding in infants to a minimum of six months of age and aims at promoting breastfeeding worldwide (WHO, 2003). The Australian breastfeeding rates reported by Donath and Amir (2000), following analysis of data from the 1995 National Nutritional Survey, indicated 81.8% of mothers exclusively breastfed on hospital discharge. A further 57.1% of mothers three months post discharge exclusively breastfed, with only 18.6% fully breastfeeding at six months. These rates are below the Health Goals and Targets for Australia's Health in the Year 2000 and Beyond that aims to have 50% of infants at six months of age being breastfed, with 80% of them being partially breastfed (Nutbeam, Wise, Bauman, Harris, & Leeder, 1993). When reviewing adolescent breastfeeding patterns, decreased incidence (Donath & Amir, 2000) and

shorter duration of breastfeeding were found among teenagers (Ineichen, Pierce, & Lawrenson, 1997a).

Various studies have indicated that positive and negative adolescent perceptions of breastfeeding were reflected in local breastfeeding initiation rates (Friel, Hudson, Banoub, & Ross, 1989; Ineichen et al., 1997a; Gregg, 1989). For example, communities in which adolescents regard breastfeeding positively were associated with higher breastfeeding initiation rates than communities where adolescents lack exposure to breastfeeding role models and were not aware of the benefits of breastfeeding (Pascoe & Berger, 1985; Yeo, Mulholland, Hirayama, & Breck, 1994). A lack of exposure to breastfeeding throughout childhood and adolescence may influence and contribute to lower breastfeeding initiation and shorter duration rates (Leffler, 2000). It has been reported that breastfeeding is under consideration during adolescence, and that increased exposure to breastfeeding seems to have a positive influence on subsequent attitudes toward and knowledge of breastfeeding (Cusson, 1985; Purtell, 1994; Green, Stewart-Knox & Wright, 2003).

Findings from various studies, including Australian studies, indicate that breastfeeding knowledge and attitudes are socially acquired within the family, social and educational background, thereby greatly influencing the decision to breastfeed (Purtell, 1994; Wambach & Cole, 2000). Adolescents struggle with their own psychosocial development in areas such as identity versus role confusion and peer group influence (Slee, 2002). It has been suggested that the adolescent's own emotional and social development also influences their attitude to breastfeed or formula feed infants (Wambach & Cole, 2000). Where positive breastfeeding influences are not present, the exposure to breastfeeding role models is deemed important for emotional and social orientation and for enhancement of the adolescent's efficacy belief or confidence in ability to breastfeed (Greenwood & Littlejohn, 2002). Efficacy belief or self-efficacy is a cognitive process that contributes to how individuals perceive their ability to perform specific behaviours and influence choice of and persistence with the behaviour (Bandura, 1977). Bandura's

(1977) self-efficacy theory may explain how the observation of significant others who are breastfeeding coupled with persuasion and education are important sources of efficacy information. “Attitudinal and behavioural changes are best achieved by creating conditions that foster the desired behaviour” (Bandura, 1997, p. 513).

Although knowledge can increase people’s awareness of the potential benefits of breastfeeding and hence alter their attitudes, self-efficacy theory addresses more than knowledge and attitudes (Bandura, 1997). In fact, Bandura considers it “...extremely difficult to get people to behave in ways that contradict entrenched attitudes” (1997, p.513). Rather, behaviour is regulated through efficacy beliefs about the person’s ability to breastfeed, perceived benefit if the behaviour is adopted, and perceived barriers preventing the adoption of the new behaviour or behavioural change.

Both adolescent males and females have been reported to hold common misconceptions of breastfeeding. These include misunderstandings concerning what constitutes an adequate milk supply or knowledge of the lactation process; a belief that breastfeeding encourages an over-dependency of the baby on the mother; the notion that breastfeeding is a time consuming activity; and the myth that breast size influences the ability of an infant to feed successfully (Dewan et al., 2002; Lauwers & Shinskie, 2000; Wambach & Cole, 2000).

Entrenched attitudes toward breastfeeding can be observed in societal beliefs. Adolescents, in particular, have been found to hold strong views about breastfeeding in public and concerning future infant feeding methods (Ellis, 1984; Goulet, Lampron, Marcil & Ross, 2003; Scott, Binns, & Arnold, 1997; Wambach & Cole, 2000). Those exposed to women breastfeeding or who were breastfed themselves are known to be more receptive to the idea of future breastfeeding (Cusson, 1985; Forrester, Wheelock, & Warren, 1997; Yeo et al., 1994). Furthermore, it has been demonstrated that girls with sound breastfeeding knowledge have more positive attitudes and are more inclined to breastfeed than those with inadequate knowledge (Cusson, 1985;

Friel et al., 1989). Thus, breastfeeding is more likely to occur when the adolescent has been exposed to breastfeeding in a supportive positive breastfeeding environment. Alternatively, breastfeeding is less likely in a non-supportive negative breastfeeding environment where there is a lack of awareness of breastfeeding benefits. However, what is not known is more recent breastfeeding knowledge of adolescent secondary school students, their beliefs concerning breastfeeding, and their perceived barriers for not wanting to breastfeed future children.

Adolescents consider embarrassment to be a major factor preventing them from wanting to breastfeed (Dewan, Wood, Maxwell, Cooper, & Brabin, 2002; Forrester et al., 1997; Gregg, 1989). Attitudes related to embarrassment and breastfeeding as a private behaviour may be associated with adolescent body image beliefs (Wambach & Cole, 1999). Self-consciousness and modesty may be so pronounced that adolescents are reluctant to consider breastfeeding (Benson, 1996). Most adolescents indicated that breastfeeding in public places was unacceptable although they would not be embarrassed if a woman breastfed in front of them (Scott, Binns, & Arnold, 1997). When comparing metropolitan and rural secondary school students, it was found that rural adolescents were more likely to see breastfeeding as natural and to accept discreet breastfeeding in public (Mackay, 1995).

Forrester et al. (1997) reported that adolescent secondary school students suggested education could change the embarrassment associated with breastfeeding. In contrast, other studies have shown adolescent views on breastfeeding to be shaped more by social and family attitudes rather than actual knowledge of breastfeeding benefits (Benson, 1996; Purtell, 1994). Nevertheless, education to correct breastfeeding misconceptions is an essential element in any endeavour to promote breastfeeding (Ellis, 1984; Kim, 1998; Leffler, 2000).

Adolescent secondary school students have also reported that they wanted more information than they obtained or received on breastfeeding (Purtell, 1994). It has been recommended that school-based interventions that

promote breastfeeding be encouraged, as the adolescent target group of both sexes is a captive audience (Gregg, 1989; Leffler, 2000). Leffler (2000) suggested that breastfeeding education might have lasting effects on subsequent adolescent choice to breastfeed.

A strategy suggested to promote breastfeeding information uptake is the use of audiovisual media. Audiovisual media is seen as an effective teaching tool for adolescents to increase knowledge (Berger, 1987) and the technology can be effective in promoting a positive breastfeeding attitude (Friel et al., 1989; Kapil, Bhasin, & Manocha, 1990; Kim, 1998). In one case, more positive adolescent breastfeeding attitudes were evident after a television adolescent breastfeeding campaign, indicating that positive breastfeeding information via mass media could influence adolescent beliefs (Friel et al., 1989).

It has been suggested that breastfeeding education and health promotion campaigns for adolescent males and females in early adolescence could be useful in promoting a greater acceptance of breastfeeding as the norm. Such campaigns may also reduce widely held breastfeeding misconceptions (Kim, 1998; Leffler, 2000).

Adolescent school-age students have previously been studied, both nationally and internationally, to evaluate their knowledge and attitudes toward breastfeeding (Cusson, 1985; Friel et al., 1989; Goulet et al., 2003; Purtell, 1994; Yeo et al., 1994). Australian studies conducted in the 1980s (Ellis, 1984; Wolinski, 1989) were the motivation for the current study as there is no information on adolescent male and female secondary school students' knowledge and attitudes toward breastfeeding in recent years. Previous Australian studies have included Ellis's (1984) study of 305 Australian Capital Territory female and male secondary school students and Wolinski's (1989) study of 94 adolescent male and female students from three Western Australian high schools. Both studies reported that the female students in the higher grades were more positive toward breastfeeding than male students and female students in the lower grades. It has been

suggested that developmental maturation might be the reason for adolescents in the higher grades, who are older, being more inclined to consider breastfeeding (Ineichen et al., 1997a). It has been many years since these studies were conducted. Thus, there is a need to re-examine both male and female secondary school students' knowledge and attitudes toward breastfeeding. Also, a need to include rural to metropolitan students' comparison as there is no known Australian comparison in this area. Contemporary information related to adolescents' knowledge and attitudes toward breastfeeding may provide a current platform to promote breastfeeding.

1.2 AIM OF THE STUDY

The aim of this study was to determine the knowledge and attitudes of adolescent students toward breastfeeding. The study explored the relationship between knowledge and attitude and students' exposure to breastfeeding practices.

This cross-sectional study was designed to survey Western Australian adolescent male and female secondary school students, both rural and metropolitan, regarding their knowledge and attitudes to breastfeeding. The study specifically investigated students in school years nine and 12 to provide an early and mid adolescence comparison.

1.3 PROBLEM STATEMENT

Research and available literature indicate that adolescents hold common misconceptions about breastfeeding that appear to result from their limited breastfeeding knowledge and varied attitudes (Wambach & Cole, 2000). This has led to a decreased incidence (Donath & Amir, 2000) and shorter duration of breastfeeding among teenagers (Ineichen et al., 1997a).

The purpose of this descriptive study was therefore to examine the knowledge and attitudes of adolescent males and females to breastfeeding. It was anticipated that the study would determine any unmet information needs of adolescents and highlight the health education requirements necessary to encourage a positive attitude and increase knowledge of breastfeeding for future reference in parenthood.

1.4 OBJECTIVES OF THE STUDY

Specific objectives of this study were to:

- determine year-nine and year-12 secondary school students' knowledge and attitude to breastfeeding;
- compare breastfeeding knowledge and attitudes between male and female year-nine, and male and female year-12 secondary school students;
- compare breastfeeding knowledge and attitudes between male year-nine and year-12 students, and female year-nine and year-12 secondary school students; and
- compare the breastfeeding knowledge and attitudes of rural and metropolitan secondary school students.

This study hypothesised that students in year-12 would have more knowledge of breastfeeding than year-nine students. Also anticipated was that males and females in year-12 would have more positive attitudes toward breastfeeding than males and females in year-nine.

It was also hypothesised that female secondary school students would have more knowledge and more positive attitudes toward breastfeeding than male secondary school students. The study also sought to determine factors that may influence the decision on future infant feeding methods. Also hypothesised was that rural students would have both more knowledge and more positive attitudes toward breastfeeding than metropolitan students.

1.5 SIGNIFICANCE OF THE STUDY

The importance of positive breastfeeding support from family and partner, and early breastfeeding education has demonstrated increases in breastfeeding initiation and duration rates (Landers, Hughes, & Graham, 1998; Scott, Aitkin, Binns, & Aroni, 1999). Increased adolescent breastfeeding knowledge in association with exposure to breastfeeding role models has shown to impact on adolescent attitudes toward breastfeeding in the future (Kim, 1998). With increased breastfeeding rates may come the significant physical, emotional and economic benefits that breastfeeding affords (WHO, 2003) and trend towards meeting the World Health Organisation recommendations on exclusive breastfeeding. The recommendation of the World Health Organisation is for exclusive breastfeeding for the first six months of life, and breastfeeding continuing with suitable complementary foods up to two years or beyond to enhance immediate and long-term health outcomes (WHO, 2003).

Australian research available in this area is limited. Hence, there is a need to replicate the American study by Cusson (1985) and to extend it to include male adolescent secondary students. There is increased evidence on the value in partner support for the breastfeeding woman (Littman, Medendorp, & Goldfarb, 1994; Sharma & Petosa, 1997). Since adolescent males have the potential to be future fathers, male adolescent secondary students' breastfeeding knowledge and attitudes to breastfeeding is deemed important to investigate.

Because there is a dearth of both national and international literature relating to adolescents' knowledge and attitudes to breastfeeding, the study is significant in that it provides much needed data. To promote future breastfeeding, education recommendations have been to include school children and adolescents with the aim to increase breastfeeding knowledge that would lead to positive attitudes in adolescents (Ineichen et al., 1999; Kim, 1998). The knowledge of adolescent secondary school student's breastfeeding knowledge and attitudes generated by this study may

contribute to and be useful for directing changes or improvement in breastfeeding education and health promotion.

1.6 LIMITATIONS OF THE STUDY

The researcher acknowledges that this research has limitations. Specifically, this study was restricted by personal and resource limits that are associated with the completion of a Master's thesis. Generalisability of the research to the population as a whole would be inappropriate due to the lack of random sampling, study design and the potential bias discussed below.

Random sampling did not occur as the self-report questionnaire was offered to all students who met the inclusion criteria but only in the schools that agreed to participate. It is also recognised that the use of a self-report questionnaire may reveal relatively superficial information (Polit & Hungler, 1999). However, the self-report questionnaire survey format was deemed the most appropriate method for this study because it provided the opportunity for both anonymous and confidential responses from students who may find the topic embarrassing and thus confronting, as evidenced in the literature (Polit & Hungler, 1999). The questionnaire also increased the likelihood of a non-biased response (Polit & Hungler, 1999). It was deemed by the researcher to be the most effective way to achieve anonymity for a sample of adolescent students.

A further limitation of the study was that the population sample was limited to male and female students in years nine and 12 who were able to read, write and speak English. It is acknowledged that Australia is a multicultural nation and therefore the configuration of school types and primary language spoken within the school community may vary. This research only focused on mainstream education centres where community-based high school nurses were employed, and students surveyed fitted the study inclusion criteria. Therefore, application of the findings will only be possible for those students

that meet the study's inclusion criteria and cannot be generalised to all Australian secondary school students.

1.7 OVERVIEW OF THE THESIS

This thesis is presented in five chapters. The first chapter has introduced the background to the study, objectives of the study and significance for health outcomes. Chapter two discusses the available literature on adolescents' knowledge and attitudes to breastfeeding and theoretical framework for the study. Chapter three describes the method used to conduct this study, outlines the study procedure and explains how the data were analysed. Chapter four presents the findings of the study, and includes discussion on instrument reliability and content validity. Chapter five discusses the results according to the objectives of the study and in relation to existing literature and theories. More specifically, the principle findings and implications for high school curricula are discussed in relation to self-efficacy theory. Finally recommendations for the study are provided.

CHAPTER TWO

LITERATURE REVIEW

This chapter explores known benefits of breastfeeding and the factors that influence breastfeeding duration and incidence. It includes adolescent breastfeeding knowledge and information sources. Adolescent attitudes toward breastfeeding and common adolescent breastfeeding misconceptions including embarrassment to breastfeeding are reviewed. Information regarding comparisons between rural and metropolitan secondary school students' attitudes and knowledge is outlined.

This chapter begins with the theoretical framework for the study. First, adolescent social maturational and cognitive changes with linkage to behaviour autonomy and influences of significant others on breastfeeding attitudes are discussed in relation to Erikson's theory. Second, the role the sources of efficacy information on behavioural choices is discussed.

2.1 THEORETICAL FRAMEWORK

Human development involves behavioural changes due to interaction of biology and environmental conditions. Adolescent biological development is revealed by physical changes such as rapid body growth with the primary focus for adolescents being body image and self (Slee, 2002). The physical changes have important effects on the social development and emotional behaviour of adolescents. The complex and variable interplay between physical onset of puberty and social maturation rates influences the levels of self-esteem and self-concept in both male and female adolescents (Williams & Currie, 2000). Erikson advocated that the transition from one stage to another comes about as a result of a combination of maturational changes, alterations in social structure and a person's cognitive abilities. Adolescent's cognitive changes rely on the capacity for abstract reasoning and logic in

thinking which is thought to occur in later adolescence (Slee, 2002). The fifth psychosocial stage of Erikson's theory of identity versus role confusion is where the developing adolescent is faced with physical and emotional changes, and role confusion based on doubts regarding sexual identity. Erikson emphasised the importance of the two central components of identity. These components include the finding of vocational identity and developing personal identity of beliefs and values (Kaplan, 2000; Slee, 2002). The resolution of confusion occurs through experimentation and by discovering values, attitudes and roles that adolescents feel comfortable with. As the adolescent moves toward behavioural autonomy, the opinions of their parents become less influential, with peers becoming increasingly influential in determination of activities, attitudes and behaviours (Kaplan, 2000). Role modelling of peers and societal influence on both peers and the adolescent themselves may contribute to the development of adolescents' values on issues such as infant feeding choices and breastfeeding.

However, the decision to change or adopt certain behaviour is thought to be determined by the person's level of confidence to change or adopt behaviour. Self-efficacy theory is based on the assumption that behavioural decisions are influenced by four sources of information that will contribute to an individual's confidence in his or her perceived ability to perform a particular task or behaviour (Bandura, 1977). The sources of efficacy information are identified as previous experience with the specific behaviour (enactive attainment or performance accomplishment), previous observation of the behaviour (vicarious experience), encouragement by significant others (verbal persuasion) and the associated emotional or physiological responses (Bandura, 1986). Efficacy information obtained from previous experience for an adolescent may be as a young parent. For an adolescent vicarious experience is gained by observing women breastfeeding their infants. Verbal persuasion such as the encouragement for breastfeeding is likely to be provided by an adolescent's own mother or peers. The adolescent's emotional or physiological responses will depend on what maturational and physical development stage the adolescent has reached. These sources of efficacy information all contribute to the adolescent's breastfeeding efficacy

belief. Efficacy beliefs are judgements about ability that have an important role in the adoption of specific behaviours (Bandura, 1997). In relation to this study, the vicarious experience of observational learning, social modelling, and verbal persuasion are considered important in developing confidence and positive beliefs in ability to undertake the behaviour (Anthanasou, 1999). Social persuasion and change requires the uptake of knowledge by the potential adopters (Bandura, 1997) in this case, adolescents. For the acquisition of desired behaviour, successive modelling is imperative and evidence of benefit is essential to gain acceptance (Bandura, 1977a, 1997). Various studies have supported the notion that breastfeeding knowledge and attitude are socially learned within the family; that social background greatly influences the decision to breastfeed; and that attitudes are well established before adulthood (Benson, 1996; Cusson, 1985; Ineichen et al., 1997a; Purtell, 1994; Wambach & Cole, 2000).

It is acknowledged that while breastfeeding behaviours can change attitudes to breastfeeding, whether positively or negatively, the adoption of breastfeeding behaviour is unlikely to occur if negative breastfeeding attitudes exist (Bandura, 1997). Knowledge, however, can be the precursor to a change in both behaviour and attitudes. Mediums such as television, films and other visual media have been shown to provide the vehicle for adolescent breastfeeding knowledge gain through symbolic modelling (Friel et al., 1989; Kim, 1998). Varied symbolic modelling has been proven to influence social attitudes, emotional responses and shape behaviour (Bandura, 1977). Symbolic modelling influences moral judgement development by what is portrayed as acceptable or non-acceptable conduct. This is relevant when considering the issue of breastfeeding in public. Verbal persuasion, also known as verbal modelling, via peer and societal influence also impacts on the adolescent's efficacy beliefs about breastfeeding to influence behavioural outcomes.

Thus, the theoretical framework that is useful to guide the findings of this study is Bandura's self-efficacy theory (1977). The current study is concerned with the knowledge and attitudes of adolescent students toward

breastfeeding. It elicits information on adolescents' observational learning and exposure to role models that have an impact on knowledge and attitudes to breastfeeding constructs.

2.2 BREASTFEEDING

The important health benefits of breastfeeding are widely acknowledged for the infant, the mother and the community (NHMRC, 2003). Breastfeeding provides optimal health, growth and development of infants. Exclusive breastfeeding has a preventive effect on the early development of allergic disease, with this protective effect being evident for multiple allergic conditions (Kull, Wickman, Lilja, Nordvall, & Pershagen, 2002). Breastfed infants have a reduced risk of illnesses and infections (Duncan, Ey, & Holberg, 1994), and have an increased cognitive ability (Horwood, Darlow, & Mogridge, 2001) particularly if born prematurely (Anderson, Johnstone, & Remley, 1999). Increased duration of breastfeeding has a significant benefit for child cognitive development (Quinn, O'Callaghan, Williams, Najman, Andersen, & Bor, 2001). Quinn et al. (2001) Queensland study of 3880 children investigated the relationship and effect of duration of breastfeeding in the first five years of life. The study revealed a clinically important and significant association between the duration of breastfeeding and child cognitive development at five years independent of social and parental factors. Breastfeeding may also contribute to long term positive effect on adult cognitive development and intelligence (Mortensen, Michaelsen, Sanders, & Reinisch, 2002).

