An Examination of Adolescent Sexual Behaviour, Knowledge and Education

by

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Submitted in partial fulfilment of the requirements for the degree of

Doctor of Psychology (Health)

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I am the author of the thesis entitled:

**An Examination of Adolescent Sexual Behaviour, Knowledge and Education**

submitted for the degree of: Doctor of Psychology (Health)

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Abstract

**Introduction:** Adolescents are considered a vulnerable population in Australia, particularly in relation to their sexual health and wellbeing. Research has shown that adolescents are more likely to engage in risky sexual behaviours, such as younger age at initiation of sexual intercourse, having multiple sexual partners and inconsistent use of contraception and condoms. This puts them at greater risk of contracting STIs and unplanned pregnancies, which can have significant negative physical and emotional consequences. Sexual education is considered the most appropriate way of addressing these concerns, by improving knowledge and, theoretically, reducing risky behaviour by promoting safer behaviour. Yet, the evidence of the impact of sexual education on improving sexual knowledge, and changing risky sexual behaviour has been inconsistent.

**Aims:** The overall aim of this thesis was to examine the relationship between adolescent sexual education, knowledge and behaviour. Broadly, it sought to expand on the past research and to provide an up to date picture of the current experiences of adolescents regarding the sexual education they receive or have access to, their levels of sexual knowledge and their experiences of risky sexual behaviour. A systematic review was conducted of studies and reviews that have been undertaken or evaluated the impact of sexual education methods on attitudes, knowledge and behaviour, to identify gaps in the literature. The number of hours of sexual education and the sources of sexual education were identified as factors requiring further examination.

**Studies:** The first empirical study of this thesis examined: 1) the sexual experiences and behaviours of Australian adolescents; 2) the contributing factors to age of first sexual intercourse; 3) whether the number of completed hours or type of sexual education received, had a significant impact on sexual knowledge; and 4) whether there was a relationship between level of sexual knowledge and sexual behaviour. Eighty-three adolescents ($M = 17.76$ years) completed the questionnaire either in a sexual health clinic setting or online. Key demographic characteristics identified that 89% of the sample had ever had sexual intercourse ($M = 15.92$ years) and more than one third of the sample had experienced unwanted sexual intercourse (36.5%). Adolescents in this sample cited informal sources of sexual education most frequently, with friends (75.9%) the most commonly identified. The majority of the sample (45.7%) reported more than
15 hours of informal based sexual education over the past 12 months and approximately 5 hours of formal education was reported by more than half of the sample (58%). The results of the study showed that age of first oral sex was predictive of age of first sexual intercourse, accounting for 62% of the total variance. Results also showed that there was no statistically significant relationship between hours of sexual education or type of sexual education on sexual knowledge. There was also a statistically significant finding of sexual knowledge being predictive of more proactive sexual behaviour but this effect was small, accounting for only 6.25% of the variance. A second, qualitative study was undertaken in order to complement and enhance the quantitative findings, by expanding our understanding of adolescents’ experiences of: what sexual education they have access to, any barriers they face in accessing sexual education or sexual health information, and what they feel they need. Key themes were extracted using thematic analysis. These were: a desire/need for sexual education beginning at a young age; the importance of trustworthiness of the source of information; and adolescents’ perceptions of fear and embarrassment as barriers to accessing sexual health information or seeking help.

**Implications of Findings:** Collectively, the data suggested several key themes. The first is the importance of delaying first sexual contact, in order to delay an earlier age of sexual intercourse. The second is the growing importance of the trustworthiness and accuracy of the source of sexual education for adolescents as they are increasingly focused on accessing informal sources of sexual health information. There is also the potential need for an increased focus on improving salience, both in terms of the information being conveyed and when it is received.

**Conclusion:** These findings highlighted that the challenges of implementing effective sexual education and health promotion for adolescents have not reduced. Indeed, they may be increasing with adolescents’ greater resort to informal information sources of questionable accuracy (particularly online sources). It is suggested that a productive approach is likely to be one that focuses on addressing the way sexual education is provided: at the community level, by engaging with providers, such as doctors and healthcare workers, teachers and parents; and, on an individual level for young people themselves. This is to ensure that those who have the capacity to protect or improve the mental and physical wellbeing of adolescents, have the knowledge and skills to do so.
CHAPTER ONE: INTRODUCTION

Over the past decade there has been a focus on the sexual health of adolescents, particularly in larger Western countries, such as the United States (US) and the United Kingdom (UK), where rates of adolescent pregnancy and sexually transmitted infections (STIs) are among the highest in the developed world (Advocates for Youth, 2010; The World Bank, 2011). Research has highlighted a number of factors that place adolescents at an increased risk of poor decision making, including increased pleasure seeking, a smaller prefrontal cortex which decreases impulse control and can impact planning and organisation, excessive alcohol use, such as binge drinking, and peer and social pressures (Institute of Medicine (US) and National Research Council (US) Committee on the Science of Adolescence, 2011; Whaley, 2000). Risky sexual behaviours influenced by these factors put young people at an increased risk of unplanned pregnancy and contraction of STIs than in adulthood. In turn, these risky sexual behaviours can lead to the compromised health and wellbeing of adolescents (Whaley, 2000; World Health Organisation, 2012). The impacts are widespread and profound - financial, social, physical and psychological damage for the individual, as well as for the community (Department of Health and Ageing, 2010).

In Australia, the Commonwealth DoHA developed the Second National Sexually Transmissible Infections Strategy 2010-2013, which identified young people as a priority population. This strategy reported that, based on STI prevalence data, this group were at risk of: increasingly higher rates of STIs; earlier sexual debut than previous cohorts of young people; higher rates of partner change; limited health literacy and health skills; and more barriers to service access and use (DoHA, 2010). This strategy stated that, to prevent these risks, sexual education and sexual health promotion were needed. Yet, despite these concerns and stated objectives, almost seven years on from the DoHA’s report, sexual health is still not seen as a national health priority.

Given the importance of the health and wellbeing of adolescents, and their increased risk of experiencing negative outcomes, this thesis focuses on investigating the relationships between sexual education, sexual knowledge and sexual behaviour: areas that this field of research has highlighted as being influential to these potential outcomes. It provides a context: by exploring the statistics for, and impacts of, STIs and unplanned pregnancies for this population; and, by examining the most prominent forms
of sexual education, including a critical review of the current literature. This then provides a basis for determining the impact of sexual education on two main outcomes - knowledge and behaviour. This thesis also gives an updated look at the sexual education Australian adolescents are receiving and explores whether the source or hours of sexual education received are having an impact on sexual knowledge and behaviour.

1.1 Adolescents and Sexual Health

Given the significant physical, emotional, and financial impacts of risky sexual practices in adolescence, and the relative low priority given to this aspect of health education, further review of the literature is warranted. In order to understand the importance of this area, this section examines factors found to impact on the physical and psychological health of adolescents, specifically STIs and unplanned pregnancies. The author will define the key terms relevant to this topic, before outlining the prevalence rates and the potential impacts upon adolescents of both the infections that can occur and unplanned pregnancies. To contextualise this issue further, the author will draw on research from Australia, as well as other developed nations.

This thesis adopts definitions derived by the World Health Organisation for the classification of the key terms: adolescence (WHO, (see box 1.1) and sexual health (WHO, 2006) (see box 1.2).

Box 1.1: Definition of adolescence and adolescent development
[I]s the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to 19. It represents one of the critical transitions in the life span and is characterised by tremendous pace in growth and change. (para.1)

Box 1.2: Definition of sexual health
A state of physical, emotional, mental and social well-being in relation to sexuality. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled. (p.5).
1.1.1 *Bacterial sexually transmitted infections*

Bacterial STIs refer to infections such as chlamydia and gonorrhoea. These are the most prevalent infections among adolescent populations. The negative consequences of acquiring a STI range from problems with relationships, issues with self-esteem, and particularly risks to both the physical and sexual health of the adolescent. Chlamydia and gonorrhoea have similar characteristics. They are curable but, if left untreated, can: infect the cervix, uterus and pelvis in women; and the prostate, urethra and testes in men. Problematically, these infections are largely asymptomatic, so that adolescents are generally unaware they are infected and need treatment, thus increasing the likelihood of passing on these STIs through risky sexual practices such as unprotected sexual intercourse (Chinsembu, 2009).

If untreated, in females they can lead to problems such as pelvic inflammatory disease, which can result in ectopic pregnancies, chronic pelvic pain and infertility. In men, they can lead to inflammation in the upper genital tract and infertility. They also increase the chances of contracting other sexually transmissible infections such as human immunodeficiency virus (HIV) (Australian Bureau of Statistics [ABS], 2012).

Rates of adolescent bacterial STIs are considered to have reached epidemic proportions in a wide range of developed countries, with Australia demonstrating comparable rates of infections, despite a much smaller population. In Australia, infection rates of chlamydia and gonorrhoea are highest among adolescents and have increased significantly over time. In 2011, rates of reported new infections of chlamydia were highest for adolescents aged 15 to 19 years. Although the overall rates of chlamydia have tripled in the last decade for both men and women, the 15-19 year age group has shown the greatest increase in rates between 2001 and 2011 (ABS, 2012). Similarly, the 15-19 year age group has one of the highest rates of notification of infection of gonorrhoea, particularly for females, with a rate of 178 per 100,000, compared to 134 per 100,000 for males. In contrast, within every other age group the rate of gonorrhoea notifications for males was higher than for females (ABS, 2012).

Rates of adolescent bacterial STIs are considered to have reached epidemic proportions in a wide range of developed countries:
• US – in 2016, the rate of reported cases of chlamydia for adolescents 15-19 years of age, was 1,929.2 per 100,000, and between 2014-2016, for the same age group, there was a 4.1% increase in infection rates of chlamydia for females and 15.3% for males (Centers for Disease Control and Prevention [CDCP], 2017).

• England - between 2009 and 2011, the 15-19 year age group accounted for almost 25% of all new reported cases of STIs (Public Health England, 2012).

• Canada - in 2015, adolescents between 15 and 19 years of age had the second highest infection rate for chlamydia at 1,132.1 per 100,000, and this was similar for rates of gonorrhoea (113.4 cases per 100,000) (Choudhri, Miller, Sandhu, Leon & Aho, 2018).

• New Zealand - the 15-19 year age group for females had the highest infection rate for cases of chlamydia (The Institute of Environmental Science and Research Ltd., 2011).

1.1.2 Lifelong sexually transmitted infections

Lifelong sexually transmitted infections include the herpes simplex virus (HSV) that causes genital herpes and cold sores. There are two types of HSV: HSV-1 is typically associated with oral infection; and HSV-2 with genital infection. While both viruses can cause genital herpes, HSV-2 is the primary cause. It is spread through skin to skin contact and, as with other STIs, an infected person can be asymptomatic. Once infected, a person carries the virus for life, and recurrent outbreaks or infections may occur. An outbreak of herpes results in painful blisters and lesions and an individual with genital herpes may experience recurrent painful genital sores (Looker, Margaret, Turner, Vickerman, Gottlieb & Newman, 2015).

Herpes is more severe in those with suppressed immune systems. Having herpes can increase the susceptibility of contracting HIV and can increase infectiousness in those with HIV. Antiviral medication may shorten outbreaks but there is no curative treatment for either genital or oral herpes. The fact that there is no cure for herpes, unlike other STIs that can be treated with antibiotics. This has led to considerable social stigma regarding the virus. This often results in considerable psychological distress for those with HSV, particularly HSV-2 (genital) (ABS, 2012).
As herpes is not a notifiable infection, accurate prevalence data are not readily available. A Melbourne study, examining the changing epidemiology of genital HSV, found there was a substantial increase in genital herpes infections caused by HSV-1 between 1980 (15.8%) and 2003 (34.9%), and that this increase was proportionately greater for males (7.7% to 28.8%) compared to females (24.7% to 39.4%). The study also found that, although the rates of genital HSV-1 increased across all age groups, in 2003 the highest rates of diagnosis were for people younger than 20 years of age. It should be noted, however, that higher numbers of females sought treatment compared to males, possibly due to symptomatic factors, and therefore the rates for males may be underreported. Transmission is easier from males to females, which may also explain the higher rates for females (Tran, Druce, Kelly, & Birch, 2004). Additionally, HSV-1 has increasingly been found to be the cause of genital infections (HSV-2), and it is suggested that this reflects an increase in oral sex practices among young people, as well as multiple sexual partners (Kang, Skinner, & Foran, 2007; Smith, Agius, Mitchell, Barrett, & Pitts, 2009; Tran et al., 2004). These findings highlight a key area where sexual education may be effective in teaching adolescents that cold sores (HSV-1) can lead to genital herpes (HSV-2) through risky sexual practices such as oral sex.

1.1.3 Blood borne sexually transmitted infections

Blood borne viruses include Hepatitis C and HIV. These are viral STIs for which there is no cure and, if left untreated or undetected, these infections may lead to serious negative health consequences. Hepatitis C is transmitted through exposure to infected blood or other bodily fluids containing blood, as may occur in unprotected sex, and can cause chronic liver damage and liver cancer. There is no vaccination for Hepatitis C (ABS, 2012), however, in early 2016 treatment options became available that have proven to be more than 90% effective in treating and curing Hepatitis C (Hepatitis C Virus Infection Consensus Statement Working Group, 2017).

HIV is a chronic retrovirus that suppresses the immune system, enabling the onset of other life-threatening infections. If left untreated HIV can lead to the development of acquired immunodeficiency syndrome (AIDS). This leaves the body open to further opportunistic infection and disease. It can be spread through unprotected sex, from mother to baby through pregnancy, childbirth and breastfeeding, and through sharing needles. There is no cure but anti-retroviral drugs may slow the progression from HIV
to AIDS. Many people with HIV, however, remain asymptomatic until the virus has progressed to AIDS (ABS, 2012).