Furthermore, there is evidence emerging that breastfed children may have a lower risk of diabetes, reduced systolic blood pressure at school age, and are less likely to become obese (Gillman et al., 2001) or develop heart disease later in life (Wilson, Forsyth, & Greene, 1998). Breastfeeding hormones aid in the infant-mother bonding process providing a sense of maternal wellbeing and increased self-esteem (Labbok, 1999).

In addition, breastfeeding protects the mother against haemorrhage through the release of oxytocin during breastfeeding, and against iron loss, as a result of lactational amenorrhoea and increased iron absorption in the gut during lactation (Labbok, 1999; Riordan & Auerbach, 1999). Studies have indicated that long-term breastfeeding lowers the risk of breast cancer (Labbok, 1999), ovarian and uterine cancers (Rosenblatt & Thomas, 1995) and reduces osteoporotic spinal and hip fractures (Clark, de la Pena, & Gomez, 1998).

Breastfeeding has been promoted internationally as the preferred choice of infant feeding with the recommendation that infants be exclusively breastfed until six months (WHO, 2003). This has seen an increase in breastfeeding rates in the developed world in the early 1980s following the marked decline experienced between the 1950s and the 1970s (Scott & Binns, 1999). In contrast, however, Lund-Adams and Heywood (1996) have suggested that Australian breastfeeding rates have in fact fallen since the mid-1980s. This was confirmed by Westmore's study (1995) that found breastfeeding rates in the state of Victoria were decreasing. More recently it was found that less than 20% of Australian mothers are exclusively breastfeeding their infants to the age of six months (Donath & Amir, 2000).

Although breastfeeding is perceived by many to be well established in the Western world, the duration of breastfeeding has declined worldwide in recent years (Scott & Binns, 1999). In relation to duration of breastfeeding, just over half of Australian babies are fully breastfed for greater than three months (Donath & Amir, 2000). One of the many postulated reasons for breastfeeding duration not having lengthened over time is a societal and family attitude toward breastfeeding (Raj, & Plichta, 1998; Scott & Binns, 1999). Researchers have consistently reported that more positive attitudes to breastfeeding have been associated with higher breastfeeding knowledge (Cusson, 1985; Kim, 1998), thus there is a responsibility to ensure that breastfeeding education is widely available.

2.3 BREASTFEEDING KNOWLEDGE

With reduced exposure of breastfeeding related to family structure and less observation of breastfeeding in the community, it has been suggested that there is a lack of knowledge concerning the art and physiology of breastfeeding. Wolinski (1989) surveyed 94 Australian adolescent male and female year 10 high school students in Perth, Western Australia. She reported that the students' scores on breastfeeding knowledge generally rated low to medium. The study also reported that there was no noticeable difference in the knowledge scores between the male and female students, however the sample was small. In contrast, Cusson's (1985) study of 68 female students found that female students in the higher school grade had higher breastfeeding knowledge than female students in lower grades. It was acknowledged in Cusson's study that twice as many students in the higher grades had read or heard about breastfeeding through attending childcare classes. The higher school grade female students, being more mature, may also have had a greater interest in breastfeeding information. Cusson reported that breastfeeding knowledge was positively related to attitude but not to exposure to breastfeeding role models. With more knowledge, attitudes were more positive. However, the sample size of Cusson's (1985) study was also small and did not include males. A different perspective postulated by Ellis's (1984) earlier study reported the responses of 305 Australian female and male students possibly reflective of a lack of breastfeeding role models. It was postulated that this lack of role models might be the reason for these students' heightened reservations about breastfeeding in social settings. The importance of breastfeeding role models to increase breastfeeding knowledge and promote positive attitudes toward breastfeeding has been supported by more recent studies (Greene et al., 2003; Kessler et al., 1995), and is therefore seen as a valuable breastfeeding information source.

2.3.1 Breastfeeding information source

When asked about the most useful information sources about parenting, more than 50% of 15 year olds in Stanton, Fisher and Calvert's (1996) study reported that family, relatives and friends were their main information source. One of the topics that the adolescent respondents requested more information on was breastfeeding, with this topic being selected more often by the females. Forrester, Wheelock, and Warren (1997) had similar findings. Their quantitative study using a pre and post test breastfeeding promotional campaign that surveyed 463 female high school students found that, although the sources from which students obtain information on breastfeeding varied, 67% of the students in their study received breastfeeding information from parents or siblings.

Purtell (1994) indicated in her study that the surveyed students wanted more information on breastfeeding. Similarly, Leffler (2000) recommended that school-based interventions promoting breastfeeding be encouraged, as the adolescent target group of both sexes are a captive audience. It was concluded that education may have lasting effects on their subsequent choice to breastfeed. Mackay (1995) encouraged the inclusion of adolescent males in school-based breastfeeding education as her study revealed fewer male students had seen breastfeeding and fewer males had been breastfed when compared to female students. It was suggested that the exposure to breastfeeding education for male students could assist them in supporting their future partners with breastfeeding. Partner support for breastfeeding women has been highlighted by various researchers as a major indicator for the initiation and duration rates of breastfeeding (Bar-Yam & Darby, 1997; Chapman, 1993; Sharma & Petosa, 1997). High incidence of breastfeeding was reported where the partner's strong breastfeeding approval exists (Littman et al., 1994). With this in mind, the current study has included male secondary school students because their knowledge of breastfeeding or lack there of could impact on their future partner's decision to breastfeed (Scott et al., 1997).

The decision to breastfeed including breastfeeding duration is greatly influenced by breastfeeding knowledge and the awareness of the potential benefits of breastfeeding (Leffler, 2000). It is postulated that the lack of adolescent breastfeeding knowledge is linked to limited exposure and access to relevant breastfeeding information and education on this subject (Friel et al., 1989; Kim, 1998; Mackay, 1995). For breastfeeding education various teaching formats are available, however, audiovisual media is seen as an effective teaching tool for adolescents (Berger, 1987). A school-based breastfeeding campaign to increase knowledge using this technology can be effective in promoting a positive breastfeeding attitude (Friel et al., 1989; Kim, 1998). Friel, Hudson, Banoub, and Ross (1989) used a pre and post test campaign survey to ascertain the effect of a breastfeeding campaign on adolescent knowledge and attitude of breastfeeding. The promotional campaign used television and newspaper commercials. The survey included 463 adolescent students with a mean age of 16 from an area in Canada with a low breastfeeding rate. They reported that the campaign positively influenced attitudes toward breastfeeding. However, only the television commercial was found to change attitudes. Forrester et al. (1997) supported the use of television as an educational tool to promote breastfeeding. More than half of the 590 Alabama students in their study, which assessed students' attitudes to breastfeeding, received breastfeeding information from television. Both studies (Forrester et al., 1997; Hudson et al., 1989) indicated that positive breastfeeding information via mass media campaigns using audiovisual format such as television could influence adolescent attitudes.

A combination of an audiovisual tool and a discussion panel was utilised in Kim's (1998) study where 207 of 412 Korean adolescent female students were exposed to a breastfeeding campaign to increase breastfeeding knowledge. The breastfeeding campaign consisted of a teaching session that included thirty-minute breastfeeding education videotape. A discussion panel of experts, which included several mothers who had breastfed, followed this. Kim reported that the participants in the intervention group demonstrated positive attitudes and norms toward breastfeeding and positive intentions to breastfeeding following the intervention. Friel et al. (1989) added that both

knowledge and attitudes toward breastfeeding improved with classroom exposure.

2.4 ATTITUDES TOWARD BREASTFEEDING

The initiation and duration of breastfeeding is influenced by factors such as breastfeeding promotion, societal support, family and partner attitude (Earle, 2000; Raj & Plichta, 1998; Wambach & Cole, 2000) as well as the social support network of friends (Tiedje et al., 2002). Purtell (1994) in a survey of 68 English schoolgirls and Leffler's (2000) study of 100 American teenage girls indicated that adolescent attitudes to breastfeeding were established well before adulthood. Purtell and Leffler suggested that these attitudes were influenced by childhood and adolescent exposure to societal and family attitudes. Similarly Hoddinott and Pill (1999) suggested that positive breastfeeding attitudes occurred through socialisation during childhood as a result of exposure to newborn infants and breastfeeding within the family and social environment where breastfeeding was seen as a norm. Greene, Stewart-Knox and Wright's (2003) study of 419 Northern Ireland teenagers aged 14 to 18 years also reported that exposure to breastfeeding was associated with positive attitudes toward breastfeeding and concluded that breastfeeding promotion should be introduced at an early age before negative attitudes were formed.

As exposure through socialisation influences culture, it is important for young females to be exposed to breastfeeding information and role models where positive cultural breastfeeding influences are not present (Greenwood & Littlejohn, 2002). Yeo, Mulholland, Hirayama and Breck (1994) supported the cultural influence after comparing attitudes toward breastfeeding of female Japanese high school students with those in the United States. Using a convenience sample, Yeo et al. found a more positive breastfeeding attitude was uniformly present amongst Japanese women (n = 242) with 90% of Japanese mothers reported to have breastfed their baby for the first month after birth. This study supported the notion that a strong cultural

breastfeeding norm reflected the social and family influence. A manual literature search (Ineichen et al., 1997b) of ethnic variation in United Kingdom's breastfeeding rates over several years, highlighted and supported the cultural influence. The comparison of Jewish and Celtic attitudes to breastfeeding revealed that urban Scotland had low rates of breastfeeding because of a lack of recent or historical tradition of breastfeeding within their society, where breastfeeding was seen as unfashionable. Whereas, for the Jewish community living in the United Kingdom breastfeeding was traditionally embedded as a norm and seen as desirable and was reflected in higher breastfeeding rates within this community. Similarly, an Australian study (Rice & Naksook, 2001) examined breastfeeding practices among Thai women in Australia. It was reported that the women in this minority ethnic group traditionally breastfed and thought that breastfeeding was the best infant feeding method. These studies indicated that the variations in breastfeeding rates among groups living in a similar environment were linked to cultural factors, influences of the individual ethnic groups and the social supports available.

Similarly, Tiedje et al.'s (2002) qualitative study, via a telephone survey of 95 first-time mothers supported the social network factor. The study respondents corroborated that the social support needed for breastfeeding continuation was obtained from friends and family who had positive attitudes and beliefs toward breastfeeding. Kessler, Gielen, Diener-West and Paige (1995) interviewed 133 randomly selected women and their significant others on infant feeding preferences and beliefs. Findings showed that infant feeding preference and the beliefs of significant others' greatly influenced a female's intention, initiation and duration of breastfeeding. The study suggested that the significant other was the person who mattered the most to her, and that this person should be included in education and health promotion interventions. Hence the need to investigate male knowledge and attitudes. The definition of significant other varied but has been broadly defined as a husband or a male partner, friends, family members and female's own mother (Kessler et al., 1995).

The adolescent's mother has been reported as an influential person in the decision to breastfeed and her approval was associated with breastfeeding initiation (Wambach & Cole, 2000). In particular, the adolescent's mother's experience (Dykes & Griffiths, 1998; Ineichen et al., 1997a; McIntyre, Hiller, & Turnbull, 2001a) and the adolescent's exposure to breastfeeding contributed to the decision to breastfeed (Cusson, 1985; Friel et al., 1989; Leffler, 2000). Leffler (2000) reported that although many adolescent females had considered infant feeding choices before planning motherhood, they had not yet made the decision on breastfeeding. The decision about infant feeding was often made at the beginning of pregnancy with partner involvement, rather than influenced by solely the female's own mother (McIntyre et al., 2001a). Other studies indicated that many young females are less likely to make a decision to breastfeed before their pregnancy, waiting till during pregnancy and sometimes even after the birth (Ineichen et al., 1997a; Maehr, Lizarraga, Wingard, & Felice, 1993). It is important for these decisions to be based on sound knowledge. Scott, Landers, Hughes and Binns (2001) reported that females who chose breastfeeding prior to pregnancy had a stronger desire and determination to breastfeed than those who did not consider infant feeding until later in their pregnancy.

Partner attitude and support has also been shown to greatly influence a female's intention to breastfeed (Bar-Yam & Darby, 1997; Chapman, 1993; Sharma & Petosa, 1997). Hauck, Langton and Coyle (2002) found that the female partner's emotional and physical support was important in the encouragement of breastfeeding. Some studies have shown partners to be supportive of the female's desire and right to breastfeed (Scott et al., 1997). Littman, Medendorp and Goldfarb's (1994) study of 115 postpartum mothers in Ohio reported a 98% incidence of breastfeeding where a female's partner strongly approved of breastfeeding. In contrast, other studies have shown the female's partner to be less supportive (Freed, Fraley, & Schanler, 1992). A major concern when trying to promote breastfeeding was the partner's lack of knowledge and awareness of the benefits of breastfeeding which has been shown to lead to possible negative attitudes and misconceptions toward breastfeeding (Sciacca, Dube, Phipps, & Ratliff, 1995).

2.4.1 Common adolescent misconceptions

Adolescent females and males both have misconceptions about breastfeeding that appear to result from limited knowledge and varied attitudes in regard to breastfeeding (Ellis, 1983; Scott et al., 1997; Wambach & Cole, 2000; Wolinski, 1989). Their attitudes toward breastfeeding were influenced by the adolescents' psychosocial developmental stage, with the primary focus being self. The self-consciousness, modesty and poor body image of adolescents struggling with their own growth and development influenced self worth (Riordan & Auerbach, 1999). Negative attitudes tended to focus on physical body image factors and personal inconvenience to their lifestyle concepts when considering breastfeeding (Hannon, Willis, Bishop-Townsend, Martinez, & Scrimshaw, 2000; Wambach & Cole, 2000).

The misconception that breastfeeding would alter the female body shape and that it had a tendency to encourage obesity was reported in Kim's (1998) study of Korean adolescent female students. The students exposed to the promotional breastfeeding campaign showed positive attitudes and norms toward breastfeeding, but the one-off campaign could not secure a positive attitude change concerning the effects of breastfeeding on body shape.

To add to the common misconceptions some adolescents believed that breastfeeding restricted adolescents' social lives and reduced their freedom. There was also a belief that breastfeeding encouraged an over-dependency of the infant on the mother (Lauwers & Shinskie, 2000; Wambach & Cole, 2000). Physiologically where choice exists there was an erroneous belief that formula feeding, also referred to as bottle-feeding, was just as good as breastfeeding, and this was reinforced where adolescents had been formula fed themselves (Purtell, 1994). A further misconception was that breastfeeding restricted what the adolescent mother ate (Hannon et al., 2000). Alternatively, others believe there was no restriction on what the adolescent mother ate (Mohrbacher & Stock, 1997). However, avoidance of alcohol, caffeine and fatty foods was recommended for all breastfeeding mothers regardless of the mother's age (Walker, 2002).

Ellis's (1983) quantitative study of 409 secondary school students in British Columbia reported that the majority of students believed that breastfeeding was an instinct rather than a learned behaviour. Added to this misconception was the belief that breastfeeding capability was related to breast size. Lack of understanding of lactation physiology and limited visible societal role models in breastfeeding only compounded this misconception. School-based breastfeeding educational programs that included physiology of lactation and covered sexual and social aspects of breastfeeding were encouraged (Scott et al., 1997; Wolinski, 1989). The inclusion of both males and females in these programs was important to dispel breastfeeding misconceptions, reduce embarrassment and to take advantage of the significant role the male partner played in influencing initiation and duration of breastfeeding (Scott et al., 1997).

2.4.2 Embarrassment towards breastfeeding

Embarrassment towards breastfeeding has been cited as a major issue facing adolescents (Forrester et al., 1997; Friel et al., 1989; Greene et al., 2003; Hannon et al., 2000). Most adolescents believed that breastfeeding in public places (Gregg, 1989) and in the presence of non-family males (Ellis, 1984) was unacceptable, and that it was a private activity (Wolinski, 1989). Scott, Binns and Arnold's (1997) qualitative analysis of breastfeeding in Perth found that adolescent females, when compared to older females and males, were least likely to approve of breastfeeding in public. The adolescent females had a preference for formula feeding when in public as breastfeeding was seen as embarrassing. The majority of 373 Australian participants in McIntyre et al.'s (2001a) study, which included mothers, fathers and grandparents, agreed that females were uncomfortable breastfeeding in public. Contact with newborns (Hoddinott & Pill, 1999; Greene et al., 2003), and peer-age-group breastfeeding role models (Podgurskie, 1995) may provide exposure to the reality of breastfeeding and thus reduce the embarrassment toward breastfeeding. Forrester et al.'s study to explore perceptions of breastfeeding reported that the majority of students, 346 high school students and 244 college students in Alabama, thought education

could influence the embarrassment associated with breastfeeding. This supported the earlier findings by Gregg of 400 Liverpool school students aged 14 and 15 years where 97% of the students agreed that better breastfeeding education for both sexes would encourage females to breastfeed, and open discussion could reduce embarrassment. Wolinski's Australian research study also recommended educational programs that included breastfeeding role models for both male and female students to help dispel breastfeeding misconceptions and reduce embarrassment. Similarly, McIntyre et al. (2001b) emphasised the use of media to increase breastfeeding promotion. The use of pictures on breastfeeding and an increase in breastfeeding articles may encourage greater acceptance of breastfeeding in public, reduce the issue of embarrassment and normalise breastfeeding.

2.5 COMPARISON OF RURAL AND METROPOLITAN STUDENTS' BREASTFEEDING KNOWLEDGE AND ATTITUDES

Published research on the differences in breastfeeding knowledge and attitudes toward breastfeeding among rural secondary school-aged students is limited. However, MacKay (1995) found that overall rural students were more likely to be breastfed than urban children, and more likely to see breastfeeding as natural and healthy for babies. Rural students were also more likely to accept discreet breastfeeding in public and more inclined to want their own babies to be breastfed. MacKay surveyed rural and urban primary and secondary school-aged students on their attitudes to breastfeeding, but reported difficulties in obtaining a balance in the types of schools for the study. There were 117 primary students and 188 secondary school students surveyed. Of the secondary school students, 84% had witnessed breastfeeding and 96% had seen formula feeding, which indicated that slightly more students had been exposed to formula feeding. Two-thirds of the secondary school students accepted discreet breastfeeding in public, with the rural secondary students indicating breast and formula feeding combination when in public was best.

2.6 SUMMARY

Early studies that explored adolescent knowledge and attitudes to breastfeeding have not sought to place their findings within a theoretical framework. However, it could be argued that the theoretical framework that explains many of the findings from these studies is Bandura's (1977) self-efficacy theory, which is the chosen theoretical framework for this study. Of particular importance to this study is that observation of significant others may be an important source of efficacy information. The resultant combination of maturational changes, alterations in social structure and the adolescent's cognitive abilities (Erikson, 1968), coupled with exposure to efficacy information sources may enhance desired behaviour.

Findings from various studies indicated that breastfeeding knowledge and attitudes were socially acquired with the family, social and educational background greatly influencing the decision to breastfeed. The decision to breastfeed was often made prior to pregnancy (Leffler, 2000; Wiemann, DuBois, & Berenson, 1998). Other studies, however, have indicated that many young females did not make a decision to breastfeed before their pregnancy, with some not deciding until during or even after the birth (Ineichen et al., 1997a; Maehr et al., 1993). Researchers have indicated that adolescent knowledge of breastfeeding is limited and appears to be associated with commonly held misconceptions about breastfeeding (Cusson, 1985; Wolinski, 1989). Embarrassment toward breastfeeding in public was indicated as a major issue influencing adolescents' attitudes, and this may be related to adolescent body image beliefs and reduced exposure to breastfeeding models (Wambach & Cole, 2000).

Social modelling was also reflected in the influence of health education and health promotion in the school setting. Discussion of the benefits and advantages of breastfeeding, addressing the misconceptions and the social-cultural issues adversely influencing breastfeeding rates, were likely to induce adolescents to form positive attitudes toward breastfeeding. Furthermore, breastfeeding education may assist adolescents in their

decisions to choose breastfeeding for their future children (Friel et al., 1989; Kim, 1998).

With limited research available on comparisons of rural and metropolitan students' breastfeeding knowledge and attitudes there is a need for further research in this area. Other areas of interest include addressing the limited research on breastfeeding knowledge and attitudes in male and female adolescent students in recent times. Studies that have reported on female only samples as well as both female and male adolescent students' breastfeeding knowledge and attitudes were conducted in the mid to late 1980s (Cusson, 1985; Ellis, 1984; Friel et al., 1989; Gregg, 1989). Studies in the mid to late 1990s focused more on male partner knowledge and attitudes toward breastfeeding. Plus women who are or have breastfed and not on where adolescent breastfeeding knowledge and attitudes were formed (Littman et al., 1994; Sciacca et al., 1995; Scott & Binns, 1999). There is a need to replicate Cusson's study and extend the study to include male secondary school students in light of the results of more recent studies, on the role of partners in breastfeeding decision making. Hence, the impetus for the current study is to provide information on today's adolescent secondary school students' knowledge and attitudes of breastfeeding that includes male and female, rural and metropolitan students in a large quantitative Australian study.

Chapter three describes the study design and data collection methods. It also describes the data analyses that will be used and the ethical considerations.

CHAPTER THREE

METHOD

This chapter describes the method used to conduct this research. It begins with a brief introduction, a description of the study design, sample size and sampling methodology. The details of the instrument used are discussed with reference to previous internal consistency scores for the scales utilised in this study. The study procedure is outlined and data analyses are explained. Ethical considerations for this study are addressed.

3.1 INTRODUCTION

The purpose of this research was to determine knowledge and attitudes toward breastfeeding among adolescent secondary school students. Year-nine and year-12, rural and metropolitan school students, were involved in the study. Data collection took place at the end of the second secondary school term and the beginning of the third secondary school term in 2001.

The specific objectives of this study were to:

- determine year-nine and year-12 secondary school students' knowledge and attitude to breastfeeding;
- compare breastfeeding knowledge and attitudes between male and female year-nine, and male and female year-12 secondary school students;
- compare breastfeeding knowledge and attitudes between male year-nine and year-12 students, and female year-nine and year-12 secondary school students; and
- compare the breastfeeding knowledge and attitudes of rural and metropolitan secondary school students.

Year–nine and year 12 secondary school students were used as the focus of this study to explore any shift in breastfeeding knowledge and attitudes between these two distinct year groups. Year-nine students were selected as this group of students are early adolescent whereas year 12 students are in the latent phase of adolescence.

3.2 STUDY DESIGN

The research involved a descriptive cross-sectional design. The study, using a questionnaire, allowed for concurrent comparison of male and female, year-nine and year-12, rural and metropolitan school students. Independent variables thought to influence the outcome included gender, age, type of school attended, year of schooling, ethnic background, students' parent education and occupation.

With limited resources and time constraints, the use of a self-report questionnaire was deemed appropriate (see Appendix 1). It was considered to be the most cost effective way of gathering data from a large number of rural and metropolitan students whilst minimising disruption to the school system. The use of the questionnaire allowed the researcher to include five secondary schools in the metropolitan area and extend the study to include rural students both in the West Pilbara and Bunbury health regions of Western Australia.

3.3 SAMPLE AND SAMPLING METHODOLOGY

Purposive sampling methodology was used to recruit year-nine and year-12 school students from metropolitan and rural secondary schools. Both public and private secondary schools in the Fremantle Health Service, West Pilbara Health Service and the Bunbury Health Regions were invited to participate in the study. Participation of the schools was dependent on the approval from the school Principal who gave permission for students to participate in the

study. This approval was deemed essential due to the duty of care the Principal has for the students in the school setting. Parents were informed about the study through the school's newsletter (Appendix 2) and were given the opportunity to object to their children participating. Students whose parents objected were not included in the survey. Once approval was obtained students who met the inclusion criteria were invited through an information letter (Appendix 3) to complete the questionnaire. The inclusion criteria for the study were male and female secondary school students in year-nine or year-12, who were able to read, write and speak English. Completion of the questionnaire by the student was acknowledged as implied consent.

The researcher targeted secondary schools that had contact with community-based high school nurses, as these nurses were situated in the school settings and were needed for assistance throughout the research project. The class numbers were obtained from the enrolment register for each year-nine and year-12 class in each participating school. Each community-based high school nurse who agreed to assist the researcher was given the exact number of questionnaires according to student numbers in each participating class. This allowed all students who met the study criteria to access the questionnaire. It also enabled the researcher to assess the percentage of students who did not complete the questionnaire. Two thousand, three hundred and thirty-one questionnaires were sent to the participating high school nurses for distribution to students in year-nine and year-12.

3.3.1 Sample size justification

The Australian Bureau of Statistics (ABS) for 2001 reported 27,349 students in year-nine and 19,545 students in year-12 in Western Australia (ABS. Cat 4001.0) a total of 46,894 students for these two school years. These data were used to determine the necessary sample size in conjunction with the sample size and confidence interval calculator ('Creative Research Systems' <http://www.surveysystem.com/sscalc.htm>) to estimate the required sample

size. It was revealed that to achieve a 95% confidence level with a confidence interval of 3 a sample size of 1067 would be required.

This sample size of secondary school students was deemed sufficient for statistical analysis and exceeded the necessary sample size as outlined by Nunnally (1978) who indicated a need for 30 cases per independent variable. The opportunity to take advantage of chance is related positively to the number of variables. Nunnally and Bernstein (1994) suggested that studies include at least twice as many subjects as items and that at least 200 subjects are included to minimise the role of chance. Hence, a minimum sample size of 1067 was deemed adequate for this study.

3.4 INSTRUMENT

The questionnaire used in the study consisted of four sections that included demographics, breastfeeding knowledge, attitudes toward breastfeeding, and general questions (Appendix 1). The self-report questionnaire was designed to collect information on adolescent secondary school students' breastfeeding knowledge and attitudes, breastfeeding information sources and their intention to breastfeed in the future. Both closed and open-ended questions were utilised in the questionnaire.

Section one consisted of ten demographic questions. These included participants' age, gender, current year at school, school type and ethnic background. In addition, this section included questions regarding the educational level of the student's mother and father and the parent(s)' occupation type if known.

Section two, three and four of the questionnaire included the Breastfeeding Knowledge (BFK) and Attitudes Toward Breastfeeding (ATBF) scales and nine of Cusson's (1985) general questions. Written permission was sought and obtained from Regina Cusson (personal communication, February 13th, 2001) to use the scales and general questions for this study.

Section two examined students' breastfeeding knowledge. The 20-item BFK scale (Cusson, 1985), to measure a lay person's basic breastfeeding knowledge, used multiple-choice questions. The knowledge scores were calculated by giving a value of one to each respondent's correct answer, with a possible correct knowledge score of 20. This scale is binomial for correct and incorrect knowledge score. The questions in this section centred on composition of breast milk, colostrum benefit and definition, transmission of substances into breast milk, immunology and physiology relating to breastfeeding, maternal dietary requirements, comparison of breast milk with that of commercial formula, breastfeeding advantages and benefits, weaning and introduction of solids. The BFK scale had been used in previous research projects with adolescents and the instrument was found to be valid and reliable (Friel et al, 1989; Wolinski, 1989). In Cusson's study of 68 high school students, the knowledge scale achieved, using the Kuder-Richardson formula (KR-20), .62 for internal consistency, and was considered satisfactory. For this current study content validity of the instrument used by Cusson (1985) was verified by a panel of several breastfeeding experts.

In section three, the 18-item ATBF scale (Cusson, 1985) was utilised to measure important facets of adolescent attitudes. The attitude questions in the questionnaire centred on convenience, skills and emotional and physical aspects of infant feeding. A five point Likert scale was used to rate responses with five possible choices: 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree and 5 = strongly disagree. Five was the most positive response and one the most negative response. The possible scores ranged from 18 to 90. To ensure that the higher the score the more positive the attitude, 10 of the statements used in the attitude section that were framed negatively were reverse scored. A median split was used to differentiate between groups with positive and negative attitudes. The reliability of the ATBF scale was assessed previously using the Spearman-Brown Corrected Split Half (odd-even) Index. A result of .83 was again considered satisfactory reliability (Cusson, 1985).

Section four contained fourteen general questions of which nine were breastfeeding questions replicated from Cusson's (1985) study. These questions centred on respondents' exposure to breastfeeding, their intentions regarding future breastfeeding and significant factors influencing their attitudes toward breastfeeding. With permission granted from Suzan Banoub (personal communication, January 13th, 2001), four questions used in previous research replicating Cusson's study were added to accommodate student participants who had become parents (Friel et al, 1989). These questions were centred on adolescent parents' infant feeding choice. The question format used yes, no or uncertain responses. One open-ended question sought information about any significant factors the students could identify that would influence their attitudes toward breastfeeding and their intention of breastfeeding any future children.

3.4.1 Content validity

Prior to the main survey, a panel of twelve expert nurses reviewed the adolescent knowledge (BFK) and attitudes to breastfeeding (ATBF) items. They included community-based high school nurses and lactation consultants who reviewed the questionnaire for clarity and content validity to ensure suitability in the Australian culture. Although this study replicated Cusson's (1985) research, a small pilot test was conducted to verify that the total questionnaire was appropriate for use with the current generation of Australian adolescents and was adolescent friendly.

3.4.2 Pilot survey

A convenience sample of ten adolescent students from a school not included in the main survey was used to recruit subjects for the pilot survey. The questionnaire was given to ten adolescents, aged thirteen to seventeen. The pilot group also allowed the researcher to assess a realistic questionnaire completion time. Changes to the survey were minimal and included reordering of the original socio-demographic background questions used in

Friel et al.'s (1989) study plus the omission of a question on adolescent smoking.

Subsequently, an unfamiliar word 'quart' was found in the questionnaire, unfortunately overlooked by both the expert panel and the pilot participants. As there was no opportunity for retrieval of the distributed questionnaires, a decision was made to give an explanation of 'quart' to each group of participants prior to their commencement of the survey.

3.5 PROCEDURE

Community-based high school nurses in designated metropolitan health services were informed of the proposed study at their clinical meeting and were invited to be involved in the study. Senior community health nurses in the West Pilbara and Bunbury Health regions were approached directly via telephone to request their assistance in recruiting high school nurses from their rural areas to assist in the research. It was essential to obtain the assistance of community-based high school nurses to recruit subjects who qualified for inclusion in the study, because they were based in the secondary school settings and had personal contact with each school Principal and the relevant teachers. Their involvement was deemed necessary to provide support to Principals, teachers, students and parents in the appropriate school years. They also needed to obtain individual Principal's consent to participate and to act as a vehicle for distribution and collection of the study's questionnaires.

The nurses who agreed to assist with recruitment were instructed by the researcher on the data collection process and given a flow chart to follow. A letter was written for them to give to the Principal when asking permission for their school to be involved. These nurses were responsible for obtaining the Principal's consent (Appendix 4) and for ensuring that the breastfeeding survey information letter (Appendix 2) was included in the school's newsletter for parents. The breastfeeding survey information letter included in the

newsletter outlined the purpose and benefits of the research and provided contact details of the researcher for parents who required further information. Parents were able to refuse permission for their child to participate. Through negotiation with the school Principal and the relevant student class teachers, consenting students were allocated time in class to complete the questionnaire. The nurses liaised with the teachers and assisted with the distribution of questionnaires and student information sheets (Appendix 3) for participating students. The student information sheet introduced the researcher, the purpose of the study and the student's involvement. It also included information on voluntary participation and withdrawal from the study. Data collection took place at the end of the second and the beginning of the third secondary school terms in 2001. The actual data collection date varied across the participating schools in consideration of each individual school's curricula, such as school sports and camp activities. However, in each individual school the questionnaires were given out to students on the same day and at approximately the same time to enable data collection to occur simultaneously. This was to reduce sharing of information and discussions between students from different classes during change over of classes and at designated student breaks. The questionnaire took approximately 20 minutes to complete. On completion of the questionnaires the nurses collected them and sent all the questionnaires back to the researcher. Each returned questionnaire was given a site identification number to identify school locations. The researcher checked all returned questionnaires for completeness.

3.6 DATA ANALYSES

Upon completion of the data collection, all questionnaires were coded ready for data entry. The Statistical Package for Social Science (SPSS) version 10.7 was used to facilitate analysis of the data from all of the completed self-administered questionnaires. The *explore* command was used to assess violations of normality of distribution. Descriptive statistics were used to

analyse the demographic data. The mean and standard deviation were calculated for knowledge and attitude scores.

Nonparametric chi-square analysis was used to test nominal variables. For example, significant differences between groups such as male and female students, rural and metropolitan students and year-nine and year-12 students with regard to factors influencing the students' attitudes toward breastfeeding. Spearman's rank order (ρ) correlation was utilised to describe the overall relationship between the secondary school student respondents' knowledge of and their attitudes toward breastfeeding. Mann-Whitney U and Kruskal-Wallis tests were used to examine the possible differences in the respondents' breastfeeding knowledge and attitude scores where normality for distribution was not assumed in relation to demographic variables.

For inferential statistics the significance level was set at .05. Student's independent samples t -test was used to make comparison between two groups. Univariate analysis was used to make multiple between-group comparisons. Utilisation of pooled-variance t -tests occurred with the assumption of equal population variance and separate-variance t -test with non-acceptance of the equal-variance estimates. Equality of variance for parametric bivariate analysis was tested using the Levene test in which a significant Levene's statistic greater than .05 equates to equal variance and less than .05 unequal variances. Univariate analysis of variance (ANOVA) was utilised to compare within-subject means for multiple comparisons, and to avoid a Type 1 error a Tukey's honestly significant difference (HSD) test was employed.

Scale reliability was assessed using Cronbach's alpha, as it is deemed an accurate method of computing internal consistency estimates and is a widely used method (Polit, Beck, & Hungler, 2001). According to the Statistical Package for Social Science (SPSS) version 10.7, for dichotomous data Cronbach's alpha is used instead of the Kuder-Richardson (K-R 20)

coefficient as the K-R 20 is equivalent to Cronbach's alpha testing (SPSS Inc, Chicago, IL, 2001).

3.7 ETHICAL CONSIDERATIONS

This study was conducted in accordance with the National Health and Medical Research Council's National Statement on Ethical Conduct in Research Involving Humans. Approval to conduct the study was obtained from the Human Research Ethics Committee of Curtin University, Fremantle Hospital Human Research Ethics Committee and from the Education Department District Offices for Karratha, Bunbury and Fremantle. Ethical principles of beneficence, respect for human dignity including self-determination, right to privacy and anonymity and informed consent were considered.

Written formal consent (Appendix 4) for the study was obtained from Principals in participating schools. Principals are responsible for the duty of care regarding students in the school setting and therefore were able to consent to student participation. The high school nurses placed an information letter provided by the researcher regarding the breastfeeding research in each school's newsletter. Parents were given the opportunity to object to their children participating in the project and these students were not included in the survey. A student information sheet (Appendix 3) outlining the purpose and potential benefits of the study and anonymity and confidentiality aspects was given to each participating student prior to completing the questionnaire. Students were informed that they did not have to participate, were free to withdraw from the study with no adverse consequences and informed that any information collected would be destroyed if requested. Completion of the questionnaire by the students was deemed implied consent.

Assurance of anonymity and confidentiality were maintained by the use of codes, and the utilisation of an identification number to identify participating

schools only. Individual student names were not required nor requested for this study. Once the questionnaires were completed and collected by the high school nurses, they were placed into a box provided and sealed for delivery to the researcher. The rural questionnaires were sent to the researcher in sealed boxes by courier. All data, both questionnaires and relevant computer data files, will be kept in a secure place at Fremantle Community Health Service for five years from the date of completion. After this time all data will be destroyed.

3.8 SUMMARY

This chapter has described the study design to assess the knowledge and attitudes of adolescent secondary school students toward breastfeeding. Specifically, a descriptive, cross-sectional study design with a purposive sampling methodology was employed to recruit students from metropolitan and rural secondary schools. A sample size and confidence interval calculator confirmed that the minimum sample size of 1067 was adequate for this study. The reason for the utilisation of a self-report questionnaire to survey the adolescent secondary school students was explained. The current study's questionnaire content was outlined. The reliability of the two Cusson's (1985) scales from previous studies was discussed. Study procedure and data analyses were detailed. Ethical considerations and approval to conduct the study were also discussed in this chapter. In the next chapter, the results of the survey will be reported.

CHAPTER FOUR

RESULTS

This chapter presents the findings of the study to determine selected adolescent secondary school students' knowledge and attitudes toward breastfeeding. The demographic characteristics of the participants and the findings of the research objectives are reported. The instrument reliability and content validity are discussed.

4.1 INTRODUCTION

A full description of the data analysis was given in section 3.6 in chapter three. All default settings were retained. Statistics included descriptive and inferential tests, parametric statistic Student's independent samples *t*-test and univariate analysis. A significance level of alpha equal to .05 was set for all statistical tests.

4.2 SAMPLE

Secondary school students who responded to the survey and completed the adolescent knowledge and attitudes to breastfeeding questionnaire numbered 1845 from the 2,331 questionnaires sent out to the selected participants. This represented a 79% response rate from secondary school students who were eligible to participate in the study. As the response rate was over 60%, the risk of serious response bias was considered negligible (Polit & Hungler, 1999). Student absenteeism on the day of data collection was suggested by participating high school nurses as one of the main reasons for non-completed questionnaires. As well, some students chose not participate in the study.

Of the 46,894 Western Australian students in year-nine and year-12 in 2001, the participation of 1845 students from year-nine and year-12 in this study represented 4% of the school population. There was a relatively even spread of male and female students in the study with both genders represented in similar proportions for the rural and metropolitan study sites (Table 4.1).

Table 4.1 Secondary students' questionnaire response rate

Site	Male		Female	
	n	%	n	%
Rural	241	13.0	259	14.0
Metropolitan	659	35.8	686	37.2
Total	900	48.8	945	51.2

4.2.1 Sample size justification

The sample size and confidence interval calculator (Creative Research Systems <http://www.ncs.com/ncscorp/research/calc.htm>) was used to calculate and report confidence intervals as shown in Table 4.2.

Table 4.2 Confidence interval

Confidence interval if population and sample size are known ($p = .5$)

Population Size:	46894		
Sample Size:	1845		
	Confidence Interval (+/-)		Uncorrected
@90% Confidence:	1.9 %		1.9 %
@95% Confidence:	2.2 %		2.3 %
@99% Confidence:	2.9 %		3 %

In Table 4.2, when reviewing the 95% confidence level for the sample size of 1845, the calculations revealed a 2.2% confidence interval. This indicated that if the same survey was conducted a further 100 times, 95 out of the 100

administrations should yield results within +/- 2.2% of the current results. As the sample size of 1845 exceeded the estimated sample size of 1067, a sample size of 1845 was deemed adequate for further analyses.

4.2.2 Sample distribution

Normality of the distribution for breastfeeding knowledge and attitude scores was assessed using histograms in conjunction with the measurements of skewness and kurtosis that are sensitive to anomalies in the distribution (SPSS Inc, 2001).

The knowledge score graph shown in Figure 4.1 indicated that the shape of the histogram is symmetric. The values (skewness = -.22; kurtosis = -.05) lie within ± 2.5 for a .01 probability of error level and therefore normality of distribution was assumed (Hair, Anderson, Tatham, & Black, 1998; Tabachnick & Fidell, 1996). As the sample size was greater than fifty the Kolmogorov-Smirnov (with Lilliefors correction) test, a formal statistical analyse for normality, was utilised. The Kolmogorov-Smirnov significance level for knowledge score was greater than .05 therefore normality was assumed.

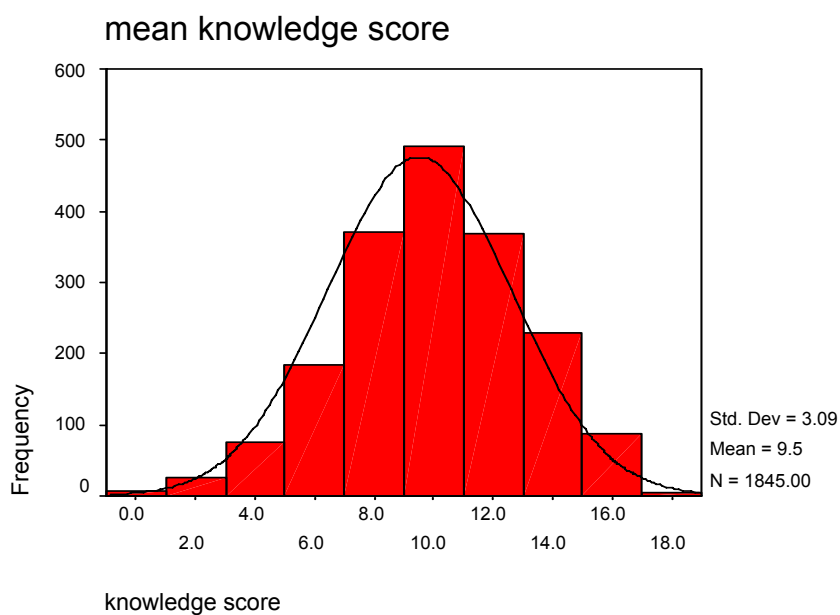


Figure 4.1 Knowledge score graph

The attitude distribution graph shown in Figure 4.2 indicated symmetry around the vertical axis (skewness = $-.64$) but normality of distribution could not be assumed because of the leptokurtic shape (kurtosis = 6.96). Also the Kolmogorov-Smirnov significance level for attitude score was less than $.05$ and normality was not assumed. As attitude scores were not normally distributed, the nonparametric Mann-Whitney U and Kruskal-Wallis tests were utilised, in further analyses.