In Australia, in 2008, Hepatitis C was the most commonly reported, newly diagnosed hepatitis virus among young people aged 12-24, with a rate of 36 per 100,000. In addition to these reported rates, a recent national survey of secondary school students found that, similarly to the 2002 sample, the majority of students incorrectly believed there was a vaccination for Hepatitis C (89%) (Smith et al., 2009). In regard to HIV, the prevalence rate of this infection in Australia is low in comparison to other countries but has shown a marked increase in people aged 12-24 years. The rate of HIV in 2008 was 3.1 per 100,000, a 47 per cent increase since 1998 (2.1 per 100,000) (Australian Institute of Health and Welfare, 2011).

1.1.4 Other infections

In Australia, another virus that is commonly transmitted sexually but through skin based contact is the human papilloma virus (HPV). Once contracted, HPV is generally lifelong in nature and is a common cause of cervical cancer in females, and persistent infection can cause penile and anal cancers in males. As people are often asymptomatic, the first indication of having HPV in females may be via an abnormal PAP screen (National Centre for Immunisation and Research and Surveillance [NCIRS], 2016). Beginning in 2007, female adolescents in Australia received a government funded vaccine (Gardasil) for HPV, an initiative which continues today for both males and females (NCIRS). Of the more than 70 types of HPV that specifically affect the genitals, the Gardasil vaccine only protects against two high-risk types of HPV (16 and 18 – the most common causes of cancers associated with HPV). In late 2017, a second vaccine was introduced (Gardasil 9), which covers an additional 5 high-risk HPV types and has the potential to prevent approximately 90% of genital-related cancers (Brotheroton, 2018).

In summary, adolescents are at a higher risk for contracting STIs than adults, particularly in the 15-19 year age group. Though many of these STIs are treatable, a lack of awareness, fear or asymptomatic presentations means treatment may not be sought or received, increasing the risk of long term, negative health outcomes as well as social stigma. For the aforementioned reasons, rates of adolescent STIs in Australia are high and potentially underreported, (particularly for HSV, which is not a notifiable
infection.) Moreover, not all STIs are curable or have a known vaccine, may have more than one strain, and be transmissible purely through skin contact, such as HSV and HPV. These findings highlight an ongoing problem for a population already noted as a ‘priority’ by the Department of Health and Aging (DoHA). Given the DoHA’s 2010 report citing issues such as poorer health literacy, barriers to access and the need for sexual education among adolescents, particularly as a key method of prevention, this thesis focuses on addressing these factors. It covers the sexual education adolescents have access to and are accessing, how much they are accessing, and the barriers that prevent adolescents from accessing what they perceive they need.

1.1.5 Pregnancy

Within the field of sexual health and sexual education research there has been a strong focus on adolescent pregnancy. This is associated with a range of negative physical and psychosocial outcomes throughout pregnancy, and during and after birth, for both mother and child. This section discusses these physical and psychosocial outcomes.

Social disadvantage has been identified as an important determining factor in the poor health outcomes associated with adolescent pregnancy. Lower socioeconomic status is frequently associated with poorer access to quality education, poor employment prospects and inadequate family support. As a result, adolescents may be less likely to seek out adequate postnatal care (AIHW, 2011; WHQW, 2011).

Adolescent mothers often delay confirmation of their pregnancy, reflecting factors such as denial of the possibility of pregnancy, fear of the pregnancy itself, and lack of awareness of their normal menstrual cycle. This delay can potentially lead to poorer antenatal care (Committee on Adolescence & Committee on Early Childhood and Adoption and Dependent Care [CACECADC], 2001; Dopkins Broecker & Hillard, 2009).

As younger adolescent mothers often do not have a fully developed pelvis, there is a higher risk of complications during pregnancy and childbirth. These include pregnancy induced hypertension, low infant birth-weight and premature births, all potentially leading to the need for neonatal intensive care (Women's Health Queensland Wide [WHQW], 2011).
Adolescents also tend to have poorer eating habits, engage in dieting behaviours, and have been shown to continue to smoke and consume alcohol both during and after pregnancy. These behaviours can lead to lower maternal weight gain and the pregnant adolescents lacking vital nutrients, such as folate, needed for appropriate development of the child (AIHW, 2011; WHQW, 2011).

In 2011, in developed, westernised countries, the number of births to adolescent girls aged between 15 and 19 years, was equal highest in both the US and the UK, with a rate of 30 per 1000 births. This was followed by New Zealand with a rate of 21 (The World Bank, 2011). Countries with a similar westernised background but without English as their primary language, such as Germany, France, Sweden and Switzerland, showed much lower adolescent births rates (6, 6, 6 and 4 respectively).

During this same period, Australia’s rate of births in this age group was 13 per 1000 births. Though half that of the US and UK, this rate is two to three times higher than the lowest rates seen in European countries, placing Australia’s rate of adolescent births as the fourth highest in the industrialised world. Table 1.1 demonstrates the changes in these figures, between 2011 and 2013, highlighting a reduction in the adolescent birth rates for both the UK (30 to 19.3) and the US (30 to 26.6). New Zealand’s birth rate also dropped, albeit more marginally. In contrast, Australia’s adolescent birth rate increased, from 13 per 1000, to 14.2 per 1000 (The World Bank, 2011; WHO, 2016). Given the negative health outcomes associated with adolescent pregnancies, the low rates that have been maintained, or further reduced, in the European countries suggest substantial scope for improving the health outcomes for Australian adolescent females by addressing this issue in a more structured way.
Table 1.1

Adolescent birth rates (15-19 years of age) across developed countries for 2011 and 2013.

<table>
<thead>
<tr>
<th>Country</th>
<th>2011</th>
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<tbody>
<tr>
<td>United Kingdom</td>
<td>30</td>
<td>19.3&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>United States</td>
<td>30</td>
<td>26.6</td>
</tr>
<tr>
<td>New Zealand</td>
<td>21</td>
<td>19.1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Australia</strong></td>
<td><strong>13</strong></td>
<td><strong>14.2</strong></td>
</tr>
<tr>
<td>Poland</td>
<td>13</td>
<td>14&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Canada</td>
<td>12</td>
<td>NA</td>
</tr>
<tr>
<td>Austria</td>
<td>11</td>
<td>7.9</td>
</tr>
<tr>
<td>Ireland</td>
<td>11</td>
<td>9.2</td>
</tr>
<tr>
<td>Spain</td>
<td>11</td>
<td>8.4</td>
</tr>
<tr>
<td>Finland</td>
<td>9</td>
<td>7.3</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>9</td>
<td>6.4&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Norway</td>
<td>8</td>
<td>5&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Germany</td>
<td>7</td>
<td>7.8&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>France</td>
<td>6</td>
<td>6.2</td>
</tr>
<tr>
<td>Sweden</td>
<td>6</td>
<td>5.1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Denmark</td>
<td>5</td>
<td>2.4&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Italy</td>
<td>5</td>
<td>5.8</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4</td>
<td>4.5&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Switzerland</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

<sup>a</sup> = 2012; <sup>b</sup> = 2014

Thus far, adolescent birth rates have been reviewed. These data, however, do not represent the true scope of adolescent pregnancies since these may result in outcomes aside from live births. Common alternatives include termination of an unplanned adolescent pregnancy or miscarriage. Unfortunately, termination data are not routinely collected making it is difficult to determine the proportion of adolescents choosing this option. The prevalence of miscarriage among adolescents is also difficult to determine. There is evidence, however, to suggest that, for adolescents less than 18 years of age, the risk of foetal loss from spontaneous abortion (or miscarriage), ectopic pregnancy and stillbirth, is similar to that of women 35 years of age (Anderson, Wohlfahrt, Christens, Olsen & Melbye, 2000). This means that the rates of unplanned pregnancies
for adolescents may be greater than reported, due to pregnancies resulting in a miscarriage, or other foetal loss, rather than a planned termination. Thus, the currently available data are likely to understate the scale of the problem as overall figures of unplanned pregnancies are likely to be underreported. Furthermore, unplanned or unintended pregnancies may present the adolescent with a greater likelihood of the aforementioned issues. Highlighting the importance of education for adolescents to make informed choices in managing a pregnancy whether it is planned, or unintended.

Australian research indicates that the high rates of adolescent pregnancy are associated with risky sexual behaviours, such as unprotected sexual intercourse, not using effective contraception and having multiple sexual partners (Bowden, O'Keefe, Primrose, & Currie, 2005; Mitchell, Patrick, Heywood, Blackman & Pitts, 2014; Smith et al., 2009). A national survey of Australian secondary school students found an upward trend in the rates of risky sexual practices of female adolescents who reported having already had sex, between cohorts in 2002 and 2008, these findings are displayed in Table 1.2.

Table 1.2
*Trends in sexual behaviours of Australian female adolescents in Years 10 and 12 between cohorts in 2002 and 2008.*

<table>
<thead>
<tr>
<th>Sexual behaviours</th>
<th>2002 Cohort</th>
<th>2008 Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>No sex in previous year (%)</td>
<td>3.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Sex with more than 3 people in previous year (%)</td>
<td>17.3</td>
<td>26.5</td>
</tr>
</tbody>
</table>

These findings indicate that between 2002 and 2008 there was a decrease in the number of females who did not have sex in the previous year, as well as an increase in the number of females who had sex with more than three people in the previous year. This study also found a slight increase in Year 10 females who reported having sex that resulted in a pregnancy (Smith et al., 2009). In addition, in examining the results of the most recent study in this series, there was a slight increase in the total number of sexually active students reporting sex that resulted in a pregnancy, between 2008 and 2013 (4.6% and 5%, respectively) (Mitchell, Patrick, Heywood, Blackman & Pitts, 2014).
Similarly, Bowden et al. (2005) found that whilst more than half of a group of surveyed high school students reported always using contraception (66.8%), there remained a large number who reported only sometimes using contraception (22.4%), or very rarely/never using contraception (8.3%). Additionally, less than half of the sample reported always using a condom (47.8%), followed by sometimes (42.1%) and never (7.1%). These findings highlight that, while the high fertility rate in adolescence may contribute to an increased likelihood of pregnancy, sexual risk-taking behaviour may play a key role in unplanned pregnancy in adolescents.

In summary, adolescent pregnancy can carry with it a number of risks, including poorer health outcomes for both mother and child, as well as a number of negative psychosocial outcomes. Rates of adolescent pregnancy in Australia are considered high, even when compared to global figures. This highlights the importance of knowledge and education, given that pregnancy in adolescence is largely preventable through various forms of contraception.

1.2 Sexual Education
This next section outlines and examines specific sources of sexual education available to adolescents and the comparative trends between Australia and countries such as the US and the UK, in order to establish the current scope of available sexual education. A review of every possible form of sexual education is beyond the scope of this work. The sources examined within this thesis were chosen as they were the most commonly cited within the literature. They include: school based sexual education; primary healthcare; government initiatives; family networks and friends or peers; and other informal sources. This thesis focuses on the perceptions of the efficacy of the sources of sexual education received by, and available to, adolescents in order to determine their effectiveness.

It must be noted that, throughout the literature, the terms sexual education and sexuality education are used interchangeably. For the purpose of this thesis, we use the definition of sexual education developed by the United Nations Educational Scientific and Cultural Organization (2011) (see box 1.3).
1.2.1 School based sexual education

The form and coverage of school based sexual education varies globally. A key point of difference between Australia and countries, such as the US, is the prevalence of abstinence-only over comprehensive sexual education (Goodson & Walsh-Buhi, 2011; Ott & Santelli, 2007a; Santelli et al., 2017). Compared to Australia, the use of abstinence-only sexual education is far greater in the US, as too are their rates of unplanned pregnancies and STIs in adolescents (ABS, 2012; CDCP, 2011, 2017). There has, and continues to be, significant controversy over the use of abstinence-only education. It is argued that this model does not allow adolescents to be fully informed and aware of the methods and means of protective factors such as contraception, and knowledge of STIs, thus increasing their risk of these outcomes (Walsh-Buhi, Maness & Mahony (2016). Rather than highlighting abstinence as an option based on personal choice (in conjunction with comprehensive sexual education), it relies heavily on the essentially moral message that abstaining from sex is the right thing to do (Bruess & Schroeder, 2013; Santelli et al.).

Another fundamental problem with abstinence based programs is their low efficacy. As noted in the previous section, many adolescents do not abstain from sex and hence the content of abstinence programs offers no guide to safe sexual practices. Studies have also indicated concerns around the medical accuracy and the appropriateness of sexual health information provided in abstinence and abstinence-only education in the US (Ahern & Kiehl, 2006; Ott & Santelli, 2007b; Santelli et al., 2017). In their review, Ott and Santelli (2007a) examined several federally funded abstinence based programs, and found that the medical accuracy of facts pertaining to STIs and pregnancy was compromised by withholding and distorting such health information. Additionally, they identified ethical concerns relating to abstinence-only polices for sexual education for adolescents because abstinence-only programs are not required to disclose information

Box 1.3: Definition of sexual education

An age-appropriate, culturally relevant approach to teaching about sex and relationships by providing scientifically accurate, realistic, non-judgmental information. [sexual education] provides opportunities to explore one’s own values and attitudes and to build decision-making, communication and risk reduction skills about many aspects of sexuality. (p.8).
on contraception and other facets of human sexuality, except to highlight their rates of failure. Ten years later, the Society of Adolescent Health and Medicine [SAHM] undertook an updated review of US abstinence only policies and programs. Based on their review, the SAHM highlight a number of key points. Namely that the scientific evidence against the use of abstinence only sexual education has grown significantly, and that the abstinence only until marriage programs being promoted by the US government “…are ethically-flawed, are not evidence-based, and interfere with fundamental human rights to complete and accurate health information.” (Santelli et al., 2017, p. 401).

The delivery of sexual education to adolescents is a notable problem in other countries, such as the UK, which mirror, to a larger extent, those experienced in Australia. Thus, in Australia, formal school taught sexual education involves a comprehensive model, based around sexual education starting early in adolescence and continuing on through high school (Bruess & Schroeder, 2013; Giordano & Ross, 2012). Like the UK, however, individual schools can choose the level of detailed implementation of sexual education, thus the quality and amount of education they receive is entirely dependent upon the school and the teachers delivering the program.