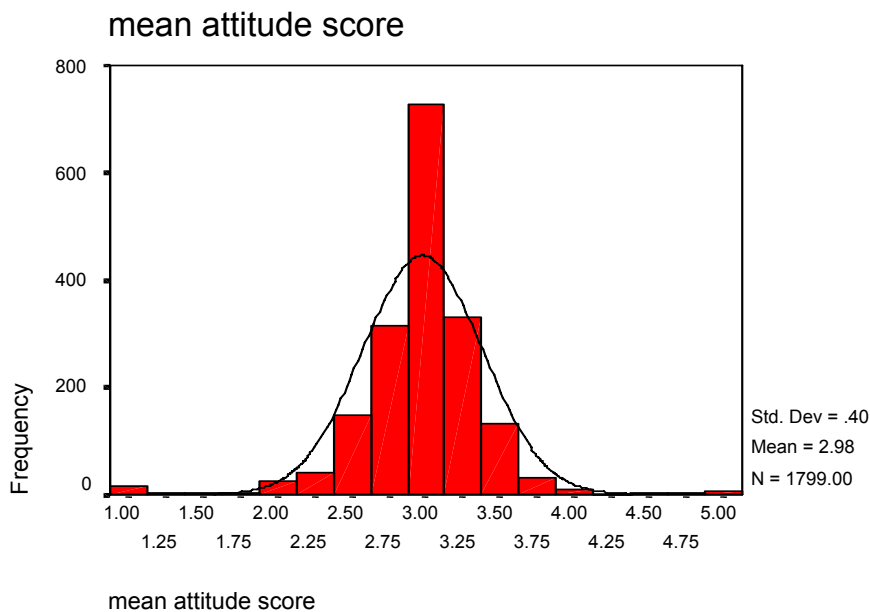


Figure 4.2 Attitude score graph

4.3 SAMPLE DESCRIPTION

The sample consisted of 1845 secondary school students who met the inclusion criteria. Nearly half the respondents were male ($n = 900$, 48.8%), with the remainder being female ($n = 945$, 51.2%). Rural students represented 27% ($n = 500$) of the sample population and the remaining 73% ($n = 1345$) were metropolitan secondary school students.

Respondents were from State Government schools ($n = 1753$, 95%) or a Catholic private college ($n = 92$, 5%), with approximately two thirds of the students attending schools in the Perth metropolitan area of Western Australia. The year-nine students formed the biggest student group ($n = 1083$, 58.7%), with year-12 representing 41.3% ($n = 762$) of students in the study. The largest number of respondents' were in the 13 to 14 year age group ($n = 1013$, 54.9%) in year-nine. Approximately a quarter of the sample were in the 17 year old age group ($n = 463$, 25.1%) and 11.9% ($n = 219$) were in the 16 year old age group.

The educational level of the respondents' parents was reported according to the Australian Bureau of Statistics (ABS) 2001 census data for non-school qualifications. The students' fathers' educational level (Appendix 5) was mainly university degree ($n = 434$, 23.5%) or apprenticeship/trade ($n = 417$, 22.6%), followed by high school education level ($n = 377$, 20.4%). On the other hand, the results revealed the students' mothers (Appendix 6) were mainly educated to high school level ($n = 610$, 33.1%), followed by university education level ($n = 455$, 24.7%). A high percentage of respondents were unsure of the educational level of their fathers ($n = 462$, 25%) or mothers ($n = 535$, 29%).

The employment status of fathers and mothers in Table 4.3 indicated that the majority of the respondents' fathers ($n = 1596$, 86.5%) and mothers ($n = 1264$, 68.5%) were employed. More mothers ($n = 527$, 28.6%) than fathers ($n = 118$, 6.4%) were reported as unemployed. Parental retirement was reported in 0.7% ($n = 12$) of fathers and in 0.2% ($n = 3$) of mothers. A small percentage of students reported that they did not have a father ($n = 80$, 4.3%) or a mother ($n = 29$, 1.6%) and fewer still did not state their father's ($n = 39$, 2.1%) or mother's ($n = 20$, 1.1%) occupation.

Table 4.3 Employment status of respondents' parents

STATUS	Father		Mother	
	n	%	n	%
Employed	1596	86.5	1264	68.5
Unemployed	118	6.4	529	28.7
Retired	12	.7	3	.2
Not applicable	80	4.3	29	1.6
Not stated	39	2.1	20	1.1
Total	1845	100.0	1845	100.0

The students' parent occupation classifications were divided into nine main categories according to the categories used by the Australian Bureau of Statistics census data (2001). The occupation of the fathers (Appendix 7) was predominantly tradespersons and related workers ($n = 370$, 20.1%) and managers and administrators ($n = 323$, 17.5%). Mothers' occupations (Appendix 8) were predominantly reported as professional ($n = 301$, 16.3%) and elementary clerical, sales and service workers ($n = 284$, 15.4%). Additional categories of 'do not know', 'student' or 'not stated' were included. Respondents' parents occupations were not stated for 32.7% ($n = 604$) of mothers and 15.7% ($n = 290$) of fathers.

Again the categories used by the Australian Bureau of Statistics census data (2001) were used to classify students' ethnic background. More than 70% ($n = 1415$) of the respondents indicated that their ethnic background was white Caucasian, with 11.5% ($n = 213$) of participants reported as Asian and 2.9% ($n = 53$) Australian Aboriginal. A further 1.4% ($n = 37$) were Middle Eastern, 1.2% ($n = 23$) Black African, and 6.3% ($n = 116$) reported as being in 'other group' (Table 4.4). This 'other group' included Maori, South African, South Americans, mixed European and Middle Eastern, Indians, Central Americans, mixed European and Mauritius, and Japanese origin.

Table 4.4 Ethnic background of respondents

ETHNIC BACKGROUND	n	%
White Caucasian	1415	76.7
Asian	213	11.5
Australian Aboriginal	53	2.9
Middle Eastern	25	1.4
Black African	23	1.2
Other	116	6.3
Total	1845	100

Overall, the study sample was predominantly white Caucasian with slightly more females than males, majority of students in year-nine, and more were from Metropolitan State Government secondary schools. Respondents' parent occupations were predominantly tradespersons for fathers and professionals for mothers, with the majority of parents being employed.

4.4 INSTRUMENT RELIABILITY AND VALIDITY

Clarity of the instrument and content validity of the four sections used in the questionnaire was verified by a panel of twelve expert nurses that included community-based high school nurses with knowledge of breastfeeding and lactation consultants with specialist knowledge. Cronbach's coefficient alpha was used to assess scale internal reliability for the two scales used to collect data on the variables of interest. The Cronbach's alpha for the BFK scale was minimal ($\alpha = .33$) for this sample of secondary school students. When knowledge in a variety of areas or contexts, as in this current study, is being determined a low alpha reflects high content validity (Mike Phillips, Statistician, personal communication, 13th September 2004). The Cronbach's alpha reliability of .65 for the ATBF scale met the criteria for moderate internal consistency in exploratory research (Robinson, Shaver, & Wrightsman, 1991).

4.5 ADOLESCENT STUDENTS' KNOWLEDGE AND ATTITUDES TOWARD BREASTFEEDING

The following sections address the overall aim of the study: to determine adolescent male and female secondary school students' knowledge and attitudes toward breastfeeding. Specifically, the findings presented relate to the following research objectives.

- Determine year-nine and year-12 secondary school students' knowledge and attitudes toward breastfeeding.
- Compare breastfeeding knowledge and attitude between male and female year-nine, and male and female year-12 secondary school students.
- Compare breastfeeding knowledge and attitudes between male year-nine students and male year-12 students, and female year-nine students and female year-12 secondary school students.
- Compare the breastfeeding knowledge and attitudes of rural and metropolitan secondary school students.

4.5.1 Overall breastfeeding knowledge

The 20-item BFK scale (Cusson, 1985) consisted of multiple-choice questions relating to breastfeeding and lactation. The SPSS (version 10.7) facilitated the data analysis and calculated knowledge scores by giving a value of one to each respondent's correct answer. The scores for the BFK scale ranged from 0 to 17 out of 20 possible correct answers. The mean breastfeeding knowledge score for all adolescent secondary school students in the study was 9.51 ($SD = 3.08$).

The five questions that were answered correctly by the majority (over 60%) of the respondents focused on colostrum and colostrum's important benefit, the proper diet for the breastfeeding mother and whether breast milk can be produced by all women. On the other hand, questions that resulted in a correct response for less than 25% of respondents were the 'let down' reflex, weaning and breast milk supply (Appendix 9). Of those who answered the

knowledge questions correctly most were females (90%) or year-12 students (75%). Table 4.5 shows 62.7% of students answered 10 or less questions correctly.

Table 4.5 Correct breastfeeding knowledge scores

Knowledge answers	n	%
5 or less correct	179	9.7
6 to 10 correct	976	53.0
11 to 15 correct	655	35.4
16 to 20 correct	35	1.9
Total	1845	100

4.5.2 Year-nine and year-12 respondents' breastfeeding knowledge

Mean knowledge score for the year-nine respondents' was 8.77 ($SD = 2.79$). The year-12 respondents' mean knowledge score was 9.65 ($SD = 3.13$).

The following t -test results are selected on the basis of the Levene test. One of the assumptions of the independent group t -test is that the groups should have equal variance; meaning that when the Levene test for Equality of Variance has a p value greater than .05, the population variances can be assumed to be relatively equal and the pooled-variance t -test is reported. If Levene's test is significant ($p < .05$) equality of variances cannot be assumed and t -test results for separate variances is reported.

4.5.3 Gender comparison of breastfeeding knowledge for year-nine and year-12 respondents

The overall mean breastfeeding knowledge scores for male respondents was 8.89 ($SD = 2.99$) compared with female respondents' mean breastfeeding knowledge score of 10.09 ($SD = 3.05$). Female respondents had significantly higher breastfeeding knowledge than male respondents (t (pooled-variance) = -8.56, $df = 1843$, $p < .001$). See table 4.6.

Similarly, year-nine and year-12 females had significantly higher knowledge scores than their male peers. See table 4.7. In addition, gender specific comparisons between years indicated that the mean breastfeeding knowledge for year-12 males and year-12 females was significantly higher than their year-nine equivalent. See table 4.8.

Table 4.6 Mean breastfeeding knowledge scores *t*-tests by gender

Gender	n	Mean (SD)	<i>t</i>	<i>df</i>
Male	900	8.89 (2.99)	-8.56	1843**
Female	945	10.09 (3.05)		

***p* < .01. Levene's test for Equality of Variances > .05.

Table 4.7 Mean breastfeeding knowledge scores *t*-tests by year for male and female respondents

Year	Males		Females		<i>t</i>	<i>df</i>
	n	Mean (SD)	n	Mean (SD)		
Year-9	539	8.37 (2.79)	544	9.17 (2.73)	-4.71	1081**
Year-12	361	9.65 (3.12)	401	11.35 (3.01)	-7.64	760**

***p* < .01. Levene's test for Equality of Variances < .05 year-9; > .05 year-12.

Table 4.8 Mean breastfeeding knowledge scores *t*-tests by gender for year-nine and year-12 respondents

Gender	Year-9		Year-12		<i>t</i>	<i>df</i>
	n	Mean (SD)	n	Mean (SD)		
Male	539	8.37 (2.79)	361	9.65 (3.13)	-6.27	711.33**
Female	544	9.17 (2.74)	401	11.35 (3.01)	-11.47	813.79**

***p* < .01. Levene's test for Equality of Variances < .05.

4.5.4 Demographic influence on adolescent breastfeeding knowledge

Kruskal-Wallis test was used to examine the possible differences in the respondents' breastfeeding knowledge scores due to demographic variables. Statistically significant differences were found for ethnic background

($\chi^2 = 31.48$, $df = 5$, $p < .001$), father's ($\chi^2 = 49.66$, $df = 11$, $p < .001$) and mother's ($\chi^2 = 50.07$, $df = 11$, $p < .001$) occupation classifications, and father's ($\chi^2 = 41.54$, $df = 5$, $p < .001$) and mother's ($\chi^2 = 9.12$, $df = 5$, $p < .001$) educational status. For this sample, demographic variables had a significant impact on breastfeeding knowledge.

The mean ranking of respondents' ethnic background in relation to breastfeeding knowledge scores revealed that the higher scores occurred in respondents from an Asian background ($n = 231$, 996.73). Respondents from a Middle Eastern background ($n = 25$, 978.40) were second in the mean ranking order.

The mean ranking of respondents' father's occupational classification in relation to breastfeeding knowledge scores revealed that the higher scores occurred when respondents' fathers indicated they were 'students' ($n = 6$, 1392.50), 'professionals' ($n = 263$, 1009.83), or 'managers and administrators' ($n = 323$, 994.26) respectively. When considering the top three rankings for the respondents' mother's occupational classification the top ranking also given as 'student' ($n = 12$, 1227.25). However, the second and third mean ranking consisted of 'associate professionals' ($n = 138$, 1102.15), and 'advanced clerical and service workers' ($n = 96$, 1009.90) respectively for the respondent's mother's occupational classification.

Mean ranking of the students' breastfeeding knowledge scores in relation to respondents' parent's educational levels revealed that both the respondents' fathers ($n = 108$, 1059.63) and mothers ($n = 101$, 1071.81) top mean rank was in the postgraduate qualification category. However, the second being 'university degree' ($n = 425$, 897.23) and third as 'apprenticeship/trade' ($n = 406$, 895.54) mean rankings of father's educational status were the reverse in the mother's educational status mean rankings. Second in the mother's educational status mean rankings was 'apprenticeship/trade' ($n = 113$, 1017.47) with the third being 'university degree' ($n = 455$, 973.46).

In summary, when considering the respondents' breastfeeding knowledge mean ranking in accordance with demographic factors, the higher knowledge rankings were revealed in those respondents from Asian and Middle Eastern backgrounds; with fathers and or mothers who had postgraduate qualifications; and parents who were students themselves.

4.5.5 Overall attitudes toward breastfeeding

The 18-item Attitude Toward Breastfeeding (ATBF) five-point Likert scale consisted of a set of favourable and unfavourable statement responses about breastfeeding. The five possible responses ranged from 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree to 5 = strongly disagree, with a possible score from 18 to 90.

Of the 1845 respondents, 97.5% ($n = 1799$) completed the ATBF section of the questionnaire with the remaining 2.5% ($n = 46$) of the students not answering this section. The 1799 respondents had a mean attitude score of 2.97.

Attitude score percentages (Appendix 10) were analysed and revealed that central tendency choice was obvious in the responses to nine of the 18 questions related to lifestyle, image of breastfeeding and breast versus bottle statements. Of the remaining nine questions with high response percentages, five responses showed positive attitudes toward breastfeeding and the other four responses were less positive in attitude.

4.5.6 Year-nine and year-12 respondents' attitudes toward breastfeeding

Mean attitude toward breastfeeding score for the year-nine respondents' was 2.95 ($SD = .42$). The year-12 respondents' mean attitude toward breastfeeding score was 2.99 ($SD = .36$).

Mann-Whitney U test to compare year-nine and year-12 respondents' attitudes toward breastfeeding revealed a statistically significant difference ($z = -2.997$, $p = .003$) with year-12 respondents having the higher mean attitude score than year-nine respondents (Table 4.9). This indicated that year-12 respondents were more positive towards breastfeeding than year-nine respondents.

Table 4.9 Summary of significant differences for each comparison group by attitudes toward breastfeeding scores

Group	n	Mean (SD)	Z score
Year: Year-9 / Year-12	1799	2.97 (.40)	-2.99**
Overall Male / Overall Female	1799	2.97 (.40)	-7.20**
Year 9: Male / Female	1083	2.95 (.42)	-5.40**
Year 12: Male / Female	762	2.99 (.36)	-4.72**
Male: Year- 9 / Year-12	879	2.92 (.43)	-2.07*
Female: Year-9 / Year-12	920	3.02 (.35)	-2.06*

* $p < .05$ ** $p < .01$ Mann-Whitney U test (2-tailed).

4.5.7 Gender comparison in attitudes toward breastfeeding for year-nine and year-12 respondents

The Mann-Whitney U independent samples test revealed that overall female respondents ($M = 3.02$, $SD = .35$) had statistically significant ($z = -7.20$, $p > .001$) higher mean attitudes towards breastfeeding scores when compared to male respondents ($M = 2.92$, $SD = .43$) (Table 4.9). Female respondents were found to be more positive in their attitudes toward breastfeeding than male respondents.

A statistically significant difference ($z = -5.40$, $p < .001$) was reported for gender comparison, with year-nine female respondents ($M = 3.01$, $SD = .36$)

indicating more positive attitudes toward breastfeeding than year-nine male respondents ($M = 2.90$, $SD = .47$). A statistically significant difference ($z = -4.72$, $p < .001$) was also found for gender comparison in the respondents' attitudes toward breastfeeding with year-12 female respondents ($M = 3.05$, $SD = .34$) indicating more positive attitudes than year-12 male respondents ($M = 2.93$, $SD = .37$).

A statistically significant difference ($z = -2.07$, $p < .03$) was reported for gender comparison, with year-12 male respondents ($M = 2.93$, $SD = .37$) indicating more positive attitudes toward breastfeeding than year-nine male respondents ($M = 2.90$, $SD = .47$). A statistically significant difference ($z = -2.06$, $p < .03$) was also found for gender comparison in the respondents' attitudes toward breastfeeding with year-12 female respondents ($M = 3.05$, $SD = .34$) indicating more positive attitudes than year-nine female respondents ($M = 3.01$, $SD = .36$).

In summary, the overall gender group comparisons for the current study indicated a significant difference in attitudes to breastfeeding between male and female gender groups with females being more positive in their attitudes toward breastfeeding. Similar findings were revealed between gender groups in the same year, with years nine and 12 female respondents being more positive toward breastfeeding than male respondents in the same year.

4.5.8 Demographic influence on adolescent attitudes to breastfeeding

Kruskal-Wallis test was used to determine if ethnic background, respondents' parents' occupation or level of education influenced the adolescents' attitudes to breastfeeding. When comparing the ethnic background groups previously identified with the mean ranking of attitude scores no statistical difference was noted ($\chi^2 = 10.18$, $df = 5$, $p = .07$). Comparison of the respondent's father ($\chi^2 = 13.85$, $df = 11$, $p = .24$) and mother ($\chi^2 = 14.70$, $df = 11$, $p = .19$) occupational classifications with the mean ranking revealed no statistical difference for either parent group. Similar findings were revealed

for both respondents' father ($\chi^2 = 9.12$, $df = 5$, $p = .10$) and mother ($\chi^2 = 7.97$, $df = 5$, $p = .15$) educational levels' comparisons with the mean rankings where no statistical difference was noted. Overall there were no statistical differences noted for any of the demographic factors in relation to adolescent attitudes toward breastfeeding.

4.6 COMPARISON OF RURAL AND METROPOLITAN STUDENTS' BREASTFEEDING KNOWLEDGE AND ATTITUDES

The comparison of *site* and the correct *knowledge* responses revealed that the metropolitan respondents answered more questions correctly (40% of the questions) than the rural respondents (20% of the questions) (Appendix 9).

4.6.1 Comparison of mean breastfeeding scores for rural and metropolitan respondents

When comparing the overall mean knowledge scores of rural and metropolitan school sites, the *t*-test results showed that the metropolitan respondents ($M = 9.74$, $SD = 2.97$) had statistically significant higher breastfeeding knowledge scores (t (separate-variance) = -5.21, $df = 818.02$, $p < .001$) than the rural respondents ($M = 8.87$, $SD = 3.29$) (Table 4.10). This indicated that the metropolitan secondary school students surveyed had higher breastfeeding knowledge than the rural secondary school students.

Table 4.10 Mean breastfeeding knowledge scores *t*-tests by site

SITE	n	Mean	(SD)	<i>t</i>	<i>df</i>
Metropolitan	1345	9.74	(2.97)	-5.21	818.02**
Rural	500	8.87	(3.29)		

** $p < .01$ Levene's test for Equality of Variances $< .05$.

4.6.2 Comparison of mean attitude scores for rural and metropolitan respondents

The mean ranking order for attitudes toward breastfeeding scores revealed that there was a statistically significant difference ($z = -2.03$, $p = .04$) (Table 4.11). Metropolitan respondents had the higher mean attitude score ($M = 2.98$, $SD = .38$), hence were more positive towards breastfeeding than the rural respondents ($M = 2.95$, $SD = .44$).

Table 4.11 Summary of significant difference for site comparison by attitudes toward breastfeeding scores

Site	n	Mean (SD)	Z score
Rural / Metropolitan	1799	2.97 (.40)	-2.03*

* $p < .05$ Mann-Whitney U test (2-tailed).

In summary, with regard to the comparison of rural and metropolitan respondents, metropolitan respondents had higher breastfeeding knowledge and were more positive towards breastfeeding than the rural respondents.

4.7 POST HOC FINDINGS OF INTEREST

4.7.1 Multiple comparisons for breastfeeding knowledge

Univariate analysis of variance (ANOVA) was used to compare the means of between-group combinations of *gender*, *year*, and *site*. To avoid a Type 1 error a Tukey's HSD post hoc test was conducted to ascertain where the significance lies in the set of comparisons chosen. The between-group combinations of *gender*, *year*, and *site* had statistically significant differences between-groups for mean knowledge scores (Table 4.12).

Table 4.12 Univariate Analysis of Variance between-group comparisons for breastfeeding knowledge

	Sum of Squares	df	Mean Square	F
Between Groups	2388.90	7	341.27	41.34**
Within Groups	15164.30	1837	8.25	
Total	17553.20	1844		

** $p < .01$

When reviewing parameter estimates for the between-group comparison combinations, the female year-12 metropolitan respondents had a higher mean breastfeeding knowledge score than any other combination. Female year-12 rural respondents had a lower mean breastfeeding knowledge score than the female year-12 metropolitan respondents; however, this was not statistically significant. All other combinations had lower mean breastfeeding knowledge scores that were statistically significant (Table 4.13).

Table 4.13 Parameter estimates for between-group comparisons for mean breastfeeding knowledge score

Parameter	B	SE	t	95% Confidence Int	
				Lower Bound	Upper Bound
Intercept	11.45	.16	70.26**	11.13	11.77
Male Year-9 Rural	-3.73	.27	-13.92**	-4.26	-3.21
Male Year-9 Metro	-2.74	.22	-12.29**	-3.17	-2.30
Male Year-12 Rural	-1.29	.41	-3.17**	-2.09	-.49
Male Year-12 Metro	-1.89	.23	-8.14**	-2.35	-1.43
Female Year-9 Rural	-2.94	.27	-10.72**	-3.48	-2.40
Female Year-9 Metro	-1.98	.22	-8.99**	-2.41	-1.55
Female Year-12 Rural	-.41	.34	-1.20	-1.09	.26
Female Year-12 Metro	0 ^a

^a. This parameter is set to zero because it is redundant. * $p < .05$ ** $p < .01$
B = probability of Type 11 error, *SE* = Standard error of the mean.

4.7.2 Multiple comparisons for attitudes toward breastfeeding

Caution is needed in reviewing this section as attitudes toward breastfeeding scores are not normality distributed. Due to the well known robustness of

ANOVA the interpretation of the results in this section are acceptable (Mike Phillips, personal communication, 22nd February, 2005).

The ANOVA for between-group combinations of *gender*, *year*, and *year* and *site* comparisons all had statistically significant differences between groups for mean attitudes toward breastfeeding scores (Table 4.14).

Table 4.14 Univariate Analysis of Variance between-group comparisons for attitudes toward breastfeeding

	Sum of Squares	df	Mean Square	F
Between Groups	7.48	7	1.07	6.78**
Within Groups	282.31	1791	.16	
Total	289.79	1798		

** $p < .01$

The group of female year-12 metropolitan students demonstrated more positive breastfeeding attitudes than any other combinations of students. Statistically significant less positive attitudes toward breastfeeding were reported in the male year-9 rural, male year-9 metropolitan and male year-12 metropolitan student groups (Table 4.15).

Table 4.15 Parameter estimates for between-group comparisons for mean attitudes toward breastfeeding score

Parameter	B	SE	t	95% Confidence Int	
				Lower Bound	Upper Bound
Intercept	3.05	.02	134.93**	3.00	3.09
Male Year-9 Rural	-.17	.04	-4.62**	-.23	-.10
Male Year-9 Metro	-.12	.03	-3.93**	-.18	-.06
Male Year-12 Rural	-.06	.06	-1.05	-.17	.05
Male Year-12 Metro	-.12	.03	-3.75**	-.18	-.06
Female Year-9 Rural	-.09	.04	-2.53*	-.17	-.02
Female Year-9 Metro	-.01	.03	-.29	-.07	-.05
Female Year-12 Rural	.03	.05	.68	-.06	.13
Female Year-12 Metro	0 ^a

^a. This parameter is set to zero because it is redundant. * $p < .05$ ** $p < .01$
 B = probability of Type 11 error, SE = Standard error of the mean.

Overall, when comparing the combination of *gender*, *year* and *site* for both higher breastfeeding knowledge and positive attitudes to breastfeeding female year-12 metropolitan respondents had higher scores than all other combinations. Although female year-12 rural respondents had lower scores than the female year-12 metropolitan respondents these were not statistically significant. In conclusion, both rural and metropolitan female year-12 students had higher breastfeeding knowledge scores and were more positive to breastfeeding than rural and metropolitan year-nine and year-12 males and rural and metropolitan year-nine female students.

4.7.3 Relationship between respondents' breastfeeding knowledge and attitudes toward breastfeeding

A nonparametric Spearman's rho correlation coefficient was used to examine the relationship between respondents' knowledge and attitudes to breastfeeding. Computing the correlation index (r) between the overall knowledge and attitude scores revealed a weak but statistically significant positive correlation ($r = .14$, $p < .001$) suggesting that the greater the breastfeeding score the more positive the respondents' attitudes towards breastfeeding (Table 4.16).

Table 4.16 Correlation of overall knowledge score to overall attitude score

Spearman's rho		Knowledge Score	Attitude Score
Knowledge Score	Correlation Coefficient	1	.138**
	Sig. (2-tailed)	.	.000
	N	1845	1799
Attitude Score	Correlation Coefficient	.138**	1
	Sig. (2-tailed)	.000	.
	N	1799	1799

** $p < .01$. Correlation is significant at the .01 level (2-tailed)

A Mann-Whitney U test was utilised for comparisons of the possible relationship between the respondents' breastfeeding knowledge and attitudes scores in relation to whether they themselves or their siblings were breastfed,

and other external influences such as television or classroom exposure to breastfeeding.

Comparison of adolescent students who were breastfed with respondents' knowledge scores was statistically significant ($z = -3.47, p > .001$). Similar findings were revealed where siblings were breastfed ($z = -5.07, p > .001$), had seen someone breastfeed ($z = -4.38, p > .001$), had seen movies on breastfeeding ($z = -5.16, p > .001$) or had read about breastfeeding ($z = -4.40, p > .001$) (Table 4.17). Hence, students exposed to breastfeeding either by being breastfed themselves or having siblings who were breastfed or by reading or seeing breastfeeding had higher breastfeeding knowledge scores.

Table 4.17 Summary of significant differences for each general question response by breastfeeding knowledge scores (N = 1845)

Question/response (Yes/No)	Z score
Respondents were breastfeed	-3.47*
Siblings were breastfeed	-5.07**
Seen someone breastfeeding	-4.38**
Seen movies on breastfeeding	-1.85
Seen breastfeeding on TV	-1.31
Read about breastfeeding	-2.46*
Breastfeeding mentioned in class	-1.50

* $p < .05$ ** $p < .01$ Mann-Whitney U test (2-tailed).

Comparison of adolescent students who were breastfed and their attitudes toward breastfeeding, indicated respondents who were breastfed ($z = -2.32, p = .02$) had higher attitude scores. Similar results were revealed for respondents who had seen someone breastfeeding ($z = -2.09, p = .03$), who had seen movies on breastfeeding ($z = -5.16, p < .001$) and had read about

breastfeeding ($z = -2.46$, $p = .01$). However, no statistically significant difference ($p = .103$) was noted when comparing the respondents' attitude scores to whether the respondents' siblings being breastfed influenced their attitudes toward breastfeeding, whether the respondents had seen breastfeeding on television ($p = .19$) and whether breastfeeding has been mentioned in class ($p = .10$) (Table 4.18). Hence, students who were breastfed, or had seen movies on or read about breastfeeding had more positive attitudes towards breastfeeding than the other students who had not.

Table 4.18 Summary of significant differences for each general question response by attitudes toward breastfeeding scores (N = 1799)

Question/response (Yes/No)	Z score
Respondents were breastfeed	-2.32*
Siblings were breastfeed	-1.62
Seen someone breastfeeding	-2.09*
Seen breastfeeding on TV	-1.30
Seen movies on breastfeeding	-5.16**
Read about breastfeeding	-2.46*
Breastfeeding mentioned in class	-1.64

* $p < .05$ ** $p < .01$ Mann-Whitney U test (2-tailed).

In summary, respondents who were breastfed themselves, had seen someone breastfeeding or read about breastfeeding had higher breastfeeding knowledge scores and were more positive towards breastfeeding than those who had not. Respondents with siblings who were breastfed had higher breastfeeding knowledge; however, there was no indication that their attitudes to breastfeeding were more positive. Breastfeeding being mentioned in class made no difference to either breastfeeding knowledge or attitudes towards breastfeeding in the adolescent respondents.

4.7.4 Possible influences relating to adolescent respondents' attitudes toward breastfeeding

Frequencies and percentages of respondents' who identified factors influencing their attitudes toward breastfeeding are listed in Appendix 11. Recoding was necessary to manage the large variability in responses to questions in section four of the questionnaire. They were re-categorised into five groups. Four of the five categories were sources of efficacy information based on Bandura's self-efficacy theory. Efficacy information categories consisted of persuasion / education, vicarious experience / role modelling, emotional / physiological response to the idea of breastfeeding and actual experience.

4.7.4.1 Actual experience

One respondent answered the question related to actual experience. The respondent indicated personal experience of having breastfed her own baby as an influencing factor towards her attitude to breastfeeding.

4.7.4.2 Persuasion / education information source

This category included those respondents who reported influences with words such as: natural, healthy for mother and or baby, provides antibodies, encourages bonding, breastfeeding is convenient, more hygienic, and safe. Respondents who indicated persuasion/education influences referred to breastfeeding as being healthy for baby ($n = 230$, 12.5%), breastfeeding is the natural way ($n = 123$, 6.6%), what is reported in the media and seen in the community ($n = 50$, 2.7%), provides antibodies ($n = 26$, 1.4%), aids in bonding ($n = 25$, 1.4%), human biology and early childhood classes ($n = 10$, .5%), easy and convenient ($n = 10$, .5%), protects the health of the mother ($n = 8$, .4%), knowledge of breastfeeding and breastfeeding advantages over artificial feeding ($n = 3$, .2%) or more hygienic and safer ($n = 2$, .1%).

4.7.4.3 Vicarious experience / role modelling

This category included those respondents who identified factors influencing their attitudes centred on mother and family influence, exposure to breastfeeding role models, being breastfed or not breastfed. Respondents reported factors that influenced their attitudes toward breastfeeding as being their mothers ($n = 55$, 3%), family exposure and breastfeeding role models ($n = 51$, 2.8%), being breastfed ($n = 9$, .5%) or not being breastfed ($n = 3$, .2%).

4.7.4.4 Emotional / physiological information source

Emotional / physiological information source section included mixed responses on influences. The more negative responses centred on breastfeeding causing embarrassment or natural but embarrassing ($n = 47$, 2.5%), being gross ($n = 7$, .4%), inconvenient and time consuming ($n = 6$, .3%), or aware of some mothers having trouble with breastfeeding ($n = 2$, .1%) and one response relating to breast milk allergies ($n = 1$, .1%). The more positive responses were those who saw breastfeeding as beautiful and great ($n = 5$, .3%) or cool with nothing wrong with breastfeeding ($n = 1$, .1%).

4.7.4.5 Missing data related to significant factors

The missing data included respondents who did not answer the question, non-relevant responses, those who answered no to the question and those who indicated that they did not know anything about breastfeeding. Also included were the respondents who indicated they were able to identify significant factors that influenced their attitudes to breastfeeding but did not state what these factors were. Approximately one third ($n = 588$, 31.9%) of students indicated that they did not identify any significant factors influencing their attitudes toward breastfeeding. Nearly a third of the students did not answer the question ($n = 496$, 26.8%) or gave responses that were not relevant ($n = 59$, 3.2%), such as "who cares" or "stupid question" or responded that they did not know anything about breastfeeding ($n = 14$, .7%).

A small number of students ($n = 13$, .7%) answered 'yes' to identifying factors but did not mention the factors. Hence, the majority ($n = 1170$, 63.3%) of students did not provide responses that allowed for identifying any factors that would influence their attitudes toward breastfeeding. The remaining 36.7% ($n = 675$) of students in this study indicated factors relevant to influencing their attitudes toward breastfeeding.

In the section to follow, these factors have been grouped according to the four source of efficacy information that influences behavioural choices (Tables 2.19-4.21).

4.7.5 Sources of efficacy information and adolescents' attitudes to breastfeeding

Kruskal-Wallis test was used to examine the possible differences in the categorical variables of *gender* (male, female), *school year* (nine, 12) and *site* (rural, metropolitan) in relation to the four efficacy information sources. Statistical significant differences were noted between male and female ($\chi^2 = 77.62$, $df = 4$, $p < .001$), years nine and 12 students ($\chi^2 = 83.35$, $df = 4$, $p < .001$), and rural and metropolitan respondents ($\chi^2 = 28.38$, $df = 4$, $p < .001$) when relating to the sources of efficacy information influence on the respondents' attitudes toward breastfeeding (See Tables 4.19 to 4.21 respectively).

Table 4.19 indicates that 73.1% of male students and 54.2% of female students did not respond to the question on identifying factors that influence their attitudes toward breastfeeding.

Table 4.19 Sources of efficacy information influencing male and female respondents' attitudes toward breastfeeding

Student responses to Q56	Male		Female	
	n	%	n	%
Persuasion / education	188	20.9	299	31.6
Vicarious experience / role modelling	37	4.1	81	8.6
Emotional / physiological	17	1.9	52	5.5
Actual experience	0	0	1	.1
Missing data	658	73.1	512	54.2
Total	900	100	945	100

$(\chi^2 = 77.62, df = 4, p < .001)$

For the participants who chose to answer these questions, the three sets of comparison data (Tables 4.19-4.21) indicated that responses attributed to persuasion/education as an efficacy information source was highest. All sources of efficacy information were more prominent in female respondents than male respondents. By contrast, higher percentage of year-nine, rural and male respondents did not identify sources of efficacy information.

Table 4.20 Sources of efficacy information influencing year-nine and year 12 respondents' attitudes toward breastfeeding

Student responses to Q56	Year 9		Year 12	
	n	%	n	%
Persuasion / education	235	21.7	252	33.1
Vicarious experience / role modelling	37	3.4	81	10.6
Emotional / physiological	43	4.0	26	3.4
Actual experience	0	0	1	.1
No factors identified	768	70.9	402	52.8
Total	1083	100	762	100

$(\chi^2 = 83.35, df = 4, p < .001)$

Table 4.21 Sources of efficacy information influencing rural and metropolitan respondents' attitudes toward breastfeeding

Student responses to Q56	Rural		Metropolitan	
	n	%	n	%
Persuasion / education	97	19.4	390	29.0
Vicarious experience / role modelling	34	6.8	84	6.2
Emotional / physiological	10	2.0	59	4.4
Actual experience	1	.2	0	0
Missing data	358	71.6	812	60.4
Total	500	100	1345	100

($\chi^2 = 28.38$, $df = 4$, $p < .001$)

In summary students reporting positive influences on attitudes to breastfeeding were mainly metropolitan, female students in year-12. Factors such as health of mother and baby, family and mother influence, being breastfed were cited.

4.7.6 Breastfeeding future children

Small numbers of participants in the study, both male (16.8%, $n = 147$) and female (11.7%, $n = 108$), did not answer the question related to the consideration of breastfeeding future children.

Tables 4.22 – 4.24 indicate that statistically significant differences were noted between male and female ($\chi^2 = 67.30$, $df = 4$, $p < .001$), years nine and 12 students ($\chi^2 = 53.39$, $df = 4$, $p < .001$), and rural and metropolitan respondents ($\chi^2 = 68.86$, $df = 4$, $p < .001$), respectively when considering breastfeeding future children.

Of those students that responded, over 60% of both males (64.8%, $n = 558$) and females (61.3%, $n = 565$) reported that they would consider breastfeeding future children. Of the students who reported that they had not really thought about breastfeeding future children, 11.1% ($n = 102$) were

female and 2.4% ($n = 21$) were male (Table 4.22). Four percent ($n = 36$) of the male respondents reported that they would let their partners choose the infant feeding method.

Table 4.22 Consideration to breastfeeding future children by gender

Response	Male		Female	
	n	%	n	%
Yes	558	64.8	565	61.3
No	57	6.6	89	9.7
Not really thought about it	21	2.4	102	11.1
May be / not sure	80	9.3	58	6.3
Not answered	147	16.8	108	11.7
Total responses	861	100	922	100

($\chi^2 = 67.30$, $df = 4$, $p < .001$)

Seventy-two percent (72.8%) of year-12 respondents had considered breastfeeding future children compared to 56.2% of year-nine respondents. More year-nine respondents had not really thought about breastfeeding future children, were not sure or chose not to answer the question than year-12 respondents (Table 4.23).

Table 4.23 Consideration to breastfeeding future children by year

Response	Year 9		Year 12	
	n	%	n	%
Yes	595	56.2	528	72.8
No	97	9.2	49	6.8
Not really thought about it	85	8.0	38	5.2
May be / not sure	94	8.9	44	6.1
Not answered	187	17.7	66	9.1
Total responses	1085	100	725	100

($\chi^2 = 53.39$, $df = 4$, $p < .001$)

The metropolitan respondents were more inclined to consider breastfeeding future children than the rural respondents (Table 4.24).

Table 4.24 Consideration to breastfeeding future children by site

Response	Rural		Metropolitan	
	n	%	n	%
Yes	250	51.3	873	67.4
No	48	9.9	98	7.6
Not really thought about it	35	7.2	88	6.8
May be / not sure	34	7.0	104	8.0
Not answered	120	24.6	133	10.3
Total responses	487	100	1296	100

($\chi^2 = 68.86, df = 4, p < .001$)

In summary, similar percentages of males and females considered breastfeeding future children. Consideration to the breastfeeding of future children was more prominent in year-12 metropolitan students.

4.7.7 Students who have become parents

Five male respondents who were fathers all reported that their children were breastfed. Of the 12 female respondents who were mothers, 11 reported that their children were breastfed.

4.8 SUMMARY

Demographic data revealed that the majority of the student respondents were white Caucasians from State Government schools in the metropolitan area of Perth. Just over half the respondents were in the 13 to 14 year age group in school year-nine, with a relatively even spread of males and females in all groups. A high percentage of students were unsure of their parents' educational status. Fathers' educational status was predominantly university

degrees, trade certificates or high school. Mothers' education was predominantly high school with university degree the next highest category. Parental occupation varied with fathers predominantly tradespersons, followed by managers and administrators. A high percentage of students did not state their mother's occupation but for those students who did respond their mothers were mainly in the professional, clerical, sales and service areas.

Demographic factors that may have an influence on the students' breastfeeding knowledge were revealed. Higher knowledge was reported from students with Asian and Middle Eastern backgrounds; with fathers and/or mothers who have postgraduate qualifications; and parents who are students themselves. However, in this study demographic factors were independent of the secondary school students' attitudes toward breastfeeding.

With regard to adolescent secondary school students' knowledge, the mean breastfeeding knowledge score in the study was 9.51 out of a possible 20. Overall, female students had higher breastfeeding knowledge scores than male students. In both year groups, the female students had higher breastfeeding knowledge scores than the male students.

Of the students who responded to the attitude questions, central tendency choice was reported for half of the overall students' responses. Of the remaining responses, slightly more student responses were positive than less positive in attitudes toward breastfeeding. Overall female students were more positive in their attitude towards breastfeeding than male students. Again, female students in both year groups were more positive towards breastfeeding than male students.

Same gender comparisons between year-nine and year-12 students found that both male and female students in year-12 had higher breastfeeding scores than the male and female students in year-nine. Similarly, both male

and female year-12 students were more positive in their attitudes toward breastfeeding than male and female year-nine students.

The comparison of rural and metropolitan students indicated that overall metropolitan students had higher breastfeeding knowledge scores than the rural students. Similarly, metropolitan students were more positive toward breastfeeding than the rural students.

When comparing the combination of gender, year and site for higher breastfeeding knowledge and positive attitudes to breastfeeding both rural and metropolitan female year-12 students had higher breastfeeding knowledge and were more positive to breastfeeding. Factors that influenced positive influences were cited as being the health of mother and baby, family and mother influence, being breastfed. The negative factors that influence breastfeeding, such as embarrassment, were reported by a small number of students.

Persuasion/education as a source of efficacy information was more prominent in female secondary school students than male secondary school students when considering attitudes toward breastfeeding. However, the majority of both male and female students did not respond to the question to identify factors that influence their attitudes toward breastfeeding.

Consideration of breastfeeding future children was similar for both male and female students. Nevertheless, this was more prominent in year-12 metropolitan students. Of the 12 students who have become parents 11 reported that their children had been breastfed.

The results have been presented in detail in this chapter and will be discussed in terms of known research literature in the following chapter. In addition, the implications of these results to health promotion and education will be discussed.

CHAPTER FIVE

DISCUSSION

The overall aim of this study was to determine adolescent secondary school students' knowledge and attitudes toward breastfeeding in metropolitan and rural settings. To achieve this, a self-report questionnaire was completed by consenting adolescent students which allowed for this quantitative study involving a descriptive cross-sectional design.