The comprehensive model of sexual education includes a discussion about the option of not having sex as the best prevention of pregnancy and STIs, as well as teaching about the effectiveness of condom and contraceptive use and interpersonal and communication skills (Bruess & Schroeder, 2013). In 2012, a national survey of young people aged between 15 and 29 years of age was conducted by the Australian Youth Affairs Commission (AYAC) and the Youth Empowerment Against HIV/AIDS (YEAH) (Giordano & Ross, 2012) with the aim of determining what students wanted out of sexual education and where it was lacking. Results from this survey indicated that young people unanimously agreed on a number of things, in particular that sex education taught in schools should be the same across the nation. It also showed that, while more than half of the sample (67%) identified school as an available source of sexual education information, the majority favoured informal sources such as the internet, friends and magazines. The majority of respondents were between the ages of 18 and 24, meaning that adolescents below this age group were somewhat underrepresented.
The importance of these findings is highlighted by those of a national survey of teachers regarding sexual education in Australia. This survey found that the majority of sexual education topics were taught in Years 9 and 10, with topics covered in years 7 and 8 relating to puberty, reproduction and body image. In Years 11 and 12 almost no sexual education was provided. This reality is in contrast with findings of the AYAC/YEAH survey where the majority of respondents indicated that sexual education should be taught across all year levels. The most used teaching resources were websites and DVDs, and fewer than half of teachers reported using state curriculum packages (38.7%). More than half of teachers listed topics not being part of the curriculum and time constraints as their main barriers to teaching sexual education. Again, in comparison to the youth survey, one of the topics not covered by half of teachers was the pleasures of sexual behaviour, a topic that more than 70% of youth wanted to learn in sexual education classes (Smith et al., 2011).

The available evidence suggests that the current school based approach in Australia does not provide an adequate or effective source of information for adolescents about sexual health, primarily because it does not accurately reflect the needs of adolescents in relation to learning about sexual health. While there is evidence to suggest that teachers are using resources that are more in keeping with adolescents’ sources (e.g. websites and DVDs), the lack of use of state curriculum packages highlights that Australia is still lacking the national school-based curriculum for sexual education that would more effectively fill this need. This highlights that further investigation is warranted to determine some of the important factors required for school-based sexual education, in order to address the needs of adolescents.

1.2.2 Primary healthcare and health services

Primary healthcare refers to the first level of contact an individual has with the healthcare system. It includes General Practitioners (GPs), nurses and allied health practitioners. Other primary health services may include family planning and sexual health clinics. In Australia, the healthcare model relies heavily on the primary healthcare setting.

In Australia there are no nationally accepted guidelines for overall adolescent healthcare except in relation to diet, obesity and diabetes (Skinner & Hickey, 2003). The guidelines in the Standards for the Care of Children and Adolescents in Health Services
(Royal Australian College of Physicians, 2008) are mainly targeted towards providing separate facilities across areas of health services where children and adolescents are treated, rather than the implementation of preventive or screening measures within primary healthcare settings.

By comparison, the US established guidelines for the provision of preventative healthcare for adolescents by primary care providers in 1994, and an updated version of the recommended interventions for 11 to 24 year olds was published by the US Preventive Services taskforce in 1996 (Montalto, 1998). There are twenty five recommendations for adolescent healthcare and five of these are specifically related to sexual healthcare, targeting prevention and screening of STIs and pregnancy, as well as providing sexual education.

Similarly, in 2003 the UK Royal College of Paediatrics and Child Health identified the need for tailored services for adolescent health and put together a report addressing these needs, with recommendations across both primary and secondary health care services. These recommendations covered sexual healthcare along with other aspects of physical and mental health (Royal College of Paediatrics and Child Health, 2003).

The implications of these findings are that, for Australian adolescents, the sexual education they receive in the primary healthcare setting is reliant on the individual practitioner they see at that time. This is particularly relevant as it has been found that GPs perceive problems in communicating with adolescents, as well feeling particularly uncomfortable discussing sexual histories with young people (Kang et al., 2007). In Australia, in the absence of specific guidelines, the sexual education, screening and preventive measures provided by those in primary healthcare or other health services may or may not be governed by appropriate evidence in respect to effective education for this age group.

1.2.3 Government initiatives

Federal Government initiatives involve projects that address an issue at a national level. This also forms the basis for individual states to implement sexual education in the form of promotions and prevention campaigns and strategies, which are in line with the national approach.
In 2009, the Commonwealth Department of Health and Ageing (DoHA) launched a national campaign targeting the growing rates of STIs among young people aged 15-29. This campaign utilised advertising in magazines, on the radio, as well as online and outdoor advertising. It provided information about the transmission, symptoms, treatment and prevention of STIs (DoHA, 2009).

Individual Australian states and territories have similar sexual health promotion campaigns, the majority of which target STIs. The effectiveness of these campaigns is difficult to measure as it has been observed that the number of newly reported notifications have increased, for example, chlamydia. This may, however, indicate either an increase in new infections, or a rise in people getting tested for STIs (The Kirby Institute, 2012). In addition to these promotional and preventative campaigns, Australia has the National Sexually Transmissible Infections Strategy. As mentioned previously, this strategy identifies young people as a high risk population for the burden of STIs within Australia (DoHA, 2010).

Internationally, some countries, like the UK, have similar government initiatives for addressing the sexual health of adolescents. One key difference between overseas initiatives and those of Australia is the specific targeting of adolescent pregnancy. As an illustration, the UK has the Teenage Pregnancy Strategy, which was first implemented in 1999. The UK’s National Sexual Health and HIV Strategy was updated in March 2013, when the Department of Health released a report detailing a framework for the improvement of sexual health in England (Department of Health (UK), 2013). The UK report identified young people as a priority in relation to high rates of STIs and had a strong emphasis on the prevention of adolescent pregnancy. Additionally, the UK’s National Health Service developed Sex. Worth Talking About, a national awareness program targeting adolescent sexual health by promoting communication about contraception, STIs and STI testing and talking about sex (The National Health Service (UK), 2009).

These findings suggest that there is little difference in the strategies and initiatives of governments in countries similar to Australia but that, as mentioned above, measurement of the effectiveness of these initiatives is difficult due to differences in reporting of STIs. Evidence also suggests that government strategies place an emphasis
on quality of sexual education for adolescents, yet there continues to be a large gap between the objectives of these strategies and their practical implementation.

1.2.4 Family networks, friends and/or peers

In Europe, the framework for Standards of Sexuality Education identifies the importance of both formal and informal sources of sexual education for children, adolescents and young people (Federal Centre for Health Education, 2010). This framework highlights the fact that, at a younger age, reliance on parents as a source of sexual information is particularly important. Indeed, parents and siblings have been identified as highly influential in the sexual education and decision-making of adolescents with regards to sex (Giordano & Ross, 2012; Sprecher, Harris, & Meyers, 2008). Friends and peers have also been recognised as key influences in terms of adolescents’ knowledge, attitudes and sexual behaviour.

Findings from the US indicate that, over the last 17 years, there has been a shift towards sources of education favoured by adolescents i.e. their peers as a key source of sexual information. In their study, Sprecher et al. (2008) examined data collected across several cohorts of young people between 1990 and 2006. It was shown that, over the 17 year period, there was a substantial increase in young people receiving much of their information from peers. Parents also remained a stable source of information over the same time period. These findings suggest that, though the importance of their peers as a source of information has increased, parents are still considered a valuable source of sexual information for young people.

In Australia, trends in sources of informal sexual education appear to be fairly similar, with the national survey of young people (Giordano & Ross, 2012) showing that the majority of the sample had most commonly experienced sexual education from friends (76%), followed by parents (65%), and siblings (46%). In relation to how the sample felt that sources of information regarding sexual health should be delivered outside school, a large percentage of the sample selected a youth peer education program (77%), home/family networks (66%), and friends (59%). This evidence implies that, in order to address most effectively the problems associated with uninformed and risky adolescent sexual behaviour, education programs should be strongly oriented around peer networks.
1.2.5 Other Informal Sources

Other informal sources of sexual education in relation to adolescent sexual behaviour include the internet and media, for example, television and magazines, as well as sources such as pornography that appear to be increasing in popularity. Sprecher et al. (2008) for example, found that between 1990 and 2006 there was a significant increase in the importance of media as a source of sexual health information for young people. This trend is likely to continue given the increase in access to the internet and greater levels of advertising in both print and online. In Australia, the 2012 national survey conducted by YEAH/AYAC showed that the most common sources of sexual education outside of formal or other informal settings, such as parents and friends, were the internet (85%), magazines (72%), television and movies (67%) and pornography (64%). This survey also found that, outside of formal sexual education, almost 90% of the sample said their most preferred access to sources of sexual health information was educational websites/online information.

The above findings suggest that, despite the informal nature of media based sources of sexual health information, adolescents and young people actively seek out and want these sources to be available to them. These findings also indicate that access to these sources is increasing over time, highlighting both the need and the opportunity to utilise these sources to reach a wider audience for sexual health education and promotion in the adolescent population.

1.3 Chapter Summary

Thus far, this chapter has highlighted the disconnect between the importance placed on the sexual health and wellbeing of adolescents in Australia and the actual outcomes they are faced with. Specifically, it was noted that statistically, little or no positive change has occurred in terms of pregnancy and STI rates among adolescents, despite announced measures to reduce such burdens. Both teachers and students have also highlighted a lack of consistency concerning what is actually taught and how it is taught as part of sexual education in schools.

It also noted a considerable shift in the sources of sexual education being utilised by adolescents, towards those that are informal, especially technology, as well as friends/family. Over time, the importance of sources of sexual education for adolescents has changed toward those resources that are more accessible and salient, such as the
media, the internet and friends or peers. Young people appeared to be dissatisfied with the quality of formal sexual education, and indicated that sexual education in schools does not address all of the appropriate topics and that it is poorly delivered. Studies examining the impact of sexual education highlight important gaps in the research, in particular the lack of recent research investigating the overall effectiveness of sexual education, based on factors such as the type of sexual education (i.e. formal or informal) and amount (i.e. number of hours), as opposed to the evaluation of individual programs. Finally, despite knowledge and attitudes having been highlighted as playing a key role in changing risky sexual practices amongst adolescents (Giordano & Ross, 2012), evidence of the effects of sexual education on sexual knowledge and behaviour is inconsistent and must be addressed more systematically (Agius, Pitts, Smith, & Mitchell, 2010; Kirby, Laris, & Rolleri, 2007; Oakley et al., 1995).

This overview provides the premise for Chapter Two, a critical review of the literature, examining the use of sexual education intervention and prevention programs and their impact, if any, on adolescent sexual behaviour and knowledge. This review of evidence highlights that sexual education for this population has been poorly addressed, and the effectiveness of different interventions and strategies has been poorly monitored. Specifically, adolescents are continuing to engage in unsafe sexual practices such as inconsistent use of condoms and other contraceptive methods, younger age at first intercourse and more sexual partners (Agius, Dyson, Pitts, Mitchell, & Smith, 2006).

Chapter Three provides a rationale for the methodological approach selected for this thesis and define the methods used. Choosing an appropriate methodology requires a careful consideration of a number of factors, including past research, research questions, and the lens with which the research is being viewed. The approach taken within this thesis is a mixed-methods approach: using a questionnaire in the initial study, followed by open-ended questions in the second study. This allows the utilisation of the richness of detailed, written responses, so as to expand upon and possibly fill any gaps from data obtained from the quantitative study.

Chapter Four examines a range of health focused theoretical frameworks as they relate to sexual health behaviour. The results of Chapter Two highlight an important gap in regard to the use of theory or theoretical models as a basis for the sexual education approaches or programs used. As such, it provides context for this thesis by exploring
key elements of behaviours of the period of adolescence regarding risk. The chapter then explores some of the theoretical frameworks used in the sexual health research field, before providing an overview of the theoretical frameworks commonly used within health behaviour and education more generally, thus providing a rationale for the use of the chosen theoretical framework for this study.

Chapter Five presents the first of the two research studies included in this thesis. Study One is quantitative in nature and utilises a questionnaire format to determine a range of information from adolescents attending a clinic for sexual health and/or family planning needs. This study uses statistical analyses to test hypotheses based on the research questions posed by this thesis. Results of these analyses are examined and the implications of the findings discussed.

Chapter Six presents the second of the two research studies. Study Two is qualitative in nature, utilising open-ended questions that were developed to elaborate on the findings of Study One. This study investigates adolescents’ experiences and beliefs regarding a range of aspects of sexual education, including different sources of sexual education, the accessibility and barriers to accessing sexual education and sexual health information, and what is missing from sexual education. This study then uses thematic analysis to draw out key themes from participants’ responses. These themes are summarised and the implications of the findings discussed.

Chapter Seven, the final chapter in this thesis, provides conclusions from the integration of the findings of the studies. It also discusses the implication of these findings, as well as addressing the challenges of this research. Finally, it provides recommendations for future research.
CHAPTER TWO: LITERATURE REVIEW

This chapter presents a review of the literature on adolescent-based sexual education. Specifically, it provides a critical examination of the effectiveness of the sexual education methods currently delivered to adolescents and the relationship between sexual education and adolescents’ sexual attitudes, knowledge and behaviours.

2.1 Method

This review sought to identify all studies with a focus on adolescent sexual attitudes, knowledge and behaviour in relation to sexual education. The inclusion and exclusion criteria are shown in Table 2.1.