This chapter discusses the study findings in relation to existing literature. The principle findings and the implications of the study are discussed in relation to self-efficacy theory. In addition, the strengths and limitations of the study are reviewed. Finally recommendations from the study are provided.

5.1 BACKGROUND TO THE FINDINGS

The secondary school student sample in the current study (N = 1845) provides baseline data concerning Australian adolescent knowledge and attitudes toward breastfeeding. The majority of the respondents (93%) come from State government schools with approximately two thirds of the students attending schools in the Perth metropolitan area of Western Australia.

In relation to Australian adolescent breastfeeding knowledge and attitudes, the current study provides a broad understanding of knowledge and attitudes as it has a large sample (N = 1845) compared to previous studies. Earlier Australian studies used quantitative methods with small sample sizes of 94 (Wolinski, 1989) through to 305 (Ellis, 1984). Some studies were limited in that they surveyed adolescent female students only (Cusson, 1985; Friel et al., 1989; Kim, 1998; Leffler, 2000; Pascoe & Berger, 1985; Yeo et al., 1994). The current study included male students because of their potential to impact decision-making and their role as future fathers. It is known fathers play an important role in supporting maternal breastfeeding decisions and influencing

the duration of breastfeeding (Bar-Yam & Darby, 1997; Earle, 2000; Hauck et al., 2002; Scott et al., 1997; Sharma & Petosa, 1997).

5.2 STUDY FINDINGS

The current study explored four main objectives. These objectives were to:

- determine year-nine and year-12 secondary school students' knowledge and attitudes toward breastfeeding,
- compare breastfeeding knowledge and attitude between male and female year-nine, and male and female year-12 secondary school students,
- compare breastfeeding knowledge and attitudes between male year-nine students and male year-12 students, and female year-nine students and female year-12 secondary school students, and
- compare breastfeeding knowledge and attitudes of rural and metropolitan secondary school students.

5.2.1 Overall breastfeeding knowledge

The current study reveals that over 60% of respondents answered 10 or less questions correctly out of the possible 20. The majority of the students (53%) answered 6 to 10 questions correctly which suggests that they had less than ideal breastfeeding knowledge. The male and female respondents had slightly higher knowledge scores than the male and female students in Wolinski's (1989) Australian study that found 75% of students had low or medium breastfeeding scores.

When comparing females only, the year-12 female respondents in the current study had similar mean knowledge scores to the students in Friel et al. (1989) study, however, lower mean knowledge scores than the female students in Cusson's (1985) study. Cusson's knowledge questionnaire, used in this and previous work (Friel et al.), allows for consistency in the comparison of female students' mean knowledge scores in the three studies. Cusson (email, 2nd April 2003) stated that she was not surprised with the

lower knowledge score reported in the current study. As, in her study, several girls in the higher grade had taken a child development course where breastfeeding was discussed Cusson suggests this may have accounted for the higher knowledge score obtained in her study.

Specifically, knowledge about physiology and the benefits of breastfeeding was less than adequate in the findings of the current study. For example, questions that were answered poorly were breast milk supply, the benefits of breastfeeding on the mother's body, when a mother must stop nursing and let down reflex. This lack of knowledge is supported by previous authors (Dewan et al., 2002; Lauwers & Shinskie, 2000; Wambach & Cole, 2000). Breast milk insufficiency based on frequent infant crying and infant feeding pattern changes is often the impetus for cessation of breastfeeding when in fact this is only a temporary change in feeding behaviour (Scott et al., 1997). Doubt about insufficient breast milk is the most commonly cited reason for early cessation of breastfeeding (Scott & Binns, 1999). Hence, the importance of education that addresses lactation and breastfeeding physiology to assist in the reduction of ignorance in this area. The current study had a high percentage of correct answers related to appropriate diet for breastfeeding mothers, and whether all women can produce breast milk. This latter finding is consistent with Scott et al. (1997).

Conflicting responses were evident in the current study. For example, respondents disagreed that '*breastfeeding provides a closer link with the mother*' and '*breastfeeding provides the amount of milk the baby needs*' (66.2% of students). However, '*breastfeeding provides insufficient milk*' also evoked a disagreement response among 60% of the respondents. A possible explanation for this could be related to the lack of respondents' breastfeeding knowledge of lactation physiology. Recent studies (Greene et al., 2003; Kessler et al., 1995) emphasise the importance of breastfeeding role models to increase breastfeeding awareness and thus reduce misconceptions.

5.2.2 Year-nine and year-12 respondents' breastfeeding knowledge

The current study indicates that respondents in the higher grades have higher breastfeeding knowledge when compared to the respondents in the lower grades. The reason for the higher knowledge scores amongst the older students in this current study is not immediately apparent. However, the results support Ellis' (1983) suggestion that general life experiences and greater exposure to breastfeeding may explain the higher knowledge scores.

5.2.3 Gender comparison of breastfeeding knowledge

Among males and females in year-nine and year-12, a statistically significant difference in knowledge scores was revealed. Female respondents had statistically significantly higher breastfeeding knowledge scores than the male respondents in the same year. This finding supports Wolinski's (1989) study with female students having higher breastfeeding knowledge. However, in contrast to the current study Wolinski's reported differences were not statistically significant.

The findings of the current study fit the sources of efficacy information as an explanation of sex-role development where adolescents' learn their roles through societal based imitation or observational learning (Slee, 2002). This sex-role development could be argued as a reason for the higher breastfeeding knowledge in the female respondents.

5.2.4 Overall attitudes toward breastfeeding

The findings of this and previous studies indicate that adolescents as a group hold a mixture of negative and positive attitudes that may influence their future infant feeding choices (Ellis, 1984; Lauwers & Shinskie, 2000; Scott et al., 1997). In contrast, other studies reveal that the majority of respondents hold positive attitudes toward breastfeeding (Cusson, 1985; Forrester et al., 1997; Gregg, 1989; Purtell, 1994).

The majority of the respondents in the current study disagreed with the idea that '*breastfeeding is healthier for the baby*, with approximately half of the respondents disagreeing with the statement '*breastfeeding is more convenient*'. This is consistent with Purtell (1994) and Wolinski (1989) where infant formula feeding was reported as more convenient. However, Forrester et al, 1997 indicated that the majority of the students in their study perceived breastfeeding to be healthier and to be more convenient than formula feeding. Possible explanations have been postulated for this difference. Greater exposure of adolescents in the current study to women who formula feed their infants, the fact that the respondents were formula fed themselves or they had siblings that were formula fed may explain the difference. Their exposure to, and observation of, infant formula feeding practice may have resulted in more negative attitudes toward breastfeeding and more support for formula feeding.

The findings of this study reveal that approximately 21-47% of students gave neutral responses to all but one of the attitude questions. This may indicate that respondents are undecided in their attitudes toward breastfeeding. The neutral responses centred on questions related to lifestyle, image of breastfeeding and breast versus formula feeding statements. One reason postulated for this difference may be reduced exposure to extended family and thus women with breastfed infants. If this is the case, verbal persuasion and observational learning opportunities, where adolescents can consider the advantages and disadvantages of breastfeeding from significant others, would be reduced. The value of providing breastfeeding observational learning is supported by Friel et al. (1989) where it was revealed that adolescent attitudes to breastfeeding can be favourably influenced by media promotion campaigns.

5.2.5 Year-nine and year-12 respondents' attitudes to breastfeeding

Both the current study and previous research (Cusson, 1985; Mackay, 1995) suggest that respondents in the higher grades are more positive in their attitudes toward breastfeeding when compared to the respondents in the

lower grades. However, Cusson reported that students in the higher grade had access to childcare classes, which may account for the more positive attitudes. As previously found with breastfeeding knowledge, the reasons for the more positive attitudes in the higher grades in this current study are not apparent. However, it is postulated that age and maturity may explain the more positive attitudes. The increase in age effects biological and psychosocial maturation, which increases self-esteem and acceptance of the adolescent's gender identity and body image (Slee, 2002).

5.2.6 Gender comparison in attitudes to breastfeeding

Female respondents in each year were more positive towards breastfeeding than male students, and male and female respondents in the same year were significantly different in attitudes. Although Wolinski reported differences between male and female students' attitudes towards breastfeeding, the difference was not statistically significant.

The findings of the current study suggest that adolescent's acceptance of gender identity could be argued as a reason for the more positive breastfeeding attitudes in female respondents. The more positive attitudes in female respondents may also be attributed to the differences in male and female identity formation occurs (Kaplan, 2000). Males traditionally focus on vocational and personal identity whereas females tend to concentrate more on interpersonal relationships (Erikson, 1968; Kaplan, 2000). It is suggested that the influence of verbal persuasion and vicarious experience through social modelling on interpersonal relationships may account for more positive breastfeeding attitudes in female respondents.

5.2.7 Demographic influence on adolescent breastfeeding knowledge and attitudes

Consistent with known literature, the current study reveals higher knowledge in those respondents from Asia and Middle Eastern backgrounds. In a literature review conducted by Scott and Binns (1999) it was noted that

studies in Western Australia in the 1980s indicated that breastfeeding rates of migrant mothers reflected the prevailing social norm. This may account for the higher breastfeeding knowledge in the Asian and Middle Eastern respondents in the current study.

Respondents in the current study with fathers or mothers holding postgraduate qualifications and parents who are students themselves were found to have higher breastfeeding knowledge. Again, in Scott and Binns's (1999) literature review it was revealed in studies using multivariate analysis that mothers with higher education levels were more likely to breastfeed for longer duration. In relation to fathers it may be that more highly educated fathers are better informed and have easier access to information regarding breastfeeding.

5.2.8 Comparison of rural and metropolitan respondents' breastfeeding knowledge and attitudes

The current study shows that metropolitan respondents had significantly higher breastfeeding knowledge scores than rural students. Both male and female metropolitan secondary school respondents had higher breastfeeding knowledge when compared to rural secondary school students.

There was, however, no difference between the rural and metropolitan respondents' responses to the statement that '*breastfeeding is healthier for baby*'. A similar percentage of both rural and metropolitan respondents disagreed with the statement. In contrast, Mackay (1995) reported that rural students were more likely to think that breastfeeding was healthier for the baby than metropolitan students. It could be argued that an increase in multimedia and access to the Internet for all students has provided the avenue for increased information in relation to breastfeeding. Whether this information is portrayed negatively or positively, it is plausible that it may have reduced the gap in breastfeeding knowledge between rural and metropolitan adolescent students.

Similarly, in relation to attitudes, metropolitan respondents were more positive toward breastfeeding than the rural respondents. However, both rural and metropolitan females had more positive attitudes to breastfeeding compared to male respondents at the same site as the female respondents.

Unfortunately, there is a dearth of literature comparing rural and metropolitan adolescent students' breastfeeding knowledge and attitudes toward breastfeeding. A United Kingdom study of rural children, both primary and secondary school age, found that they were more likely to have been breastfed, and more inclined to want their own babies to be breastfed than urban students (Mackay, 1995). Although the difference was not statistically significant, the current study found that more rural respondents (76.1%) indicated they were breastfed than metropolitan respondents (71.8%).

Again for the statement that focused on breastfeeding being embarrassing, both rural and metropolitan respondents had similar percentage rates of neutral responses. The disagree response for rural and metropolitan respondents was also the same for both groups. The issue of adolescent embarrassment toward breastfeeding influencing their attitudes to breastfeeding was reported in previous studies as being a common barrier to breastfeeding (Dewan et al., 2002; Forrester et al., 1997; Wolinski, 1989; Leffler, 2000). This was not immediately apparent in this study for either the rural or the metropolitan secondary school students. For the secondary school students who participated in this study, embarrassment toward breastfeeding as an influence was not deemed an issue of common concern.

In summary, the current study found positive attitudes exist for all the sources of efficacy information, the greatest influence being verbal encouragement from significant others such as mother and family. All sources of efficacy information were more prominent in the female respondents than the male respondents. Verbal persuasion, emotional and physiological influences were more evident in the metropolitan respondents. Encouragement from significant others and observation learning through role modelling influence were more evident in the year-12 respondents. However, a higher

percentage of year-nine, rural and male respondents did not answer the question relating to influences on attitudes towards breastfeeding.

5.2.9 Relationship between respondents' breastfeeding knowledge and attitudes

Consistent with the findings reported in the literature, in this current study there is a relationship between adolescent respondents' knowledge and attitudes toward breastfeeding. The current study indicates a weak positive correlation between breastfeeding knowledge and attitudes for respondents who were breastfed, who had seen someone breastfeeding and who had read about breastfeeding. Similarly, Cusson's (1985) earlier findings that the greater the students' breastfeeding knowledge the more positive were their attitudes toward breastfeeding is also supported. This weak positive correlation in the current study may be due to the minimal exposure current adolescent respondents have to breastfeeding women due to the reduction in extended family contact and reduced number of siblings in today's Australian family structure.

The current study reveals that respondents with siblings who were breastfed had higher breastfeeding knowledge than those who did not have siblings who were breastfed; however, there was no indication that their attitudes to breastfeeding were more positive. This is contrary to Cusson's findings where attitudes were found to be more positive if siblings had been breastfed.

Again, the current study reveals weak positive correlations between breastfeeding knowledge and attitude scores for those respondents who have seen a baby breastfed on television. Studies on the effects of breastfeeding promotional campaigns on adolescent females conclude that those females exposed to the breastfeeding promotional campaigns showed positive attitudes and norms toward breastfeeding (Friel et al., 1989; Kim, 1998). Similarly, Friel et al.'s (1989) suggestion that adolescents may develop a positive attitude when actively targeted by media is supported by

the current study; however, the exposure to breastfeeding information in the classroom is not. The current study reveals that breastfeeding being mentioned in class made no difference to either breastfeeding knowledge or attitudes towards breastfeeding in the adolescent respondents. To further support adolescent breastfeeding campaigns in changing behavioural choices self-efficacy theory suggests observational learning such as role modelling that can impact attitude formation (Bandura, 1997).

5.2.10 Possible influences relating to adolescent respondents' attitudes toward breastfeeding

The current study is consistent with the literature (Cusson, 1985; Forrester et al., 1997; Hannon et al., 2000; Wiemann et al., 1998) on the influences relating to adolescent breastfeeding attitudes. These influences include the benefits of breastfeeding, health of mother and infant, negative impact of misconceptions and, impact of others. For the adolescent secondary school respondents this includes their mother and family and breastfeeding information sources. In the current study, the sources of efficacy information that influence adolescent attitudes toward breastfeeding are more prominent in female secondary respondents than the male respondents. Again, this may be due to the differences in gender identity towards potential future role in relation to breastfeeding.

5.2.10.1 Benefits of breastfeeding

A majority of the respondents, both male and female, who chose to answer the question regarding factors that influence their attitudes toward breastfeeding, provided positive responses. The context of the positive responses is consistent with previous studies (Cusson, 1985; Friel et al., 1989; Hannon et al., 2000; Leffler, 2000). The positive responses include health benefits of breastfeeding and infant-maternal attachment.

5.2.10.2 Embarrassment toward breastfeeding

In the current study only a few respondents identified embarrassment towards breastfeeding as an influence on the decision to breastfeed. One third of the respondents gave a neutral response when faced with the statement '*breastfeeding is embarrassing*' and about a quarter of the respondents disagreed with breastfeeding being embarrassing. Only 9.2% of the respondents agreed with the statement. This does not support other studies where embarrassment has been seen as a common barrier to breastfeeding among adolescents (Ellis, 1983; Forrester et al., 1997; Gregg, 1989; Wolinski, 1989), and a negative factor in the attitudes toward breastfeeding (Friel, et al., 1989; Greene et al., 2003; Hannon et al., 2000). However, Dr Jane Scott (personal communication, 11th October 2005) found the current finding interesting but not unexpected as a second Perth Infant Study conducted over 2002/3 (Scott, Binns, Graham & Oddy, in press) indicated an almost universal breastfeeding initiation rate of 93%, meaning that breastfeeding is now the social norm. Therefore a shift in adolescent attitudes toward breastfeeding may be in keeping with the high initiation rate seen in the Perth study.

5.2.10.3 Influence of society, family and significant others

Family and significant others are important as sources of influential information in relation to breastfeeding. In this and other studies the adolescent's family, especially the adolescent's mother, is reported as an important influence on the adolescent's attitudes toward breastfeeding, whether this be negative or positive (Hannon et al., 2000; Wiemann et al., 1998; Yeo et al., 1994). Thus, mothers of adolescents may be an important source of information and therefore should be included in breastfeeding education and health promotion interventions. It has also been reported that where positive cultural breastfeeding influences are not present it is important that breastfeeding information and role modelling is provided (Greenwood & Littlejohn, 2002).

5.2.11 Breastfeeding future children

Consistent with the literature the majority of the respondents indicated their intention to have their own children breastfed (Cusson, 1985; Forrester et al., 1997; Gregg, 1989; Hannon et al., 2000). The current study further supports previous studies that indicate adolescent students' attitudes toward breastfeeding methods begin to form well before pregnancy. However, many adolescents have not yet made a firm decision on infant feeding methods (Greenwood & Littlejohn, 2002; Leffler, 2000; Maehr et al., 1993). Hence, breastfeeding education and health promotion emphasising breastfeeding as the optimal nutritional basis is supported for both primary and secondary school students to promote positive breastfeeding attitudes in potential future parents.

5.3 THEORETICAL IMPLICATIONS OF FINDINGS

The findings of the current study reflect Bandura's self-efficacy theory (1977). Society, family and significant others as an influence on the adolescent's perception of breastfeeding is evident. Observations from the current study suggest that social modelling is important in developing positive breastfeeding beliefs in adolescent secondary school students.

The findings of this and other studies indicate that the exposure to breastfeeding influences students' decision on infant feeding methods (Cusson, 1985; Friel et al., 1989; Leffler, 2000). This supports the notion of breastfeeding as a socially learned behaviour and relates to two of the four sources of efficacy information within self-efficacy theory; verbal persuasion, and observational learning through the exposure to role models. Typically, where adolescent students have greater exposure to breastfeeding with a family who is supportive of breastfeeding, they also have more positive attitudes toward breastfeeding.

It has been suggested that breastfeeding and lactation information needs to be provided from an early age so that learning can occur at appropriate stages of cognitive development (Mackay, 1995). Educational strategies that use the four sources of efficacy information are more likely to build task-orientated confidence to adopt certain behaviours. Although two of the efficacy information sources, enactment and the related physiological feedback, are not appropriate for this study, strategies such as verbal persuasion, media or role-play could be used. Observation of others increases the likelihood of future behaviour uptake (Bandura, 1977). Watching women breastfeeding coupled with verbal encouragement from influential others such as family, friends and peers enhances cognitive attainment and self-confidence in the adolescent student. Consistent with previous studies (Friel et al., 1989; Forrester et al., 1997) participants in this study reported positive influence of breastfeeding information via mass media campaigns.

5.4 LIMITATIONS OF THE STUDY

It is important to restate the limitations in the current study mentioned in chapter one. The generalisability of the study is limited by the nature of the convenience sample. There was also an unavoidable bias in the sample selection process due to the method of invitation to schools to participate. Community-based high school nurses were invited to participate in the project, and were given information on their role in the research process. The nurses chose to participate based on the decision of their current workload, nurse staffing levels and ultimately the consent of the school Principal for participation. Hence, there is unevenness in the type of school and number of rural and metropolitan students surveyed in the current study, with approximately two-thirds of the students being metropolitan and with only one Catholic non-government school involved in the study.

The Australian Bureau of Statistics (2001) comparisons suggest that the sample in the current study does not reflect the multi-cultural nature of

Australian society. Hence, the cultural influences on breastfeeding knowledge and attitudes toward breastfeeding are not assessed in the current study. A high proportion of the students are white Caucasian.

Demographic data did not include economic status of the students' parents even though it is widely accepted that there is lower breastfeeding rates in lower income groups (Hoddinott & Pill, 1999; Scott et al., 1997). It was felt by the researcher that the majority of secondary school students would not be able to provide this type of information. However, this study did include the participating students' mother and father's education levels and occupation status to give an indication of some factors that may influence adolescents' breastfeeding knowledge and attitudes.

Another limitation relates to reliability. The Cronbach alpha reliability of .65 for the ATBF scale indicates moderate internal consistency in the scale items. This was lower than in Cusson's (1985) study where the Spearman-Brown Corrected Split Half (odd-even) Index was .83. This may reflect variations in responses from the different subgroups within the students or that the Cronbach alpha is more sensitive than the Spearman-Brown Corrected Split Half (odd-even) Index (Nunnally, 1978). Nevertheless, a Cronbach alpha of .5 to .7 is acceptable if the analysis involves comparison between groups (Aday, 1996) as was the case in the current study. By contrast the Cronbach alpha for the BFK scale was only minimal ($\alpha = .33$) for this sample of secondary school students and lower than in previous studies (Cusson 1985; Friel et al., 1989). The reason for this could be a more diverse sample of adolescent secondary school students was obtained from eight secondary schools in different geographic locations for this current study. A low alpha reflects high content validity which is desirable when knowledge in a variety of areas is being determined, as is case in this study (Mike Phillips, Statistician, personal communication, 13th September 2004). However, this diversity and inclusion of both genders in the survey could have had a negative impact on the scale reliability.

The reliability of a measure can be improved by adding more items, by improving the scale's item homogeneity through factor analysis (reveals subscales), or revising the items to remove those that consistently score high or low (lack discrimination), or by administering the test to a more heterogeneous group (Thomas, 1990). Hence, studies designed to further the psychometric testing of Cusson's (1985) instrument in Australia are recommended. Given the constraints of time and resources consistent with a Masters thesis further psychometric testing of Cusson's scale was not undertaken.

Caution is needed when considering factors that influence attitudes toward breastfeeding as over fifty percent of students in the current study did not contribute information to this area. These students either answered 'no' when asked if they could identify any factors that would influence their attitudes toward breastfeeding or did not answer the question.

5.5 IMPLICATIONS OF THE STUDY

A major implication that can be drawn from the current study is that secondary school students have insufficient breastfeeding knowledge and unmet information needs. Information pertinent to the health benefits of breastfeeding need to be included in health and nutrition education. Community-based high school nurses, as primary health care providers, are a key element in health education and health promotion in the school setting (Downie, Chapman, Orb, & Juliff, 2002). Schools are recognised as the optimum location for health promotion and health education for adolescents. Schools can provide the opportunities for the role modelling of positive breastfeeding attitudes, positive peer supports (verbal persuasion) and consistent support from the school community health and educational professionals (Hern, Gates, Amlung, & McCabe, 1998). High school nurses in partnership with teachers can ensure that basic student health curriculum needs, such as nutrition, are met. Nutrition would include the promotion of

breastfeeding as the ideal nutritional basis for infants and the building block for future optimal health.

It is important that community-based high school nurses and relevant health professionals working with adolescent secondary school students utilise the sources of efficacy information in their teaching strategies. Such strategies would assist with the delivery of effective health education and promotion in relation to the importance of breastfeeding and the building of efficacy beliefs related to ability to breastfeed that could translate to appropriate breastfeeding behaviour.

In addition, peer influence is a critical motivator for the adolescent age group (Ineichen et al., 1997a; Podgurskie, 1995), and the adolescent period is recognised as the developmentally appropriate time for group education with peers (Hern et al., 1998). In an environment that values breastfeeding as beneficial and the optimal infant feeding choice, verbal persuasion and role modelling by peers may enhance positive breastfeeding attitudes in the adolescent or older student.

The community-based high school nurses, through a partnership approach, are in an ideal position to influence and support students through their connection with peer groups by being the vehicle for information provision and sharing. Active listening rather than talking at the adolescent reinforces a non-judgemental attitude on the part of the health professional (Deering & Jennings, 2002). A partnership approach that promotes respect and consideration of the adolescent's viewpoint, and encourages the building of rapport with adolescent students is important for the promotion of task specific efficacy beliefs.

5.6 RECOMMENDATIONS

There are a number of recommendations based on the findings of the current study, including those already discussed under implications of the study.

These recommendations reflect those found in previous adolescent breastfeeding knowledge and attitude literature (Cusson, 1985; Forrester et al, 1997; Kim, 1998; Leffler, 2000). They include the implementation of evidence-based health promotion and education programs, public health campaigns and further research to meet the needs of adolescent secondary school students in regards to increasing breastfeeding knowledge and promoting positive attitudes. The current study is able to contribute to the recommendations by highlighting the breastfeeding knowledge present in the adolescent secondary students surveyed and by eliciting from these students influences that may contribute to positive and negative adolescent breastfeeding attitudes.

5.6.1 Education and health promotion for health professionals

The development of lactation and breastfeeding education for health professionals working with primary and secondary school students may enhance and increase their breastfeeding knowledge and confidence in lactation education. Lactation education for health professionals has been shown to produce more positive and supportive breastfeeding attitudes (Downie, Juliff, & Rakic, 2001). These lactation-educated health professionals may then be utilised and seen as appropriately trained and supportive teaching resources within the school setting. As supportive teaching resources community-based high school nurses could present breastfeeding information and education through verbal persuasion to increase self-confidence in adolescent students who are exposed to this information. Previous studies have indicated that students requested more information on breastfeeding (Gregg, 1989; Wolinski, 1989) and that students thought more breastfeeding information would dispel myths about breastfeeding (Gregg, 1989; Forrester et al., 1997). In the current study several students stated that they did not know anything about breastfeeding which suggests that breastfeeding might not have been discussed within their school or home environment. This and other studies recommend health professionals in school environments consider utilising strategies that directly relate to verbal persuasion and observational learning such as the use of

nursing mothers' demonstrations and interactive teaching aids to provide breastfeeding information to adolescents (Friel et al., 1989; Goulet et al., 2003). This social modelling via 'live' demonstrations may assist in dispelling myths about breastfeeding. Other students in the study indicated that they obtained breastfeeding information through human biology and early childhood classes. Health education and promotion that portrays breastfeeding as the cultural norm is optimal.

5.6.2 Public breastfeeding campaign

For adolescent students to accept breastfeeding as a norm, there is a need for societal attitudes to change towards supporting a breastfeeding friendly environment. Students in the current study indicate that society and families, especially their mothers, are influential in regards to their infant feeding preferences.

Consistent with self-efficacy theory and the sources of efficacy information audiovisual media has been shown to influence adolescents' behaviour and hence attitudes (Friel et al., 1989) through the utilisation of verbal persuasion and vicarious experience of observational learning. Hence this type of medium may be advantageous as a vehicle for a breastfeeding campaign to increase knowledge and enhance positive breastfeeding attitudes. It is suggested that the use of visual media such as television, videos and computer games focused on breastfeeding and lactation be developed and used as teaching aides (Kim, 1998; Kennedy, 2000). Radio, television and newspapers have been promoted as avenues to publicise positive breastfeeding messages (Forrester et al., 1997). A more breastfeeding friendly environment may reduce the barriers and adolescent misconceptions about breastfeeding (McIntyre et al., 2001b). Some adolescent students in the current study indicate that breastfeeding information was obtained through television and reading which would suggest the use of audiovisual media as a useful conduit for dissemination of breastfeeding information.

5.6.3 Suggestions for future research

Some of the findings of current study have implications for future research. These relate to the extension of the focus of the research, replication across a representative Australian school population and further psychometric testing of the Adolescent Knowledge and Attitude to Breastfeeding questionnaire.

Further research to extend the focus of the study should consider qualitative methods. A research project to enrich the type of information gained to date and to obtain a qualitative perspective from adolescent secondary school students in relation to their breastfeeding knowledge, attitudes and intention to breastfeed is recommended. The possible reasons for the change in the level of adolescent embarrassment toward breastfeeding in this study, which differs from previous studies, could also be explored. The utilisation of adolescent secondary school students in focus groups may assist with this.

Alternatively, replication of the current study using a proportionate stratified random sample of Western Australian students may ensure a multicultural sample and allow for generalisability. The inclusion of more multicultural secondary schools may allow for cultural comparison of adolescent breastfeeding knowledge and attitudes not possible in the current study.

5.7 CONCLUSION

The results of this descriptive study are derived from self-report questionnaires completed by student participants. Within the limitations of the current study, the research provides insight into adolescent secondary school students' knowledge and attitudes toward breastfeeding. This will assist in the understanding and development of health promotion and education support relating to breastfeeding required for the adolescent school student for the enhancement of positive breastfeeding attitudes.

The theory driving this research was Bandura's self-efficacy theory (1977) as the information on adolescents' observational learning and exposure to role models and their beliefs have an impact on breastfeeding attitudes. Behaviour is regulated through efficacy beliefs about the person's ability to breastfeed, perceived benefit if the behaviour is adopted, and perceived barriers preventing the adoption of the new behaviour or behavioural change (Bandura, 1997).

As the precursor to behavioural changes, the findings from the current study support previous research by Cusson (1985), Friel et al. (1989) and Wolinski (1989) regarding adolescent secondary school students' knowledge and attitudes toward breastfeeding and provide more contemporary evidence of the current situation. Hence, this study concludes that secondary school students in Western Australia continue to have less than ideal knowledge of breastfeeding. Nevertheless, findings are consistent with previous research in that there is higher breastfeeding knowledge in the higher grades for both male and female students. For both year groups, female students have the higher breastfeeding knowledge scores than male students. With regards to attitudes toward breastfeeding, students have a tendency for neutral responses to attitude questions. However, overall and for both year groups, female students are more positive in their attitudes to breastfeeding than male students. More positive attitudes about breastfeeding are found in students with exposure to and knowledge of breastfeeding. The comparison of rural and metropolitan students found that metropolitan students have higher breastfeeding knowledge and are more positive toward breastfeeding than rural students. Both rural and metropolitan year-12 female students have higher breastfeeding knowledge and are more positive towards breastfeeding than any other combination of students. Breastfeeding information sources are mainly obtained via media, mother and family members with sources of efficacy information being more prominent in female students than males. The current study suggests that adolescent breastfeeding misconceptions and adolescent breastfeeding knowledge need to be addressed in the early years of development in order to increase breastfeeding knowledge, promote positive attitudes, and normalise

breastfeeding. In order to normalise breastfeeding, education and health promotion activities need to be guided by the sources of efficacy information in relation to the benefits of breastfeeding. The target groups should include early school age children as well as adolescent secondary school students.

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APPENDIX 1: Adolescent knowledge and attitudes to breastfeeding questionnaire

COMMUNITY & WOMEN'S HEALTH SERVICE FREMANTLE
CURTIN UNIVERSITY OF TECHNOLOGY

ADOLESCENT KNOWLEDGE AND ATTITUDES TO BREASTFEEDING

Thank you for agreeing to complete this questionnaire. As you already know, it is completely unrelated to your school work and it will not affect your school grades. All responses to the questionnaire will be kept confidential and will be destroyed once the survey is complete.

In completing the questionnaire, **please colour in the circle corresponding to your answer.** Guessing is preferable to not answering. Answer all questions honestly. Remember there is no "pass" or "fail".

OFFICE USE ONLY										
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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**COMMUNITY & WOMEN'S HEALTH SERVICE FREMANTLE
CURTIN UNIVERSITY OF TECHNOLOGY**

SECTION 1: BACKGROUND INFORMATION

1. Male 1
 Female 2

2. How old are you?

- 13 or less-14 yrs 1
 15 yrs 2
 16 yrs 3
 17 yrs 4
 18 yrs 5
 >18 yrs 6

3. What school do you attend?

- State Government 1
 Catholic private 2
 Non-catholic private 3
 Community college 4
 Other 5

4. Which year are you in at school?

- Year 8 1
 Year-9 2
 Year 10 3
 Year 11 4
 Year-12 5

5. Your Postcode:

OFFICE USE ONLY									
0	1	2	3	4	5	6	7	8	9
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. What is the highest level of education achieved by your father?

- High School 1
- Apprenticeship/Trade 2
- University Degree 3
- Postgraduate Qualification 4
- Unsure 5
- Not Applicable 6

7. What is the highest level of education achieved by your mother?

- High School 1
- Apprenticeship/Trade 2
- University Degree 3
- Postgraduate Qualification 4
- Unsure 5
- Not Applicable 6

8. What is your father's occupation?

- My father's occupation is 1
- Unemployed 2
- Not applicable (Do not have a father) 3

9. What is your mother's occupation?

- My mother's occupation is 1
- Unemployed 2
- Not applicable (Do not have a mother) 3

10. What is your ethnic background?

- White Caucasian 1
 - Australian Aboriginal 2
 - Black African 3
 - Asian 4
 - Middle Eastern 5
 - Other 6
- (Please state) _____

SECTION 2: KNOWLEDGE

DIRECTIONS

Please colour in the circle corresponding to the most appropriate answer. Guessing is preferable to not answering.

11. Which of the following substances is contained in breast milk?

- Sugars 1
- Protein 2
- Immune Factors 3
- All of the above 4

12. Which of the following substances is transmitted from mother to baby in breast milk?

- Aspirin 1
- Cold medicine 2
- Nicotine from cigarettes 3
- All of the above 4

13. What is colostrum?

- A specialized fluid formed in the breast before breast milk 1
- A residue left in the breast after feeding 2
- A fluid left in the breast after the baby is weaned 3
- A pus produced when the breast is infected 4

14. What is the most important benefit of colostrum?

- It causes the baby to have regular bowel movements 1
- It is a source of nutrition and immunities 2
- It improves the baby's sucking ability 3
- It is less irritating to the stomach than ordinary milk 4

15. When is colostrum usually replaced by true breast milk?

- Before delivery 1
- At delivery 2
- 2-3 days after delivery 3
- 1 week after delivery 4

16. In what quantity is breast milk supplied?

- More than the baby needs 1
- Less than the baby needs 2
- In the amount the baby needs 3

17. Can breast milk be produced by all women?

- Almost all 1
- Only about one-half 2
- Only a few 3
- Almost none 4

18. What is the proper diet for the breastfeeding mother?

- She should eat twice as much 1
- She should diet to regain her pre-pregnant weight 2
- She should eat a well balanced diet with lots of fluid 3
- What she eats is not important, but she should drink one quart of milk per day 4

19. Breastfeeding has been shown to help prevent ... in the baby.

- allergy 1
- infection 2
- obesity (overweight) 3
- all of the above 4

20. Why is breast milk better for the baby than commercial formulas?

- It contains trace elements and antibodies 1
- It has more calories and vitamins 2
- It is richer in sugars and fats 3
- It contains hormones that the baby needs for proper growth 4

21. The “let down” reflex releases the breast milk to the suckling baby. This reflex is most affected by ...

- the mother’s emotional state 1
- the amount of milk in the breast 2
- how hard the baby sucks 3
- the length of time since the last feeding 4

22. The mother must stop nursing if she has ...

- to return to work/school 1
- a clogged milk duct 2
- a cold or a virus 3
- none of the above 4

23. The mother’s body benefits from breastfeeding in which of the following ways?

- It helps the uterus to contract to its pre-pregnant state 1
- It increases the size of the breasts after the baby is weaned 2
- It helps the stretch marks disappear 3
- The mother loses fat from her own body into her breast milk 4

24. The ability of the mother to provide enough breast milk to meet the needs of the baby is most strongly influenced by ...?

- the mother’s physical and emotional condition 1
- the size of the mother’s breast 2
- the maximum length the mother allows the baby to nurse 3
- the addition of the bottle-feeding if the baby is hungry 4

25. When should the baby be weaned from the breast?

- When the baby’s teeth come in 1
- At the age of 6 months 2
- When the mother feels the time is right 3
- When the baby can drink from a cup 4

26. Weaning the baby from the breast can be accomplished more easily by ...

- a) cutting out middle feeding of the day first and leaving the morning and night 1
- b) weaning the baby gradually over a month or longer 2
- c) discontinuing breast feeding completely and substituting formula or food at feeding time 3
- d) answers a and b 4

27. It is suggested that, for a breastfed baby, solids be introduced at ...

- 1 month 1
- 3 months 2
- 6 months or later 3

28. Breastfeeding is most advantageous if begun ...

- immediately after delivery 1
- within the first 24 hours of life 2
- after the baby has been fed with water or formula 3

29. The best way to get the baby to grasp the nipple when beginning to breast-feed is to ...

- put the nipple in his mouth 1
- brush his cheek with the nipple so he turns to grasp it 2
- open his mouth with your finger and insert the nipple 3
- pinch his cheeks together to get him to open his mouth 4

30. A mother is breastfeeding her first baby. She should ...

- offer half a bottle of formula after he finishes breast feeding 1
- alternate which breast she offers first at each feeding 2
- wake the baby during the night if he sleeps longer than four hours at a time 3

SECTION 3: ATTITUDE

DIRECTIONS

There are five possible responses to each of the items below: SA – Strongly Agree; A – Agree; N – Neutral; D – Disagree; SD – Strongly Disagree.

Please colour in the circle corresponding to the letter that best describes your response to each statement.

	SA	A	N	D	SD
31. Breastfeeding ties you down.	○	○	○	○	○
32. Breastfeeding is more convenient.	○	○	○	○	○
33. Breastfeeding provides more freedom.	○	○	○	○	○
34. Breastfeeding improves the appearance of the breast.	○	○	○	○	○
35. Breastfeeding makes the breast less attractive.	○	○	○	○	○
36. Breastfeeding is more attractive to the partner.	○	○	○	○	○
37. The baby enjoys the breast more than the bottle.	○	○	○	○	○
38. Breastfeeding is healthier for the baby.	○	○	○	○	○
39. Breastfeeding provides insufficient milk.	○	○	○	○	○
40. Breastfeeding may not provide the right kind of milk.	○	○	○	○	○
41. Bottle-feeding is more hygienic.	○	○	○	○	○
42. Breastfeeding provides a closer link with the mother.	○	○	○	○	○
43. There is less chance of an infection in the baby with breastfeeding.	○	○	○	○	○
44. Breastfeeding provides the amount of milk the baby needs.	○	○	○	○	○
45. Breastfeeding requires special skill.	○	○	○	○	○
46. Breastfeeding is better for recovering the figure.	○	○	○	○	○
47. Breastfeeding is embarrassing.	○	○	○	○	○
48. All things considered, breastfeeding and bottle-feeding are about equal.	○	○	○	○	○

SECTION 4: GENERAL QUESTIONS

DIRECTIONS

There are three possible responses to each of the items below: YES (Y), NO (N) and UNCERTAIN (U).

Please colour in the circle corresponding to the letter that best describes your response to each statement.

	Y	N	U
49. Were you breastfed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. Were any brothers or sisters breastfed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Have you ever seen anyone breastfeed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Have you seen any movies on breastfeeding?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. Have you seen a baby breast feed on TV?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. Have you read about breastfeeding?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Has breastfeeding been mentioned in any of your classes?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

56. Can you identify any significant factors influencing your attitude towards breastfeeding?

.....

.....

.....

.....

57. If female, have you ever considered breastfeeding any future children?

.....

.....

58. If male, would you encourage your partner to breastfeed any future children?

.....

.....

The next four questions are only for students who have become mothers or fathered a child. If the questions are not applicable to you, thank you very much for your participation in the survey.

59. Have you ever become a father?

- Yes 1
- No 2
- Not applicable (female) 3

60. Have you ever become a mother?

- Yes 1
- No 2
- Not applicable (male) 3

61. If you are a mother, have you ever breastfed?

- Yes 1
- No 2

62. If you are a father, has your child ever been breastfed?

- Yes 1
- No 2

THANK YOU VERY MUCH

APPENDIX 2: Breastfeeding survey information letter

April 2001

Dear Parents of students in Years 9 and Year-12,

Your school Principal has consented to the students in years 9 and 12 participating in a research project entitled “Knowledge and Attitudes of Adolescent Males and Females to Breastfeeding”. The project is being conducted by your School Nurse with the support of the teachers.

Research has indicated that adolescents hold common misconceptions about breastfeeding that appear to result from their limited knowledge and varied attitudes in regard to lactation. This project, therefore, seeks to determine what knowledge and attitudes Year-9 and Year-12 students have to breastfeeding. The study will examine these two factors to identify what information or further education may be required for school students.

If parents have no objection and students are agreeable, Year-9s and Year-12s will be asked, in term two, to complete a breastfeeding questionnaire in class. If you do not wish your child to participate in the study please instruct your child not to complete the questionnaire when presented with it in class. Anonymity of all students will be protected, no names will be used on the questionnaires, and those who do not wish to participate will not be identified.

All questionnaires will be secured by the researchers according to ethical guidelines. Permission to conduct the study has also been obtained from the District Education Office and the Fremantle Hospital & Health Service Ethics Committee. All students will be given the answers to the knowledge questions after completing the questionnaire and results of this study will also be made available to the school.

If you have any further questions about this research project, or any concerns, please contact your School Nurse or the Researcher Dianne Juliff (9339 1362).

APPENDIX 3: Student information sheet

Fremantle Hospital & Health Service Community and Women's Health, Fremantle

Information Sheet

Knowledge and attitudes of adolescent males and females to breastfeeding

My name is Dianne Juliff and I am the nurse researcher in a study that is evaluating knowledge and attitudes of Year-9 and Year-12 male and female students to breastfeeding. The study is being conducted in the Fremantle Health Service, the West Pilbara Health Service and Bunbury Health Region to gain a metropolitan and a rural perspective.

NATURE AND PURPOSE OF THE STUDY

You are invited to participate in a study the purpose of which is to examine the knowledge and attitudes of adolescent males and females to breastfeeding. It is known that knowledge and attitudes may affect breastfeeding rates and duration among teenagers and adults in parenthood. It is anticipated the study will determine any unmet information needs you might have in this area and highlight possible educational requirements necessary to ensure a positive attitude and increased knowledge of breastfeeding for future reference in parenthood.