Table 2.1

Inclusion and exclusion criteria of review

<table>
<thead>
<tr>
<th>Included</th>
<th>Excluded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies with Sexual education focus:</td>
<td>- Studies with no assessment of sexual education</td>
</tr>
<tr>
<td>- Primary and secondary schools, sexual health clinics, family, peers</td>
<td>- Studies with no measure of sexual education</td>
</tr>
<tr>
<td>- Studies focusing on sexual education programs/interventions</td>
<td>- Studies focusing on parental views of sexual education</td>
</tr>
<tr>
<td>- Studies evaluating the effectiveness of programs/interventions</td>
<td>- Studies focusing on the training of teachers or other educators</td>
</tr>
<tr>
<td></td>
<td>- Studies focusing on pornography</td>
</tr>
<tr>
<td></td>
<td>- Studies focusing on school poverty as main factor</td>
</tr>
<tr>
<td></td>
<td>- Background information/expert opinion</td>
</tr>
<tr>
<td></td>
<td>- Studies with no clear evaluation process of programs/interventions</td>
</tr>
<tr>
<td>Studies focusing on sexual:</td>
<td>- Studies focusing on sexual desire</td>
</tr>
<tr>
<td>- Attitudes</td>
<td></td>
</tr>
<tr>
<td>- Knowledge</td>
<td></td>
</tr>
<tr>
<td>- behaviours</td>
<td></td>
</tr>
<tr>
<td>Adolescents</td>
<td>- Studies looking at university or college students</td>
</tr>
<tr>
<td></td>
<td>- Studies on military populations</td>
</tr>
<tr>
<td></td>
<td>- Studies looking at adults</td>
</tr>
<tr>
<td>Heterosexual focus</td>
<td>- Studies focusing on Gay, Lesbian, Bisexual or Transgender groups</td>
</tr>
<tr>
<td>Published in 2003 or later</td>
<td>- Published prior to 2003</td>
</tr>
<tr>
<td></td>
<td>- Studies examining data sets prior to 2003</td>
</tr>
<tr>
<td>Published in the English language</td>
<td>- Not published in English</td>
</tr>
<tr>
<td>Peer reviewed</td>
<td>- Not peer reviewed</td>
</tr>
<tr>
<td>Studies undertaken within Westernised, developed countries i.e. Australia, UK, US</td>
<td>- Studies in non-Western countries</td>
</tr>
<tr>
<td></td>
<td>- Studies in developing countries</td>
</tr>
</tbody>
</table>
The search utilised the databases PsycInfo, Medline Complete, Academic Search Complete and Proquest. The initial timeframe for the search was limited to articles published between January 1993 and May 2013, however, upon completion of the initial search, the timeframe was narrowed to include only articles published in the last ten years. This decision was made in light of the considerable change in the way education and sexual education are accessed, i.e. the increased access and reliance on social and communication-based media and peers and the shift away from parents as a key provider of education. This decision was also based on finding that, in this area of research, much of the literature over the last twenty years focused on non-Western, developing countries. Given the non-comparative nature of these studies with westernised, developed countries, these studies were removed. Additionally, due to the extensive amount of literature produced from this search, and the richness of data obtained, we decided to focus only on published and peer reviewed studies. This is in line with the National Health and Medical Research Council (NHMRC) evidence hierarchy, which considers studies and reviews as more robust than anecdotal or background information. This review was conducted based on the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines (Moher et al., 2009). Methodological quality of studies was assessed based on the aforementioned NHMRC guidelines for evidence hierarchy, specifically, designations of ‘levels of evidence’ according to type of research question. A table summarising each of the included studies has been provided (see Appendix A).

Individual searches of the key terms of sexual education, adolescents and their sexual attitudes, knowledge and behaviours were conducted and shown in Figure 2.1. To ensure all variations of these were examined, the following terms were used with truncation:
#1 “sex* education”  
#2 "Family Life Education"  
#3 "Parent Training”  
#4 "Safe Sex"  
#5 "Health Knowledge"  

#1 adolescen*  
#2 “young people”  
#3 youth*  
#4 teen*  
#5 “young adult*”  

#1 “sex* behavi*”  
#2 "sex* attitude*”  
#3 "sex* knowledge"  
#4 "sex* belief*”  
#5 "sex* values”  
#6 "sex* practice*”  
#7 "sex* activit*”  
#8 "sex* risk”

**Figure 2.1** Key search terms used in database search

The additional terms used for sex education were found to be too broad, thus the final search was limited to sex education only. The key term sex education was combined with all of the keywords for adolescents, as well as the terms for the three key factors (i.e. attitudes, knowledge and behaviour). The results for each database were pooled in an endnote library and reviewed via a title and abstract search. Articles considered potentially relevant were read in full to determine whether they met the eligibility criteria for inclusion in the study.

### 2.2 Results

The initial search revealed 1433 records. After the removal of duplicates, articles were screened via title review, with 987 selected for abstract review, and 89 studies were selected for full text review. Of these, 55 studies were considered to meet the inclusion criteria. The process of the literature review is depicted in Figure 2.2.
Each of the studies included in the review was examined in order to ascertain which of the three key factors were investigated by the study (see Appendix A for summary table). The key findings and patterns identified within the literature in relation to sexual education, and each of the three factors, are examined below in the discussion.

2.3 Discussion
This discussion examines four key areas addressed within the systematic review. The key findings and themes for the effectiveness of methods of sexual education and the impact of sexual education on sexual attitudes, knowledge and behaviour are addressed below. For the purpose of this discussion, STI and STD are used interchangeably due to the differences in terms used between papers.
2.3.1 Effectiveness of methods of sexual education

This section provides an examination of the literature pertaining to sexual education programs within four of the five forums discussed in the introduction. Findings were derived from school-based, primary care, family networks, friends or peers and other informal sources. This section highlights the five key determinants associated with the effectiveness of these methods i.e. training of facilitators, context of delivery, duration of intervention, time between pre-and post-test and ethnicity/cultural sensitivity. Each of these is discussed in greater detail in the proceeding paragraphs.

With regards to facilitation, peer education has been identified as important for improvement in the outcomes for adolescents (J. M. Stephenson et al., 2008; J. M. Stephenson et al., 2004). Specifically, a key factor in the effectiveness of sexual education programs targeting adolescents is to include peer educators in the design, as well as the delivery of the programs (Puentes & Wassel, 2003). Research also highlights the influence of peer educators who are trained, as a review has identified that programs incorporating trained peer educators were more effective than those with adult educators (Poobalan et al., 2009). Despite this, few studies within this literature review incorporated peer educators in their intervention programs, with the majority of the studies examined focusing on school based education methods involving teachers and other professionals rather than peers (Pickert et al., 2009; P. Smith, Realini, Buzi, & Martinez, 2011; Smylie, Maticka-Tyndale, & Boyd, 2008; Trenholm et al., 2008).

Another key finding within our review is that there is controversy associated with the ideal content of programs. In their review, Poobalan et al. (2009) found that studies evaluating programs focused on a single target behaviour and specific content at one point of time were effective in producing positive outcomes. In contrast, a review of interventions by Downing, Jones, Bates, Sumnall and Bellis (2011) showed that programs targeting multiple and broader health behaviours, compared to fewer and specifically sexually related, were more effective. However, these effects were identified as small and specific to short term success, and, as the interventions were specific to parent and family based interventions, it is difficult to generalise these findings. These findings indicate that, while the content of programs is important for producing effective results, the evidence of impact is mixed. It is suggested that programs need to provide adolescents with a narrow focus by only targeting a single
behaviour at any one time. This implies that adolescents need time to cement their understanding of concepts and that content must be salient in order to be absorbed. Conversely, it is suggested that it is more effective to target multiple health behaviours rather than fewer. This may indicate that providing adolescents with a broader range of target behaviours allows them to understand the possible interactive impact of various health behaviours on one another.

Given this difference in findings, we examined the limitations of each review. Both reviews used guidelines to determine the appropriate criteria for the studies they included within their reviews and utilised similar quality assessment controls. The methods used in the Poobalan et al. (2009) review examined a variety of studies, many of which included randomised controlled trials (RCTs), and while meta-analyses were included, the majority were narrative summaries. Despite this, as only reviews of studies were examined, analysis of specific aspects of individual programs was not undertaken. Thus, findings are reliant on the those reported within the reviews examined by Poobalan et al. (2009). In comparison, Downing et al. (2011) assessed studies and programs individually and thus findings were more specific, rather than based on other overall reviews, which may mean that certain findings were highlighted more than others. This suggests that the study by Downing et al. (2011) is the more robust of these two studies.

Context has also been identified as an important factor in the effectiveness of programs but one that appears to be underutilised. Specifically, the literature examined indicates that, though effective environments are community-based ones (such as health clinics), few studies within our review included programs within these settings (Barker, Ricardo, Nascimento, Olukoya, & Santos, 2010; Poobalan et al., 2009). Within the literature examined in this section, of the studies recruiting samples from clinics and community-based settings, the majority measured sexual education in relation to outcome variables (Ancheta, Hynes, & Shrier, 2005; Crosby, Hanson, & Rager, 2009; Voisin, Tan, Salazar, Crosby, & DiClemente, 2012). Few included a specific intervention or program based on the context of the setting they had recruited from (Dilorio et al., 2006; Fisher et al., 2011). As an illustration, Fisher et al. (2011) examined longitudinal changes in sexual risk outcomes for adolescents using condom education and safer sex programs across a variety of community settings, including clinics and colleges. Reductions in
important risk factors (e.g. unprotected sex), were observed consistently post-intervention at 30 and 120-days. Additionally, a review by Barker et al. (2010) identified that, of the 58 intervention programs examined, seven used community and eight used service-based settings, with a total of seven evaluated as effective and six as promising. Comparatively, there were 22 group and 21 integrated programs with far fewer evaluated as effective (2 and 8, respectively). These findings indicate that community and health settings are important in producing effective intervention programs but the current literature highlights the lack of studies utilising these settings. Despite these findings, limitations exist with community-based intervention programs primarily because the populations within these studies are identified as higher risk, based on gender (Dilorio et al., 2006) or ethnicity (Barker et al., 2010; Fisher et al., 2011; Lightfoot, Comulada, & Stover, 2007).

Duration of interventions has also been identified as an important factor in terms of behaviour change within sexual education programs. While studies have failed to identify one singular, optimal timeframe for an intervention, in overall terms shorter, more frequent sessions have been found to be more effective than fewer, longer ones. Shorter duration with subsequent maintenance sessions was also found to be effective (e.g. 4 sessions followed up with 3 sessions spaced over three semesters) (Lederman, Chan, & Roberts-Gray, 2008). Moreover, those with a long implementation period with booster sessions have also been found to be effective (e.g. 90-120 minute sessions over 8-weeks) (Pedlow & Carey, 2004; Poobalan et al., 2009).

Time between pre and post-test of intervention measures has also been indicated as a factor which may impact the effectiveness of sexual education methods. Studies implementing interventions have shown varied results between pre and post-test, with differences in the follow up time ranging from directly after completion to 7 years (Barnett & Hurst, 2003; J. M. Stephenson et al., 2008). In the case of studies involving short follow up times, programs may not allow sufficient time for knowledge and attitudes to be cemented. Thus, no change is detected between implementation and reassessment. By contrast, longer studies may allow a greater gap between implementation and reassessment, which may lead to more opportunity for adolescents to engage in sexual behaviour, particularly if they were younger at the beginning of the program (Downing et al., 2011). From a methodological perspective, therefore, the
above findings can be questioned, as the time between pre and post assessment can change the results.

Programs with a theoretical basis have also been identified as a relevant factor in the effectiveness of sexual education programs, specifically, programs based on Social Cognitive Theory (SCT) and the Theory of Planned Behaviour (TPB) (Poobalan et al., 2009). For example, a study by Dilorio et al. (2006) found that adolescents allocated to an intervention group based on Social Cognitive Theory (SCT) showed greater knowledge improvement than those in the life skills knowledge program. Similarly, findings from the review by Poobalan et al. (2009) found that SCT had positive effects (e.g. increase in intention to use condoms). Additionally, a study by Abraham, Henderson, and Der (2004) implemented a randomised controlled trial of a teacher-delivered sexual education program based on the TPB to 13-15 year old school students. The study demonstrated the intervention was effective in promoting more positive attitudes and beliefs towards alternatives for sexual intercourse and condom use but not in changing behaviour – a finding that is consistent with the review by (Poobalan et al.).

Unfortunately, few studies identified within the literature review in this thesis focused on programs with an underlying theoretical basis, indicating that further research is required to determine whether the programs utilising these theoretical underpinnings are consistent in their effectiveness.

Ethnicity and cultural sensitivity have also been identified as important in assessing the effectiveness of sexual education programs (Poobalan et al., 2009). A number of studies within this review section focused specifically on programs targeting HIV/AIDS. They suggest that, in African American and Hispanic populations, interventions targeting HIV are effective in promoting parental communication about sexuality and comfort about discussing sexual issues with their adolescent children (Dilorio, McCarty, Resnicow, Lehr, & Denzmore, 2007; Dilorio et al., 2006; Fisher et al., 2011). Additionally, they show a reduction in risky sexual practices amongst minority populations within community settings (Fisher et al., 2011). A limitation of these studies is that the interventions focus on specific ethnic groups so that the findings cannot be generalised to other adolescent populations. Thus, further research needs to be done with such programs, focusing on populations other than ethnic minority groups, to determine potential effectiveness more broadly. Despite this limitation, however, these
findings suggest that studies should address cultural factors specific to the target population in order to develop and implement effective HIV/AIDS programs, as well as sexual education programs more generally.

Further limitations exist specifically within these sexual education studies. Firstly, several studies were conducted as pilot studies and, thus, further validation of findings is required (Barker et al., 2010; Herrman, Waterhouse, & Chiquoine, 2011; Paul, Bell, Fitzpatrick, & Smith, 2010a). Secondly, the measures or outcomes required for effectiveness of an intervention varied between studies, making it difficult to produce directly comparable findings. This indicates that further research and evidence are required to develop the key, most up to date measures of effectiveness, and to ensure that these are applied appropriately and tailored to aspects found to differentiate particular adolescent populations from one another, such as gender, ethnicity, and level of risk (Downing et al., 2011; Oringanje et al., 2009; Poobalan et al., 2009).

Overall, it seems that there are several key concepts required to produce effective sexual education programs. As suggested in the introduction, there are many different modes of delivery for the information provided within sexual education programs. Thus far, despite inconsistent evidence, programs which are theory based (Realini, Buzi, Smith, & Martinez, 2010), and provide appropriate training of facilitators (Barnett & Hurst, 2003; Poobalan et al., 2009) are factors which have been shown to improve the effectiveness of sexual education programs. In 2007, Kirby and colleagues undertook a systematic review of 83 studies of sexual education and HIV prevention programs, in order to determine the common characteristics of effective sexual health behaviour change programs (Kirby, Rolleri & Wilson, 2007). These findings, although limited, are consistent with several of the characteristics considered important in developing and implementing effective sexual education programs. The literature also indicates, however, that while there are strong indications for some factors, inconsistencies remain within the literature that require attention. One of these inconsistencies, is around the duration, or number of hours of sexual education received and further investigation is warranted.

2.3.2 Impact of sexual education on sexual attitudes

This section looks at papers reviewed that address the impact of sexual education on the sexual attitudes of adolescents. Within this review, attitude is defined as an adolescent’s
way of thinking, values or beliefs about sexuality, contraception, sexual behaviour and sexual education. This section examines the key themes arising from the literature.

Several studies within this review found that receiving sexual education, regardless of type, was associated with more positive sexual attitudes towards condom use, persons with AIDS, and beliefs in the abstinence message among female adolescents (Ancheta et al., 2005; Borgia, Marinacci, Schifano, & Perucci, 2005; Sulak, Herbelin, Fix, & Kuehl, 2006). As an illustration of this, Ancheta et al. (2005) found that, among a sample of high risk female adolescents and young people, receiving either parental or formal education regarding pregnancy was associated with a higher score on a condom use attitudes scale. Similarly, Borgia et al. (2005) found the attitudes of adolescent females towards persons with AIDS became more positive between pre and post-test assessment, regardless of whether the intervention was teacher or peer-led. These findings are also consistent with a study by Sulak et al. (2006). This found, on completion of a school-based sexual education program, an increase in the attitudes: that sex is not a safe activity for teens; in the unacceptability of unmarried teens being pregnant; and in the desirability of waiting to have sex until married. Conversely, Barnett and Hurst (2003) found that, in examining the impact of abstinence education, there was no statistically significant difference in attitudes towards the belief in the message of abstinence between females and males. This was regardless of whether they were in the intervention or control group.

Several studies indicated that informal methods of sexual education, such as via parents and siblings, can have a positive impact on female adolescents’ sexual attitudes towards safe sex (Bleakley, Hennessy, Fishbein, & Jordan, 2009; Kowal & Blinn-Pike, 2004; Somers & Surmann, 2005). As an example, Kowal and Blinn-Pike (2004) found that adolescents’ discussions with parents were predictive of adolescents attitudes towards sex and that adolescents’ attitudes were ‘safer’ when more frequent discussions about these issues were reported with both their parents and siblings. On a similar theme, Somers and Surmann (2005) found that, for female adolescents attending school, there was a correlation between education from adults – other than those teaching sexual education – about love/marriage and whether premarital sex was right or wrong, with less adolescent approval of premarital sex. Additionally, Bleakley et al. (2009) found an association of mothers as sexual educators for adolescents, with a decrease in the belief
of sex not resulting in a negative outcome (e.g. STD/HIV). Fathers, as educators, showed a decrease in the belief that peers would approve of having sex within twelve months. These findings also showed that for females, beliefs were more salient when associated with mothers, and for males, beliefs were more salient when associated with their fathers.

In relation to sources of informal sexual education, studies indicate that friends, peers, and other informal sources such as the media, are related to more risk-prone attitudes, beliefs and values towards sexual activity amongst adolescents (Bleakley et al., 2009; Somers & Surmann, 2005). As an illustration, Bleakley et al. (2009), found that informal sources of sexual education such as cousins or friends were associated with the belief that sex in the next twelve months would result in positive outcomes for both themselves and their partner. They also found that adolescents who identified cousins as a source of sexual education had a greater belief that sex would not result in an STD or HIV (i.e. a more risky sexual practice). The study also indicated that adolescents who identified media as a key source for sexual education (i.e. movies and television), had greater beliefs that engaging in sexual intercourse would have positive outcomes for themselves, than those who did not. Similarly, Somers and Surmann (2005) found that among a sample of 672 adolescents between Years 9 and 12, clarity of personal values was reduced for adolescents when they reported learning more about the reproductive system and menstruation from peers. This was also true when media was used as a source of information regarding petting, and whether premarital sex was right or wrong, and particularly so for females, as findings showed an association between greater learning about sexual intercourse from the media and increased approval of premarital sex.

The findings of this section indicate that the source of sexual education may have an impact on attitudes towards sexual behaviour. More specifically, informal sources of sexual education, particularly friends, peers and the media, appear to be associated with more risky attitudes towards sex and condom use. Conversely, using parents and siblings as sources of information is associated with more positive attitudes and beliefs. If negative attitudes towards sexuality are linked to peers, friends and the media, there is an increased likelihood they are also a source of knowledge. As the exact nature of the relationships between knowledge, attitudes and behaviour is not fully understood, it is
necessary to recognise the possible importance and influence of these sources. These findings also suggest that there is a relationship between SE and attitudes but that, based on the literature to date, it is unclear whether this relationship has any impact upon sexual behaviour.

2.3.3 Impact of sexual education on sexual knowledge

This section examines the impact of sexual education on the sexual knowledge of adolescents. Sexual knowledge is defined as the understanding of the physical aspects of reproductive health, an understanding of the facts and consequences associated with STIs and HIV/AIDS, and an understanding of methods of contraception. In this review, most of the studies subscribe to this definition of sexual knowledge.

Key themes emerged upon examining the literature relating to the impact of sexual education on knowledge. Studies found mixed evidence for gender differences in knowledge improvement over time (Borgia et al., 2005; Coyle, Kirby, Marín, Gómez, & Gregorich, 2004). Of key interest, several studies found that, though there were improvements in knowledge after completion of sexual education (Barnett & Hurst, 2003; Capuano, Simeone, Scaravilli, Raimondo, & Balbi, 2009; Coyle et al., 2004; Kim & Free, 2008), there was mixed evidence as to whether this increase in knowledge through sexual education (either formally, or through family and friends), had any specific benefit to adolescents in terms of sexual activity (Ancheta et al., 2005). These findings are discussed in greater detail below.

Several studies indicated that peer-led sexual education programs had a positive impact on the sexual knowledge of adolescents (Borgia et al., 2005; Kim & Free, 2008; Paul et al., 2010a; Smylie et al., 2008). As an illustration, Borgia et al. (2005) compared a teacher-led group and peer-led group and found that, in comparison to the teacher-led group, students in the peer-led group demonstrated a greater increase in sexual knowledge scores. This finding was consistent with that of Paul et al. (2010a), who found improvement in knowledge of a sample of early school leavers after they received peer-led education. Conversely, J. M. Stephenson et al. (2008) conducted a randomised trial of peer-led sexual education compared to teacher-led education and found no difference in knowledge between the intervention and control groups. The difference in findings between these studies may be attributable to specific factors such as the length of follow up. For example, J. M. Stephenson et al. (2008) followed adolescents over 7
years, while the other studies cited above involved shorter follow up times (5 months and 6 weeks respectively). Despite this, these findings indicate that, though peer-led sexual education may improve sexual knowledge in the short term, the gains in improvement of knowledge early on may decay over time.

Studies assessing differences in knowledge between males and females participating in similar sexual education programs show widely different results (Borgia et al., 2005; Poobalan et al., 2009). Borgia et al. (2005) evaluated the effectiveness of an AIDS prevention program between a peer-led and a teacher-led group. They found that females showed greater improvements in knowledge than males between pre and post-test assessment across both groups. These findings are in contrast to those of other studies which found no difference in knowledge on the basis of gender (e.g. Borawski, Trapl, Lovegreen, Colabianchi, & Block, 2005). As an example, Barnett and Hurst (2003), conducted two evaluations on school students in years 8 and 10, using an abstinence-only intervention, one using pre and post-testing and the other utilising a control group. Overall, they found no difference in knowledge scores between males and females. These findings are again different to those of Coyle et al. (2004) who implemented a RCT of a theoretically based curriculum to over 2,000 sixth grade students & tracked them over thirty-six months. They found that statistically, within the intervention group, boys demonstrated significantly better knowledge than girls. While such differences may be attributable to the intervention type, i.e. abstinence or comprehensive, or the content examined between these studies, these findings indicate inconsistent evidence across sexual education programs in regard to gender. This suggests that males and females may require tailored teaching methods, such as learning in separate groups based on gender. Additionally, it has been suggested that particular information is more salient depending on gender. For example, females may worry more about pregnancy and so knowledge relating to pregnancy prevention is more important to them than for males (Poobalan et al., 2009).

A further finding within this review indicates that, in higher risk samples, there is little or no evidence of a relationship between sexual education and a change in sexual knowledge. High risk adolescents include those being treated for STIs, or attending public health clinics. As an example, Ancheta et al. (2005) found that, in a sample of adolescents and young women being treated for STDs, variations in the type/content of
sexual education (such as formal compared to informal i.e. parental, and timing or location) were not associated with differing levels of STD risk knowledge. Additionally, Voisin et al. (2012) found that among 715 African American female adolescents attending public health clinics, participation in sexual education classes was not associated with level of STI risk knowledge. These findings indicate that, among high risk adolescent populations, factors other than participating in sexual education classes and timing or location of sexual education are likely to be more relevant in improving sexual knowledge.

Several limitations must be mentioned in regard to the examination of these studies. In particular, the definition of knowledge between papers was quite variable, in that several papers only defined knowledge of HIV/AIDS and did not examine other STIs. Others did not look at knowledge of factors such as pregnancy or contraception. Additionally, a number of studies were targeted at specific minority or high risk populations, making the results less generalisable.

Despite these limitations, the findings of the studies discussed above indicate that the evidence for the impact of sexual education on sexual knowledge amongst adolescents is inconclusive. Of particular importance are the findings of several papers indicating that, despite improvements in sexual knowledge from different sexual education interventions, there was no relationship between the knowledge of adolescents and their behaviours. That is, improvements in sexual knowledge of factors such as STIs, HIV/AIDS, pregnancy and contraception have not been seen to improve the risky sexual behaviours of adolescents. These findings suggest that further investigation into the relationship between sexual knowledge and sexual behaviour is required as this will help to determine appropriate approaches to effective sexual education.

2.3.4 Impact of sexual education on sexual behaviours

This third section examines the impact of sexual education on the sexual behaviours of adolescents. In this thesis, sexual behaviours are defined as risky sexual practices that adolescents are likely to engage in, such as unprotected sex, non-use of contraceptives such as condoms or hormonal contraception, multiple sexual partners; that is, practices that would put them at risk of contraction of STIs or HIV, or pregnancy. The majority of papers identified and examined within this literature review subscribed to this definition of risky sexual behaviour.
Several studies indicated the effectiveness of abstinence-only education programs in improving factors, such as knowledge of STDs, however, subsequent intentions or actual changes in sexual risk behaviours were not seen in comparison to other methods of sexual education (Barnett & Hurst, 2003; Borawski et al., 2005; Trenholm et al., 2008). As an illustration of this, Barnett and Hurst (2003) conducted an abstinence-only intervention utilising a treatment and a control group of students in Year 8 and assessed at both pre- and post-test. Findings showed that, while adolescents in the treatment group improved their sexual knowledge, no difference in change in sexual behaviour was seen in either the treatment or control groups.

Similarly, Trenholm et al. (2008) examined four abstinence-only education programs and found that, while one program had an impact on knowledge of STDs, there was no impact on sexual activity or differences in rates of unprotected sex for adolescents. In contrast, Denny and Young (2006) found differences in knowledge and subsequent sexual behaviour across three different year level samples of adolescents. Findings showed that, in the short term, an increase in knowledge was only seen in the youngest group. In the long term (18months), however, this increased knowledge continued for the youngest group, and was seen in the eldest group but not the middle group. In terms of behaviour, in comparison to controls the youngest group showed lower rates of participation in sexual intercourse at both time points. The eldest group, despite showing greater levels of knowledge, only differed with the comparison on intent to abstain, rather than the lower rates of participation in sexual intercourse that they had shown at the previous time point. These findings indicate that the evidence for the effectiveness of abstinence education programs on sexual knowledge and subsequent sexual behaviour is currently inconsistent, or at least no more effective than other forms of SE which have been used as control or comparison groups.

Several studies had similar findings that, notwithstanding improvement in knowledge being demonstrated upon completion of comprehensive methods of sexual education, this improved knowledge was not associated with changes in sexual behaviour (Borgia et al., 2005; Coyle et al., 2004; Dilorio et al., 2006). For example, Coyle et al. (2004) evaluated the long term effectiveness of a theoretically based curriculum by tracking students in grade 6, over 36 months. The study found that, within the intervention group, improvements in knowledge were found across time for boys and girls, though
knowledge was found not to be related to whether students had had sex in the last 12 months. In comparison, Roberto, Zimmerman, Carlyle, and Abner (2007) found that, on completion of a computer-based approach to preventing pregnancy, STDs and HIV, students in the intervention group not only improved knowledge, but were reportedly less likely to initiate sexual activity. These studies are not directly comparable because of differences in the programs. Overall, however, the findings suggest that, though comprehensive sexual education interventions may be effective in improving sexual knowledge among adolescents, evidence for the relationship between sexual education, knowledge and behaviour is inconclusive.

Several studies found that peer-based sexual education was more effective in producing positive sexual behaviour outcomes when compared to non-peer based education (Borgia et al., 2005; Sieving et al., 2011; J. M. Stephenson et al., 2008; J. M. Stephenson et al., 2004). As an illustration, Sieving et al. (2011) completed a randomised-controlled trial to examine the effectiveness of Prime Time, a clinic based intervention to prevent pregnancy risk behaviours. At twelve months, the intervention group reported greater consistency in use of condoms, hormonal contraception and dual contraceptive methods with the most recent partner, in comparison to the control group.

A theme found across several studies indicated that the source and timing of sexual education was linked to subsequent sexual behaviour for adolescents, such as first sex and condom use (Berenson, Wu, Breitkopf, & Newman, 2006; Schubotz, Rolston, & Simpson, 2004; Somers & Surmann, 2005). Somers and Surmann (2005) found, for example, that females engaged less frequently in sexual behaviour when school based sexual education regarding teen pregnancy was received at an earlier age. Less frequent sexual behaviour was also found to be associated when education about the importance of birth control, and activities such as sexual intercourse, were taught at an earlier age. By contrast, for males, learning about nocturnal emissions at an earlier age was related to more frequent sexual behaviour.