WHAT WILL THE STUDY INVOLVE

Your School Principal has agreed to your school being involved in this research and your parents are aware that the study is being conducted in the school. If you consent to take part, you will be asked to complete a questionnaire on knowledge and attitudes to breastfeeding that will take about 20 minutes. The questionnaire will be completed in the classroom at a time convenient to your schoolteacher and school health nurse.

VOLUNTARY PARTICIPATION AND WITHDRAWAL FROM THIS STUDY

Your participation in this study is entirely voluntary. If for any reason you wish to withdraw from the study you may do so without it affecting your student status, grades or care by the school nurse. In such cases, the record of that participant will be destroyed, unless otherwise agreed.

At no time will you be identified by the information you have given and any reports or articles written concerning the outcomes of the study will protect your confidentiality and anonymity. The information obtained during the study, and the computer disc on which data is filed, will be stored in a locked cupboard during the study period. Thereafter it will be stored at Fremantle Hospital and Health Service for five years after the completion of the study and then destroyed.

This study is significant because there is very little research in this area and it will provide much needed data concerning adolescents' knowledge and attitudes to breastfeeding. The study will thereby provide evidence concerning the potential need for lactation and breastfeeding education in the secondary school setting. It is

suggested that education in adolescence is necessary to promote a sound knowledge base and positive attitudes toward breastfeeding.

If you have any questions please talk to the school health nurse or contact me on (08) 9339 1362. In addition, if you have any complaints or concerns about the conduct of this research you may contact the Chairman of the Fremantle Hospital & Health Service Human Research Ethics Committee on 9431 2929.

Thank you for taking the time to read the information sheet.

Mrs Dianne Juliff RN RM BSc(Nsg)
Nurse Researcher

APPENDIX 4: Consent form

Fremantle Hospital & Health Service Community and Women's Health, Fremantle

Consent Form

TO BE USED IN CONJUNCTION WITH THE INFORMATION SHEET

Knowledge and attitudes of adolescent males and females to breastfeeding

Principal's name:..... School Name:.....

1. I agree entirely voluntarily to allow students in years 9 and 12 to take part in the above named research study.
2. I have been given a full explanation of the purpose of this study, of the procedures involved and of what will be expected of the students.
3. I agree to inform the nurse or the investigator of any undue stress that the school community may experience as soon as possible.
4. I understand that I am entirely free to withdraw my school from the study at any time and that this withdrawal will not in any way affect the school.
5. I understand that the school will not be referred to by name in any report concerning this study. In turn, I cannot restrict in any way the use of the results that arise from this study.
6. I have been given and read a copy of the Informed Consent Form and Information Sheet.

Principal's Signature..... Nurse's signature.....

Name (PRINT)..... Name (PRINT).....

Date..... Date.....

I, _____ have read the information sheet accompanying this consent form and any questions I have asked have been answered to my satisfaction. I agree to students in years 9 and 12 participating in this study by completing a questionnaire. I will give parents and students the opportunity not to be involved in this study if they choose. I realise that I may withdraw the school from the study at any time without prejudice. I agree that research data gathered for the study may be published provided my school's name or other identifying information is not used.

I understand that if I have any questions or concerns I can discuss these with the School Health Nurse or contact the nurse researcher Dianne Juliff on (08) 93391362 or Associate Professor Jill Downie, Nurse Research Consultant in Community and Women's Health on (08) 9266 3024 (work).

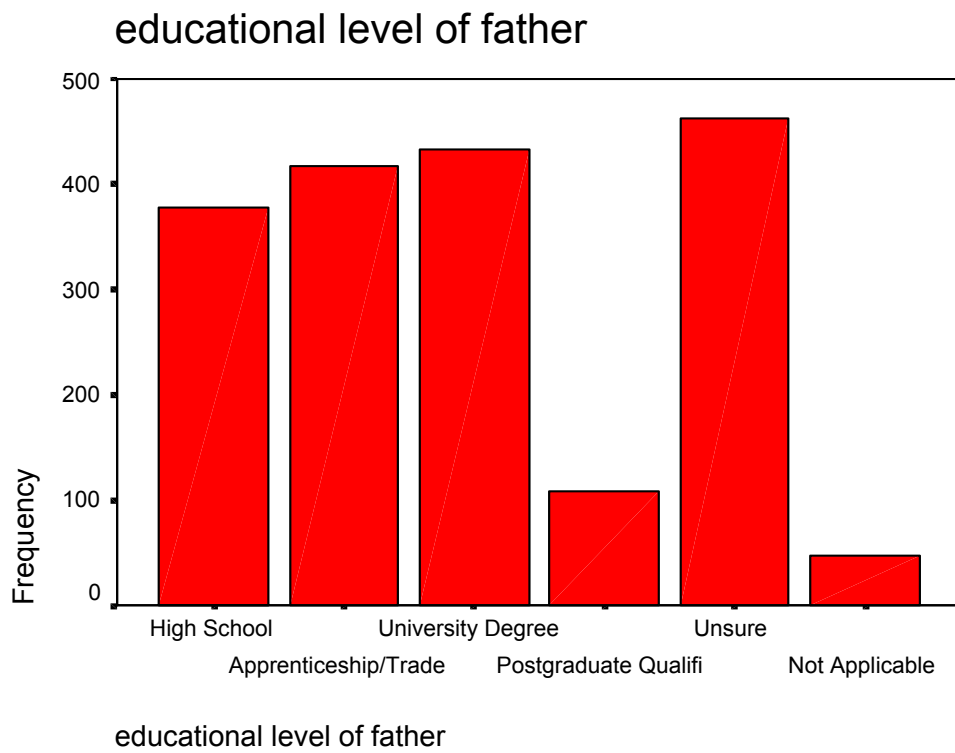
Principal

Date

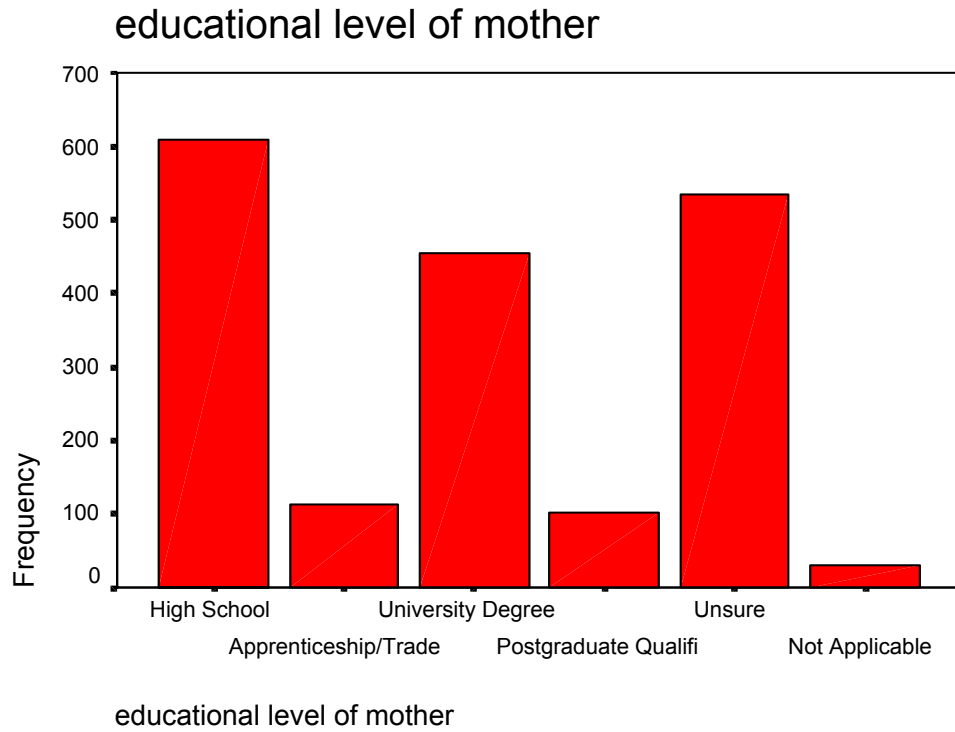
School Health Nurse

Date

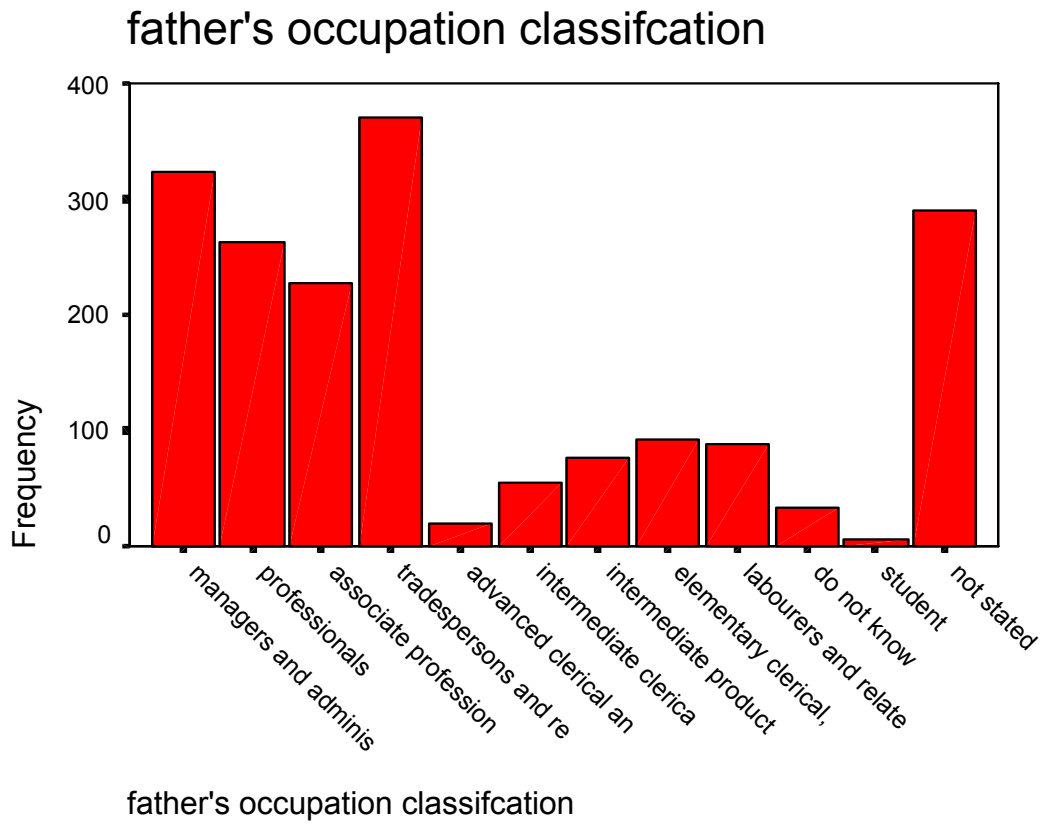
APPENDIX 5: Educational levels of respondents' fathers



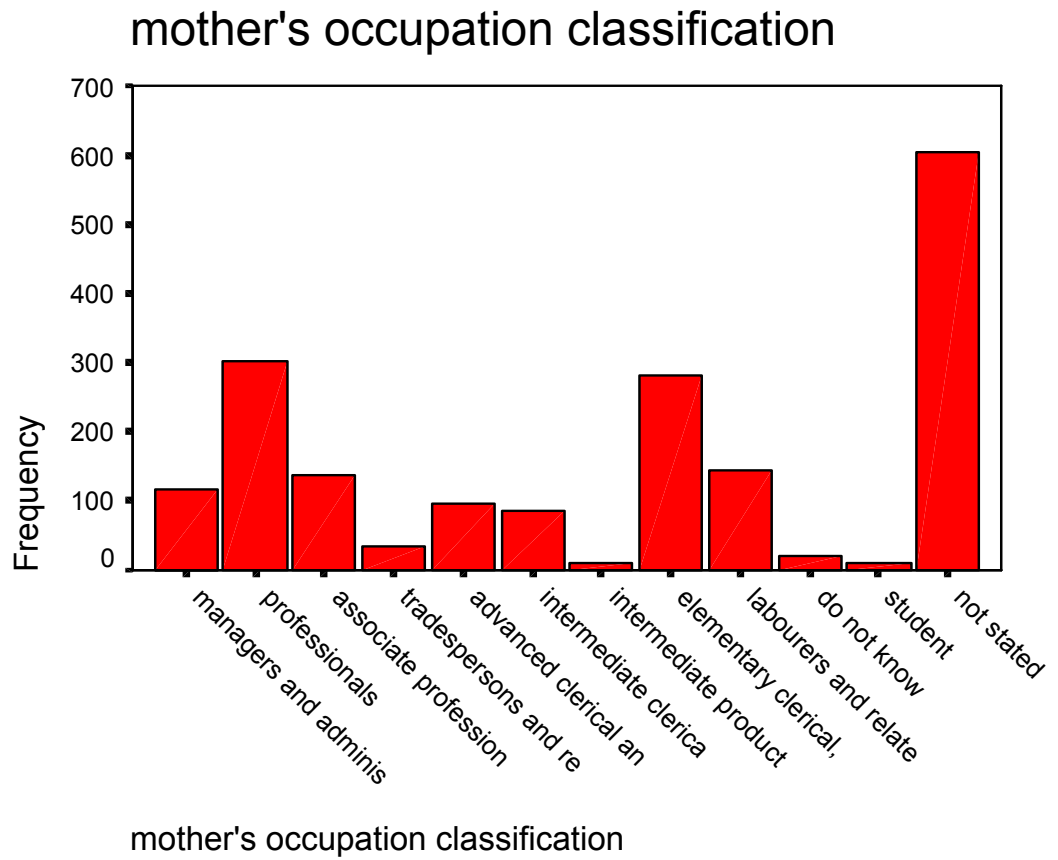
APPENDIX 6: Educational levels of respondents' mothers



APPENDIX 7: Occupation classifications of respondents' fathers



APPENDIX 8: Occupation classifications of respondents' mothers



**APPENDIX 9: Correct knowledge responses for all
knowledge items**

Breastfeeding Knowledge Question	Total		Male		Female		Year-9		Year-12		Rural		Metropolitan	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q11 Which of the following substances is contained in breast milk?	1095	59.3	538	59.8	557	59	531	49	564	74	283	56.6	812	60.3
Q12 Which of the following substances is transmitted from mother to baby in breast milk?	1020	55.3	456	50.6	564	59.6	513	47.3	507	66.5	267	53.4	753	55.9
Q13 What is colostrum?	1280	69.4	567	63	713	75.4	708	65.3	572	75	315	63	965	71.7
Q14 What is the most important benefit of colostrum?	1110	60.2	502	55.8	608	63.4	573	52.9	537	70.4	263	52.6	847	62.9
Q15 When is colostrum usually replaced by true breast milk?	687	37.2	309	34.3	378	40	361	33.3	326	42.7	186	37.2	501	37.2
Q16 In what quantity is breast milk supplied?	912	49.2	409	45.4	503	53.2	519	47.9	393	51.5	244	48.8	668	49.6
Q17 Can breast milk be produced by all women?	1664	90.2	782	86.8	882	93.3	968	89.3	696	91.3	425	85	1239	92.1
Q18 What is the proper diet for the breastfeeding mother?	1457	79	641	71.2	816	86.3	815	75.2	642	84.2	357	71.4	1100	81.7
Q19 Breastfeeding has been shown to help prevent... ...in the baby.	915	49.6	440	48.8	475	50.2	509	47	406	53.2	232	46.4	683	50.7
Q20 Why is breast milk better for the baby than commercial formulas?	654	35.4	287	31.8	367	38.8	298	27.5	356	46.7	148	29.6	506	37.6
Q21 The "let down" reflex releases the breast milk to the suckling baby. This reflex is most affected by?	259	14	141	15.6	118	12.4	166	15.3	93	12.2	83	16.6	176	13

Breastfeeding Knowledge Question Cont.	Total		Male		Female		Year-9		Year-12		Rural		Metropolitan	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Q22 The mother must stop nursing if she has	412	22.3	176	19.5	236	24.9	222	20.5	190	24.9	112	22.4	300	22.3
Q23 The mother's body benefits from breastfeeding in of the following ways?	511	27.7	212	23.5	299	31.6	254	23.4	257	33.7	121	24.2	390	29
Q24 The ability of the mother to provide enough breast milk to meet the needs of the baby is most strongly influenced by	449	24.3	202	22.4	247	26.1	262	24.1	187	24.5	125	25	324	24
Q25 When should the baby be weaned from the breast?	419	22.7	243	27	176	18.6	240	22.1	179	23.4	105	21	314	23.3
Q26 Weaning the baby from the breast can be accomplished more easily by	1042	56.5	451	50.1	591	62.5	580	53.5	462	60.6	243	48.6	799	59.4
Q27 It is suggested that, for a baby, solids be introduced at	1002	54.2	462	51.3	540	57.1	589	54.3	413	54.2	273	54.6	729	54.2
Q28 Breastfeeding is most advantageous if begun.....	492	26.7	234	26	258	27.3	265	24.4	227	29.7	132	26.4	360	26.7
Q29 The best way to get the baby to grasp the nipple when beginning to breastfeed is to	841	45.6	365	40.5	476	50.3	418	38.6	423	55.5	196	39.2	645	47.9
Q30 A mother is breastfeeding her first baby. She should.....	1316	71.3	581	64.5	735	77.7	708	65.3	608	79.7	323	64.6	993	73.8

APPENDIX 10: Attitude score percentage

ATTITUDE QUESTIONS	SD%	D%	N%	A%	SA%
Q31. Breastfeeding ties you down	9.5	21.2	35.6	25.3	8.4
Q32. Breastfeeding is more convenient	17.6	35.6	30.2	13.3	3.3
Q33. Breastfeeding provides more freedom	6.8	15.5	41.5	27.4	8.8
Q34. Breastfeeding improves the appearance of the breast	6.8	8.8	37.5	29.5	17.3
Q35. Breastfeeding makes the breast less attractive	15.9	23.6	40.8	12.1	7.6
Q36. Breastfeeding is more attractive to the partner	7.1	11.3	47.1	22.8	11.6
Q37. The baby enjoys the breast more than the bottle	19.6	35.3	35.7	5.9	3.4
Q38. Breastfeeding is healthier for the baby	51.4	31.3	11.5	3.1	2.8
Q39. Breastfeeding provides insufficient milk	23.9	36.5	26.2	8.1	5.4
Q40. Breastfeeding may not provide the right kind of milk	30.0	35.5	21.6	8.7	4.2
Q41. Bottle-feeding is more hygienic	16.9	33.9	32.3	11.2	5.7
Q42. Breastfeeding provides a closer link with the mother	30.8	36.9	22.6	7.3	2.3
Q43. There is less chance of an infection in the baby with breastfeeding	20.8	33.8	32.6	9.1	3.7
Q44. Breastfeeding provides the amount of milk the baby needs	21.0	45.2	25.3	6.2	2.3
Q45. Breastfeeding requires special skills	17.9	36.6	32.0	8.5	5.1
Q46. Breastfeeding is better for recovering the figure	7.0	16.3	48.0	21.0	7.6
Q47. Breastfeeding is embarrassing	19.0	25.1	32.3	14.3	9.3
Q48. All things considered, breastfeeding and bottle-feeding are about equal	15.0	33.1	33.9	12.9	5.2

APPENDIX 11: Sources of efficacy information

Question: Can you identify any significant factors influencing your attitude towards breastfeeding?

Responses within each category	n	%
Actual experience		
Personal experience having breastfed own baby	1	.1
Persuasion/education		
Breastfeeding is healthy for baby	230	12.5
Breastfeeding is the natural way	123	6.6
What is reported in media & community (told, hear & read)	50	2.7
Provides antibodies and helps with immune system	26	1.4
Aids with bonding of mother and baby	25	1.4
Breastfeeding a lot easier than bottle-feeding, more convenient	10	.5
Human biology and early childhood care classes	10	.5
Protects the health of the mother	8	.4
Knowledge of breastfeeding & advantages over bottle-feeding	3	.2
Breastfeeding more hygienic & safer	2	.1
Vicarious experience/role modelling		
Mother influence	55	3.0
Family exposure to breastfeeding role model	51	2.8
Being breastfed so would breastfeed	9	.5
Not breastfed so would bottle-feed	3	.2
Emotional/physiological		
Breastfeeding caused embarrassment, natural but embarrassing	47	2.5
Breastfeeding is gross and prefer to bottle-feed	7	.4
BF inconvenient time consuming, baby too dependent on mother	6	.3
Thinks breastfeeding is great and breastfeeding is beautiful	5	.3
Aware that some women have trouble with breastfeeding	2	.1
Allergic to milk as a baby	1	.1
Breastfeeding is cool and there is nothing wrong with it	1	.1
Missing data		
Answered no to question	588	31.9
Question not answered	496	26.8
Response not relevant to question	59	3.2
Don't know anything about breastfeeding	14	.7
Answered yes to identifying factors but factors not given	13	.7
Total	1845	100