A key finding indicated that, for adolescents, friends as the main source of sexual education was highly correlated with an earlier age of first sexual intercourse without contraception. Haglund and Fehring (2010) indicated that adolescents who received abstinence or abstinence-plus SE were equally less likely to have had sex. Those who received education containing abstinence messages, compared to those who did not,
were 17% less likely to have had sex than those without any formal sexual education. Additionally, participants in abstinence-only education had the fewest partners, followed by those in abstinence-plus education.

In contrast, Ancheta et al. (2005) found no association with a range of sexual education variables such as - receiving any parental education; or receiving formal education on topics of pregnancy, STDs and birth control - with the consistent condom use or condom use at last sex among a group of high risk adolescent females. Similarly, Barnett and Hurst (2003) found no difference in the sexual behaviours of adolescents upon completion of sexual education, regardless of whether they had participated in the conventional control or abstinence-only treatment groups.

The literature undertaken for this thesis has found that limitations exist in terms of both the definitions of sexual behaviours and the measurement of the behavioural outcomes. In many studies, the behavioural outcomes are self-reported measures and, depending on the length of time between pre and post assessment, accuracy of self-report of sexual behaviours may be compromised. Additionally, while many papers subscribe to the definition of sexual behaviour given at the beginning of this section, the main focus and the number of behaviours varied between studies. It is therefore difficult to compare directly findings from one study to the next.

Overall, however, these findings suggest that studies utilising peer education methods are effective in encouraging safer sex behaviours, such as condom and contraceptive use. A key finding within this section is the relationship between particular sources of sexual education on specific behavioural outcomes, such as less frequent sexual behaviour. This suggests that the source of sexual education may be an important factor in positively influencing adolescents’ sexual behaviour. That said, these findings were not consistent across studies, indicating that, while source may be important, this may be influenced by factors such as age, gender, and the risk profile of the target group.

2.4 Limitations
Limitations specific to key studies have been addressed within the discussion, hence this section addresses broader limitations of the literature reviewed. Many studies examined in this review lacked generalisability since they focus on specific and often high-risk populations, such as ethnic minority groups. Hence, the findings from these studies can
only be related to these specific populations, and are not easily applicable to an overall adolescent population.

Key limitations in relation to the findings in this review were seen across the four discussion sections. Specifically, the differences in assessment of the variables, and the subsequent evaluation of the outcome measures, were found to vary across studies. Similarly, for each of the variables, many studies were comprehensive in their assessment of knowledge, including measures of STIs and HIV/AIDS and physical anatomy, whereas other studies were more narrowly focused, e.g. only focused on HIV/AIDS based knowledge. Moreover, examining attitudes in the literature review highlighted that studies varied greatly in the sexually related attitudes they were measuring. It is difficult to draw firm conclusions about the relationship between sexual education and adolescent sexual attitudes, as some studies have found improvement in adolescent sexual attitudes (Ancheta et al., 2005; Borgia et al., 2005), while others have not (Barnett & Hurst, 2003; Paul et al., 2010a)

2.5 Chapter summary
This chapter has examined the literature relating to the effectiveness of sexual education methods, and the impact of sexual education on adolescent sexual attitudes, knowledge and behaviour. Drawing definitive conclusions from current literature in relation to all these areas involves substantial challenges resulting from inconsistent research methodologies, study cohorts and timescales.

In examining the literature on effectiveness of methods, the key findings indicate that there are specific factors that may contribute to the effectiveness of particular intervention programs. These are: context of the delivery of the intervention; duration of the intervention; time between pre- and post-test training; selection of facilitators (with peers highlighted as an effective delivery method); and, tailoring the programs to target groups (such as ethnic and high-risk groups).

With respect to the efficacy of sexual education programs, the papers identified within this review highlighted the important role of health behaviour theories and models when writing and implementing programs. Since this area was not addressed comprehensively within this review, the role of health behaviour models in understanding sexual risk-
taking behaviour among adolescents are, therefore, addressed in chapter four of this thesis.

As things stand, the overall gaps in the current literature are substantial, in that there are many facets of this area of research that are currently lacking consistent evidence. A primary gap in the literature is the lack of consistent findings in the research in terms of the relationship between sexual education and sexual knowledge, attitudes and behaviours. This problem is compounded by inconsistent measures of effectiveness in terms of the links between sexual education, attitudes, knowledge and behaviour, hence the aim of this present thesis is to address some of these limitations.

In addressing these limitations identified within this review, this thesis looks at the relationship between sexual education, sexual knowledge, and behaviours amongst adolescents in two studies. Study 1 will focus on examining hours of sexual education received by adolescents, as well as the source of sexual education they receive. Aspects of sexual education that have, as indicated by this review, received minimal attention. Study 2 will expand upon these findings using qualitative methods. It is intended that further investigation of these variables will help in addressing existing gaps in this field, and add to the existing body of literature by undertaking research based on an Australian adolescent sample.
3  CHAPTER THREE: METHODS

3.1 Introduction to Mixed Methods

This chapter describes the approach undertaken within this research, namely, a mixed methods approach. Specifically, this chapter explores the fundamental principles and characteristics of mixed methods research and typical applications within the sexual health and behaviour literature, before outlining the specific design of this thesis.

3.1.1 How is mixed methods research defined?

The definition of mixed methods research has evolved in a number of ways over the last few decades (Greene, Benjamin, & Goodyear, 2001; Greene, Caracelli, & Graham, 1989). Broadly, mixed methods can be defined as designs which include at least one quantitative method (i.e. using numerical data) and at least one qualitative method (i.e. collection of words) (Creswell & Plano Clark, 2011; Greene et al., 1989).

In order to produce a unified and more comprehensive definition that would accurately capture the meaning of mixed methods research, Johnson, Onwuegbuzie, and Turner (2007) examined various definitions from multiple experts in the field. The most similar and common themes were extracted from these responses to ensure that the final definition included the key elements of mixed methods research. This definition of mixed methods research used throughout this body of work is described in Box 3.1 below.

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration. A mixed methods study would involve mixing within a single study; a mixed method program would involve mixing within a program of research and the mixing might occur across a closely related set of studies. (p.123)

3.1.2 What is the premise?

There are two distinct paradigms within methods of research and these are the quantitative and qualitative approaches to undertaking scientific research. More recently it has been argued that the mixed methods approach, that is the combination of these
two fundamentally different approaches, makes a third paradigm (Johnson et al., 2007). The theories underpinning both quantitative and qualitative approaches to research are inherently different. Quantitative research can be described as using statistical analyses to examine numerical data to explain a particular phenomenon in question. On a theoretical or philosophical level, this paradigm is underpinned by a positivist or realist approach, whereby reliable instruments are used to measure objectively the world based on rules and assumptions. In contrast, qualitative research utilises a more exploratory approach and is subjectivist in nature. Unlike purists in quantitative research, qualitative purist researchers believe that there is no one objective understanding of a phenomenon and that, as observers, we have the ability to impact upon the phenomenon being studied (Creswell & Plano Clark, 2011). Data collection within qualitative research is more textual in nature and uses methods such as observation and interviews, and the resulting analysis is based on an interpretive viewpoint.

These definitions, in their traditionalist forms, indicate that there is a strong opposition between the two paradigms and that reconciliation of two approaches is difficult. Philosophically, some writers have debated whether mixed methods research is even possible due to methods being linked to paradigms, because by mixing methods, researchers are essentially mixing (possibly incompatible) paradigms. This is a viewpoint adopted by purists, who argue that paradigms have strict boundaries and cannot be mixed and that such mixing violates the purist stance. Within mixed method literature, this has been referred to as the mixing of viewpoints.

Over time, however, there has been a more open-minded approach to mixing paradigms (Cameron, 2011; Tashakkori & Teddlie, 2010). This began with the idea that it may be possible to combine aspects of paradigms together within a study - a perspective that was extended by Johnson & Onwuegbuzie (2004), who identified the possibility of removing the need for the link between paradigms and methods, thus expanding the approach.

There is a growing body of research that demonstrates the value in combining these methods to produce well-rounded research. In 2010 the US National Institutes of Health (NIH) commissioned the Offices of Social Science and Research (OBSSR) to produce a handbook for best practice in mixed methods research, which was published in 2011.
This handbook addressed both the practical, theoretical and philosophical concerns that surround mixed methods research. This was based on a review by the NIH that found a considerable increase in the number of funded studies, within a range of health fields, utilising a mixed or multi-method design in their research. The NIH pointed out that there is a “priority that exists in health science research to develop new methodologies to improve the quality and scientific power of data…” and that there had been an increase in the sophistication of mixed methods research within the behavioural and social sciences (Creswell, Klassen, Plano Clark, & Smith, 2011). These findings provided evidence for the importance of research that utilises the benefits of combining quantitative and qualitative research methodologies.

3.2 Theoretical Perspectives of Mixed Methods

Mixed methods research is based on a variety of theoretical perspectives (or frameworks) and, as when designing any study, a researcher will have a perspective which underpins the reasoning of a particular method chosen for their study. The key theoretical perspectives pertaining to mixed methods research are described briefly in Table 3.1 below.
Table 3.1

Theoretical perspectives of mixed methods research

<table>
<thead>
<tr>
<th>Theoretical Perspective</th>
<th>Description</th>
<th>Key sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dialectical view</td>
<td>Notion that using different paradigms allows the development of more inclusive, perceptive and rational conclusions than one or other of the paradigms could on their own</td>
<td>(Cameron, 2011; Greene et al., 2001; Tashakkori &amp; Teddlie, 2010)</td>
</tr>
<tr>
<td>Substantive theory view (program theory)</td>
<td>Argument that the research is driven by the meaningful issues and the program/intervention under examination, rather than the methods, being used to evaluate the issue</td>
<td>(Greene et al., 2001)</td>
</tr>
<tr>
<td>Alternative paradigm theory (or single paradigm stance)</td>
<td>Attempts to encapsulate ‘all sides’ of the multiple paradigms, avoiding the oppositional nature traditionally encountered by differing paradigms. Mixing methods represents good practice; in turn this produces better comprehension, leading to informed action</td>
<td>(Greene et al., 2001; Tashakkori &amp; Teddlie, 2010)</td>
</tr>
<tr>
<td>Pragmatism (pragmatic view)</td>
<td>Focus on the responsiveness to context which drives the decision-making methodology; resolving the differences in paradigms is not the key concern</td>
<td>(Feilzer, 2010; Greene et al., 2001)</td>
</tr>
</tbody>
</table>

A dialectic stance considers the importance that any paradigm has to offer research, and therefore, in investigating a particular phenomenon, supports the use of multiple paradigms within a study to provide a better, overall understanding of the phenomenon. The substantive theory view (also known as program theory) aspires to focus on the considerable issues and programs under examination, rather than being determined by the methods used (Greene et al., 2001). The single paradigm stance (Tashakkori & Teddlie, 2010) was initially provided as a philosophical foundation for mixed methods research, and was then refined by Greene (2007) and renamed as the ‘alternative paradigm’. This stance took into consideration that there is often a need for mixing methods and that such a paradigm was not concerned by issues of disparate philosophical beliefs. In a similar vein, pragmatism was considered by some to fit the role of a philosophical partner for mixed methods, as its emphasis is on the importance
of research questions, the significance of experiences, and the practical implications, action, and comprehension of events as they occur in the real-world (Johnson & Onwuegbuzie, 2004).

When examining these theoretical perspectives, it is possible to see that each has something different to offer in thinking about how to approach mixed methods research. In addressing the research objectives of this thesis, understanding the experiences of adolescents is integral to the practical implications and subsequent actions in the broader context of their sexual heath and its relationship with sexual education. Hence, this study has been designed using a pragmatic theoretical framework.

### 3.3 Mixed Methods Study Design

In determining the specific design of a mixed methods study, Creswell and Plano Clark (2011) have identified several key principles that should be considered when undertaking this process, including: using a fixed and/or emergent design; identifying the design approach; matching the design to the research problem, purpose and questions; and, being specific about the reasons for mixing methods (i.e. having a clear rationale for doing so). Table 3.2 describes the key features of commonly utilised design classifications often used in the field of evaluation within mixed methods research. First developed by Greene et al. (1989), and then expanded upon by Greene and Caracelli (1997), these classifications establish key reasons for mixing methods. The focus of this approach is to classify the mixed methods designs based on their usefulness and to consider how a particular design might be adapted to the specific objective and questions of a study. Each of the designs are briefly discussed in order to identify the proposed design and purpose for the present study.
Table 3.2
Commonly utilised design classifications in mixed methods research

<table>
<thead>
<tr>
<th>Study design</th>
<th>Aims</th>
<th>Key sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation</td>
<td>Seeks amalgamation, validation, and conformity of findings from the different methods used</td>
<td>(Creswell, Plano Clark, Gutmann, &amp; Hanson, 2003)</td>
</tr>
<tr>
<td>Complementarity</td>
<td>Seeks expansion, improvement, illustration, and amplification of the findings from one method with those from the other methods</td>
<td>(Greene et al., 1989; Johnson et al., 2007)</td>
</tr>
<tr>
<td>Development</td>
<td>Where development is largely seen to include implementation and sampling, as well as measurement decisions, this design aims to use the findings from one method to help expand or inform the other method</td>
<td>(Greene et al., 1989)</td>
</tr>
<tr>
<td>Initiation</td>
<td>Seeks new viewpoints of frameworks, to find the inconsistencies, and the re-forming of questions or findings from one method</td>
<td>(Greene et al., 1989)</td>
</tr>
<tr>
<td>Expansion</td>
<td>By utilising different methods for different elements of the inquiry, this design seeks to extend the scope and range of inquiry</td>
<td>(Greene et al., 1989)</td>
</tr>
</tbody>
</table>

Greene et al. (1989), identified complementarity as a means of mixing both qualitative and quantitative methods to measure both the overlapping, as well as the different components of the phenomenon in question. They argued that, by doing so, this would lead to a richer and more elaborate understanding of the phenomenon being studied. Prior to this, Rossman and Wilson (1985) had identified elaboration as one of three key functions in mixing methods, highlighting its utility in providing richness and detail of findings across methods. Subsequent to this, Greene et al. (1989) also identified elaboration as serving a purpose in mixed method design, however they considered its utility to be embedded within the purposive construct of complementarity. The process of development involves utilising the results from one method to aid in informing or further developing the additional method being used.
3.4 Advantages and Disadvantages of Mixed Methods Research

As with any method of research, there may be both advantages and disadvantages to the design used within a study. This section discusses some of the advantages, as well as the challenges of mixed methods research, and addresses how the present research aims to overcome these.

Mixing methods may serve to strengthen a study by removing the potential weaknesses that either the qualitative or quantitative methods may introduce when used on their own. For example, it has been suggested that quantitative data collection is only interested in numerical information and there is a weakness in not providing a context or a voice to the participants whose information is being obtained. In this respect, qualitative methods seek to identify this information, providing a balance. In considering the present research, in order to understand the experiences of adolescents as they relate to sexual education, it is important to consider the context of the quantitative information they provide - such as responses on a Likert scale, or the number of years of sexual education received. These quantitative findings serve to provide important comparisons of data sets, but they would be enhanced by understanding the experiential nature and context of those findings via interviews. By comparison, when used as a single method, qualitative research is often considered flawed, as the ‘hands-on’ involvement of the researcher may be seen as introducing bias to the research. A quantitative approach balances this out, facilitated by the use of anonymous surveys or questionnaires, or experimental studies, which limits the direct involvement or influence of a researcher. In addition, many qualitative studies may often have small sample sizes or be single case studies, thus limiting the generalisability of the findings produced. This is in contrast to quantitative studies that often have much larger sample sizes, meaning that findings are often more easily generalizable to a larger population (Creswell & Plano Clark, 2011).

Mixed methods research provides greater evidence for studying a research problem than either paradigm would provide on its own. Researchers have the ability to utilise a range of data collection tools rather than being confined to the types of data collection that would typically be reserved for one type of research or another (Creswell & Plano Clark, 2011). It is suggested that mixed methods research is useful in answering specific research questions that may not be able to be answered by either approach on its own.
For example, questions which require qualitative data to explain quantitative results, or undertaking exploratory qualitative data before conducting an experiment (Creswell & Plano Clark).

Additionally, mixed methods promotes the utilisation of multiple paradigms (i.e. values and beliefs), or worldviews. This frees the focus from the usual connection of particular paradigms being explicitly linked with qualitative research, and other specific paradigms with quantitative research. In doing so, it also creates the opportunity to consider whether a certain paradigm would be suitable in embracing all facets of both quantitative and qualitative research, such as pragmatism, or alternative paradigm theory (Creswell & Plano Clark, 2011).

A key disadvantage or challenge of mixing methods is greater the range of practical skills required in undertaking multiple methods of research. This requires a firm understanding of a variety of quantitative measures and tools, including the use of appropriate statistical software and analyses, as well as an understanding of rules relating to constructs of reliability, validity and hypothesis testing. In order to undertake research using qualitative methods, it is important that the researchers involved are not only able to identify the key phenomenon they are examining, but they must also have the ability to develop appropriate questions for their research. Again, familiarity with the collection of qualitative data is required, for example, in the form of interviews and observations. Undertaking analysis of qualitative data relies strongly upon the researcher’s understanding of the rigorous, scientific testing involved in qualitative research. These scientific methods include credibility and trustworthiness, and other qualitative strategies for validating the data. The skills required to analyse both forms of data are a potential challenge, as is the ability of the researcher to interpret the findings, particularly in the context of conflicting results.

In addition to these issues, there may also be considerable challenges regarding the resources and time required to undertake mixed methods research (Creswell & Plano Clark, 2011). One study may need to be undertaken prior to the next – dependent upon the design – whether this be qualitative followed by quantitative, or vice versa. This may lead to potential limitations overall, particularly if time is a constraint; in research, such constraints are often unavoidable (Johnson & Onwuegbuzie, 2004). Moreover, a
consideration in undertaking mixed methods research and design is familiarity. That is, familiarity with both quantitative and qualitative methods to ensure the research being conducted is scientifically rigorous. In the absence of a strong understanding of how each method works on its own, and how to evaluate its utility, it is difficult effectively to combine methods in research studies (Creswell & Plano Clark).

In summary, there are important advantages to undertaking mixed methods research - most significantly in being provided with a broader scope to address the research problem or question/s under investigation. As indicated, undertaking a mixed methods model also involves challenges. As with any model, these must be taken into consideration when designing a study. These challenges, particularly in regard to familiarity with multiple methods, have been considered and addressed via additional training, and with the option to seek further advice and clarification from experts in the field. In reference to this thesis, the importance of designing a study that encompasses more than one methodology for the collection, integration and interpretation of data, is important and considered necessary to further the understanding of this area of research in a meaningful way.

3.5 Mixed Methods within Sexual Health Research

This section presents the findings of a literature review undertaken to determine current uses of mixed methods research within the sexuality literature. The papers identified are then considered with respect to the mixed methods assumptions and approaches already reviewed. Papers are considered for their theoretical perspective, rationale for using mixed methods, and data type and frequency. The findings are then discussed.

3.5.1 Literature review

A search was undertaken via PsychInfo and Academic Search Complete. The identification of papers that utilised a mixed method approach within the area of adolescent sexual education research was difficult as many studies did not specifically state that they had used a mixed method design or approach in their research. Eight articles were located via this search method after the removal of duplicates, non-Western countries, studies not utilising a mixed method approach and adult samples. Details of the focus, methods of data collection and sample size of these studies are provided in Table 3.3.
### Table 3.3

**Summary of mixed method studies identified**

<table>
<thead>
<tr>
<th>Study</th>
<th>Focus</th>
<th>Methods &amp; Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Brugman, Caron, &amp; Rademakers, 2010)</td>
<td>Comparison of sexual behaviour &amp; attitudes between American &amp; Dutch adolescents</td>
<td>Surveys (n=298); Face-to-face interviews (n=20)</td>
</tr>
<tr>
<td>(Formby, Hirst, Owen, Hayter, &amp; Stapleton, 2010)</td>
<td>Sexual health services in schools &amp; relationship to SRE</td>
<td>Surveys (n=205); Telephone interviews (n=51)</td>
</tr>
<tr>
<td>(Halpern-Meekin, 2012)</td>
<td>School variation in students’ experiences of RME</td>
<td>Survey (n=203), semi-structured interviews (n=92)</td>
</tr>
<tr>
<td>(Kesterton &amp; Coleman, 2010)</td>
<td>Improving parents confidence &amp; ability to talk about SRE with their children</td>
<td>Questionnaires (n=4206). Interviews (n=40 x 4yrs)</td>
</tr>
<tr>
<td>(Layzer, Rosapep, &amp; Barr, 2014)</td>
<td>Evaluation of peer education program</td>
<td>Focus groups: Peer educators (n=62); students (n= 60 students); parents (n=24) Evaluations and surveys: students (n=678)</td>
</tr>
<tr>
<td>(Paul, Bell, Fitzpatrick, &amp; Smith, 2010b)</td>
<td>Feasibility study of peer-led sex education for early school leavers</td>
<td>Questionnaire (n=45) Focus groups: participants (n=25); peer-educators (n=10)</td>
</tr>
<tr>
<td>(Rolston, Schubotz, &amp; Simpson, 2005)</td>
<td>Critical evaluation of sex education in Northern Ireland schools</td>
<td>Questionnaires (n=1013) Focus groups (n=71); One-on-one interviews (n=15)</td>
</tr>
<tr>
<td>(Stephenson, Forrest, Oakley, Copas, Allen, Babiker, Black, Ali, Monteiro, &amp; Johnson, 2004)</td>
<td>Pupil led sex education UK: cluster-randomised intervention</td>
<td>Baseline questionnaire (intervention n=4516, control n=4250). Observation of: peer-educator training (n=23), peer-led intervention (n=57), teacher-led control (n=10). Focus groups: yr 9 students (n=52), staff (n=43).</td>
</tr>
</tbody>
</table>

### 3.5.2 Theoretical perspective – underlying theoretical basis for the methodology provided

Upon examination of the eight studies identified within this search, one study explicitly stated the use of a theoretical perspective as guiding the underlying methodology. One study discussed the importance of a theoretical perspective but no specifics were
provided and the remaining studies did not mention a theoretical or philosophical perspective.

3.5.3 Rationale – reason for combining methods provided

Studies were examined to determine whether a rationale was provided for utilising a combination of methods. In the majority of the studies evaluated, no explicit justification was provided for the mixed methods approach undertaken. The results of the rationales provided are listed in Table 3.4.

Table 3.4

Rationale for combining methods

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>None provided</td>
<td>7</td>
</tr>
<tr>
<td>Triangulation</td>
<td>1 (in discussion section)</td>
</tr>
</tbody>
</table>

3.5.4 Data type and frequency

The methods used within each of the studies, along with the frequencies of each of the methods utilised for data collection were observed. Table 5 displays the frequency and data types used by the studies examined within this chapter.

Table 3.5

Methods and frequency of data collection

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey/Questionnaire</td>
<td>8 (100%)</td>
</tr>
<tr>
<td>Focus groups</td>
<td>4 (50%)</td>
</tr>
<tr>
<td>Interviews: face-to-face</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>Interviews: telephone</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Semi-structured interviews</td>
<td>1 (12.5%)</td>
</tr>
<tr>
<td>Observation (qualitative)</td>
<td>1 (12.5%)</td>
</tr>
</tbody>
</table>
The studies were then examined to determine how frequently the combination of methods was used, for example, survey followed by interview, or focus group followed by survey. Three studies utilised three different methods of data collection. The overall findings are displayed in Table 3.6.

Table 3.6

<table>
<thead>
<tr>
<th>Frequency of Combination</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey + interview: face-to-face</td>
<td>1</td>
</tr>
<tr>
<td>Survey (quant &amp; qual components) + interview: telephone</td>
<td>1</td>
</tr>
<tr>
<td>Survey + Semi-structured interviews</td>
<td>1</td>
</tr>
<tr>
<td>Focus groups + surveys</td>
<td>1</td>
</tr>
<tr>
<td>Survey + focus groups</td>
<td>1</td>
</tr>
<tr>
<td>Survey + focus groups + interview: one-on-one</td>
<td>1</td>
</tr>
<tr>
<td>Survey + observation + focus groups</td>
<td>1</td>
</tr>
<tr>
<td>Survey (baseline quant) + survey (post quant &amp; qual) + interview: telephone</td>
<td>1</td>
</tr>
</tbody>
</table>

Findings of the method types used within this sample of studies indicated that all of the examined studies utilised the survey/questionnaire method, with the next most common method being focus groups. The frequency of combined methods suggested that all examined studies used a survey/questionnaire component that was quantitatively based, combined with another method of a qualitative nature.

3.5.5 Discussion

In examining the results of the above review, with regard to the theoretical underpinning for their research, it was found that one study explicitly stated their underlying theoretical basis as “pragmatic” (Stephenson, Forrest, Oakley, Copas, Allen, Babiker, Black, Ali, Monteiro, Johnson, 2004). One additional study made specific reference to the importance of a theoretical viewpoint, however this was briefly discussed in relation to theory developing a further understanding of the field of research and in helping to answer research questions. A reference to the theoretical perspective underpinning the
present study was not made (Halpern-Meekin, 2012). This highlights that, within the studies reviewed, despite mixed method research pointing to the importance of a theoretical perspective underpinning mixed methods approaches in the context of health research behaviour, a theoretical perspective was either not identified, or discussed.

In considering the results relating to the use of a rationale, of the eight studies examined, none made any specific reference to a rationale or purpose for their use of a mixed methods design in their research. The exception was one study that discussed the merits of utilising both quantitative and qualitative data collection and made reference to the use of “triangulation”. This reference was made at the conclusion of the article however, and was in response to the discussion of the limitations of the study in question (Brugman et al., 2010). Additionally, key findings from this data indicate that within this area of research, the most common method of data collection is via the quantitative survey or questionnaire. This is followed by the use of focus groups and interviews, which varied between telephone, face-to-face and semi-structured.

Several limitations exist with regard to the examination of the above findings. Firstly, it is acknowledged that the majority of the studies examined in this chapter were conducted prior to 2010 - serving to illustrate further that the utilisation of a protocol, such as the Best Practices for Mixed Methods in Health research, was needed sooner than it was made available. In relation to the research contained in this thesis, a clear rationale has been identified in order to address this potential concern, so as to ensure that both the broad and specific aims of this research are addressed. An additional limitation that must be taken into consideration when examining these studies is related to the data types utilised, and their combination and frequencies. It is necessary to note that eight studies is a small sample to examine and therefore difficult from which to generalise results.

In summary, this review of the literature relating to the use of mixed research methods within adolescent sexual education reveals several key findings. Firstly, the lack of reference to theoretical perspectives and, more importantly, a clear rationale or purpose in the undertaking of a mixed methods approach highlights a potentially significant gap in the area of sexual education research. In undertaking the search for this literature, it was evident that studies within this field that utilised a mixed methods design rarely explicitly stated this fact in either their keyword listings or the abstracts. These findings
suggest that there is still a lack of understanding of the importance of very clear communication of the rationale for undertaking mixed methods research. Overall, it highlights that few studies utilised a mixed methods approach in either evaluating or undertaking sexual education research. Furthermore, the review highlights the scarcity of studies specifically undertaking a research process either to evaluate or conduct sexual education interventions with the use of multiple methods. Hence, the present study seeks to address these gaps in the literature by undertaking a mixed methods design that is underpinned by both a theoretical lens and a clear rationale.

3.6 Purpose of Mixed Methods in the Context of Current Study

The aim of this study is to determine the gaps in adolescent sexual education in Australia and how best to address them when considering their impact on the sexual health of Australian adolescents. As identified earlier in this chapter, in order to meet the standards for best practice in health research, it is recommended that utilising more than one methodology will allow a broader scope for addressing a research problem or question, such as the one highlighted above (Creswell, Klassen, Plano Clark, & Smith, 2011). In addition, it has been argued that one of the key components to undertaking and designing research which utilises both qualitative and quantitative methods is the rationale or purpose of the design (Creswell & Plano Clark, 2011). In view of these recommendations, the present study uses a design based on the underlying rationale by Greene et al. (1989), specifically based on the purpose of complementarity/elaboration and expansion (see Figure 3.1).

In thinking about mixed methods research, Creswell et al. (2003) placed strong emphasis on the benefits of considering these designs as a framework for one’s study - to be used in conjunction with three additional dimensions. These involve: determining the priority of each method (i.e. equal priority, quantitative priority or qualitative priority); the timing of the interaction (i.e. concurrent, sequential, or multiphase combination); and, the level of interaction (i.e. where and how to mix) (Creswell et al., 2003; Leech & Onwuegbuzie, 2009).

The methods employed for this present study have been undertaken sequentially, i.e. a quantitative questionnaire of participants’ sexual knowledge to identify a sample who have poor sexual knowledge, and in-depth interviews or focus groups to explore their experiences of sexual education. A qualitative interview has been used to ascertain the
level of interest and understanding, as well as the influences on their sexual education, providing context with a questionnaire measuring the nature and perceived ranking of their sexual education understanding, comparative to their peers (Creswell & Plano Clark, 2011; Greene et al., 1989). Figure 3.1 provides a summary of the mixed methods design selection approach and reasoning for this thesis.

3.6.1 Measures

The instruments used within this thesis include the Sexual Knowledge, Attitudes Test for Adolescents (SKAT-A) (Fullard, Scheier, & Lief, 2005) (see Appendix E). The reliability and validity of this scale are covered in subsequent chapters of this thesis. The decision to use this particular scale was based on a review of the critical literature, followed by a general review of databases to establish appropriate scales for determining sexual knowledge and behaviour of adolescents. Once selected, we consulted with key clinical stakeholders within the field to ensure further its suitability for an Australian, adolescent population. The questions for the qualitative component of the mixed methods design, were based on the purpose of allowing us to expand upon and to provide complementarity with the quantitative data.
3.7 Chapter Summary

In sum, this chapter provides an examination of the use of mixed methods research within the context of this thesis. The findings highlight important advantages of using a mixed methods approach. In particular, it allows for a broader scope in addressing research questions, than a singular method might provide. It is also considered best practice when undertaking health research, provided there is a clear rationale for both the approach and the design. Thus, a mixed methods approach, underpinned by pragmatism, and the importance of expanding and extending the findings of the methods, are utilised in addressing the aims of this thesis.
4 CHAPTER FOUR: THEORY

This chapter discusses theoretical frameworks as they pertain to sexual health behaviour. It begins by examining risky behaviour associated with adolescents both as a specific population, and adolescence as a time of transitional behaviours, thus providing context for our study. The chapter then explores some of the theoretical frameworks used in the sexual health research field, before giving an overview of the theoretical frameworks commonly used within sexual health behaviour and education, thus providing a rationale for the use of the chosen theoretical framework for this study.

4.1 Theory in the Context of this Thesis

4.1.1 Adolescents and risky behaviour

Adolescence is a unique time in terms of development. It marks the period of transition between leaving childhood and the progression towards adulthood. As such, adolescents are faced with a range of biopsychosocial changes that are specific only to this developmental phase. Adolescence often coincides with the onset of puberty, a biological process driven by increases in hormones (such as adrenal and gonadal), leading to both physical changes (i.e. the development of secondary sex characteristics) and increased emotional volatility. In addition, these changes typically co-occur with socio-environmental factors, such as a decrease in time spent with parents, more time spent with peers, changes to the school environment (i.e. transitioning from primary to high school), and an increase in independence (Jaworska & MacQueen, 2015). It is because of this combination of changes that this period is associated with a considerable increase in risk for adolescents, both physically and psychologically. This risk is increased due to adolescents being more likely to engage in behaviours that are inherently hazardous, with the potential for negative outcomes. These include behaviours such as smoking, drinking and substance use, risky driving (including speeding, driving when fatigued, and driving under the influence of alcohol or other drugs, and engaging in risky sexual activity) (Jessor, 1987).

While noting the negative psychological and social consequences of adolescent risk-taking behaviour, the impacts of the physical outcomes (i.e. permanent physical injury or death) are significant. As an example of such impacts of risky behaviour, in Australia, between 2010-2012, the leading causes of death among young people (aged 15-24) were, and still are, considered potentially avoidable (AIHW, 2015). Of these
deaths, one quarter were the result of land transport accidents (25.3%). Of the total number of these deaths between 2010-2012 (4,342), adolescents (10-19 years of age) accounted for 494 fatalities (AIHW, 2015). Another 5.1% of deaths in the 15-24 age group resulted from accidental poisoning, which includes drug overdoses from substances such as alcohol, sedatives, psychotropic drugs and narcotics (AIHW, 2015). According to an ABS report (2008) between 2005-06, across all age groups, male and female adolescents (15-19 years) had the highest rates for hospital admission for acute intoxication from alcohol (124 and 126 per 100,000 respectively). In the same period, female adolescents had the highest drug-related hospital admissions (523 per 100,000), reflecting the high rates of drug-related, intentional self-harm (294 per 100,00) for young women aged 15-24 years (Australian Social Trends, ABS, 2008). A report from the National Health and Medical Research Council (NHMRC, 2014), found that alcohol accounts for 13% of all deaths among 14-17 year olds, and it estimated that each week one adolescent dies and more than 60 are hospitalised from alcohol-related causes. Furthermore, it was found that alcohol contributed to the three major causes of teenage deaths, which are: injury, homicide and suicide (NHMRC, 2009).

4.1.2 Adolescents and risk perception

As will be demonstrated later in this chapter, many of the theoretical models targeting health change and risk behaviour focus on the concept of an individual’s judgement regarding their level of risk. Perceived risk is considered to be a key element in the process of explaining behaviour (for example, Theory of Reasoned Action, Fishbein & Ajzen, 1975; Theory of Planned Behaviour, Ajzen, 1985; Health Belief Model, Rosenstock, 1974; Social Cognitive Theory, Bandura, 1994). These theories suggest that an important role in behaviour is centred on a person’s beliefs about the consequences of their actions and their perceived vulnerability to those consequences. As mentioned in the introductory chapters of this thesis, adolescents are more likely to engage in risky or potentially harmful behaviours than adults. This suggests that adolescents’ beliefs about the consequences of their actions, and their perceived vulnerability to risk, may be skewed.

Cauffman, Steinberg & Woolard (2002) undertook a study that examined the differences in risk-taking perceptions within a group of adolescents and young adults aged 11 to 24. The participants were asked to evaluate the riskiness, potential
harmfulness, relative costs and dangerousness of each of a series of legitimately risky activities, including shoplifting, riding in a car with a drunk driver, or having unprotected sex. The study found that 11-13 year olds were more likely to perceive such activities as more risky, dangerous and with greater potential for harm than any other age group. Individuals from the age of 14, however, demonstrated no difference in their perception of risk compared to people ten years older.

Similarly, Millstein and Halpern-Felsher’s (2002) study found a negative relationship between age and feelings of vulnerability to risks associated with both sex and alcohol. Younger adolescents’ perceptions of vulnerability to STIs from unprotected sex and alcohol induced illness were higher than those of older adolescents and adults. This indicates that, although adolescents do perceive some level of vulnerability to negative outcomes from risky behaviour, this may diminish as they become older. This suggests that adolescents’ thinking may be in line with a more adult approach to thinking. The issue here is the key differences between adolescents and adults, such as cognitive capacity, executive function, planning, impulsivity, experimentation and curiosity, peer pressure and the need for acceptance. These differences mean that adults are less likely to engage in risky behaviour compared to adolescents, because perceived risk for adults is more in line with their actual level of risk. Furthermore, children or younger adolescents may perceive a greater level of vulnerability to adverse consequences in risky situations arising from a lack of exposure, or less understanding, about the nature of the risks. Thus, their perception of vulnerability may stem from a fear of the unknown. As a result, intervention programs targeting adolescents place a strong emphasis on attempting to help adolescents identify their own vulnerability to the adverse consequences of risky behaviours (Millstein & Halpern-Felsher).

According to Steinberg (2004), differences in cognitive processes that are relevant to risk taking and decision making indicate that the increased susceptibility to engaging in risk taking behaviour based on age differences is related to psychosocial factors that impact self-regulation, rather than the perception or evaluation of risk. Steinberg highlights that there is a disconnect between the desire for sensation seeking, which increases substantially at the time of puberty, and the improvement in the ability to self-regulate, something that does not mature fully until early adulthood. As with many interventions targeting changes in behaviour, the focus has been on changing
adolescents’ perception and evaluation, or understanding of risk. Steinberg argues that, given adolescents are fundamentally more likely to take risks than adults, the focus should be on reducing the harm associated with risk-taking behaviour.

The following section discusses models and frameworks that have been used specifically in the field of sexual health, behaviour and education research.

4.2 Theoretical Frameworks for Understanding Sexual Behaviour
Whilst several frameworks addressing sexual behaviour exist, the purpose of this thesis is to determine a framework that most accurately reflects our area of research. As such, this thesis examines models based on the most current data available within the field of sexual health behaviour research. Specifically, it looks at models that address sexual health behaviours such as condom use, STI testing and papsmear screening.

4.2.1 Condom use
A study by Reid and Aiken (2011) utilised five health behaviour models to determine the strongest long term predictors of condom use amongst young women (including adolescents) with steady versus casual partners (mean age across groups 18-19 years). Across two time points, 8 weeks apart, direct and indirect predictors of condom use were found to be consistent and included factors from four of the five behaviour models. These four models and their predictors were: information components from the information-motivation-behaviour (IMB) model; perceived susceptibility, benefits, and barriers from the Health Belief Model (HBM); self-evaluative expectancies from Social Cognitive Theory (SCT); and, partner norm and attitudes from the Theory of Planned Behaviour (TPB). In addition, direct predictors of condom use were found to vary with relationship status. Specifically, condom use for young women with a steady partner was statistically significantly predicted by partner norm and attitude, while self-efficacy statistically significantly predicted condom use for young women with causal partners.

In a related study, Espada, Morales, Guillén-Riquelme, Ballester-Arnal and Orgiles (2016) used structural equation modelling to test three health behaviour models’ ability to predict future condom use (FCU) in adolescents. The study examined the TPB, SCT and the IMB models and found that, statistically, the TPB was the best-fit model for predicting FCU amongst adolescents. According to the results based on the TPB, the best predictor of FCU was condom use intention, which was predicted by both
subjective norms related to condom use and attitudes toward condom use. The study also found that, despite the TPB producing the best-fit, each of the models demonstrated key, direct predictors of future condom use. For example, according to the IMB model, behaviour through motivation is predicted by behavioural skills, while SCT found that knowledge about condom use and STIs and self-efficacy of condom use also predicted FCU.

In order to provide a comparison of the findings, Table 4.1 highlights the common, key predictors of condom use between the two studies examined.

Table 4.1

<table>
<thead>
<tr>
<th>Study</th>
<th>Model</th>
<th>HBM</th>
<th>IMB</th>
<th>SCT</th>
<th>TPB</th>
<th>TRA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>benefits, barriers</td>
<td></td>
<td></td>
<td></td>
<td>No factors identified</td>
</tr>
<tr>
<td>Espada et al. (2015)</td>
<td>NA*</td>
<td>- behavioural skills</td>
<td>- self-efficacy</td>
<td>- knowledge</td>
<td>- attitudes</td>
<td>- Peer norms</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- intention</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indicates that a particular model was not examined in the specific study

4.2.2 STI testing

De Visser and O’Neil (2013) undertook a mixed methods study to identify factors that influence STI testing behaviours within a group of 275 young people aged 17 to 25 years. Participants completed a questionnaire in order to examine a number of variables based on the TPB model, such as attitudes towards sexual health clinics, injunctive or moral norms (i.e. deciding whether to undergo testing based on other’s wishes – will the behaviour be approved or disapproved of by a given group or individual?), descriptive norms, perceived behavioural control, perceived susceptibility to STIs, perceived severity of STIs, STI knowledge and stigma, and willingness to disclose sexual histories. Results of the study found that both descriptive and injunctive norms, as well as shame related to STIs, were predictive of past testing behaviour. It also found that a greater level of perceived susceptibility, previous testing, stronger injunctive norms and a greater willingness to disclose sexual histories were predictors of intention to undergo testing. Quantitative data was then followed up by semi-structured interviews and the
analysis produced four key themes: perceived risk, subjective norms, stigma/shame, and ease of access. The analysis highlighted that each of these themes had an influence on participants’ STI testing behaviour. In addition, perceived risk and perceived norms echoed the questionnaire data, providing further support for their influence on intended testing behaviours.

4.2.3 Cervical cancer screening

In determining predictors of intentions to engage in cervical cancer screening, Duffett-Leger, Letourneau and Croll (2008) undertook a correlational study with a sample of women 25 years or younger ($M = 20.7$ years). A total of 904 participants completed an online, structured questionnaire in order to examine variables relevant to the TPB model, such as knowledge, attitudes, subjective norms, perceived behavioural control and intentions toward cervical cancer screening. Descriptive, correlational and logistic regression analyses indicated two variables from the TPB model as being statistically significantly related to participants’ intentions to undertake cervical cancer screening. These were: perceived behavioural control (i.e. their perceptions of either barriers or personal resources regarding pap tests), and social norms (i.e. perceptions about the importance of papscreening by the people close to them).

4.3 Theoretical Models

Many different theoretical models have been developed over the years in relation to the field of health behaviour and health education. Glanz, Rimer, & Viswanath (2015) note that, within the field of health promotion and education, there is no single conceptual framework or theory that is dominant. Rather, there are a large variety of theories to choose from, with some models explaining specific behaviours better than others, particularly health- related behaviours. As scientific research can be approached from more than one angle, this variety can often make it difficult to ensure an appropriate theoretical model is chosen (Painter, 2008). Choosing the most suitable theoretical model requires recognising the problem and goal, and working backwards to identify possible solutions.

This section outlines several of the more common theoretical models used within the realm of health behaviour and education, before providing a critical appraisal of their potential use within the context of this thesis. These models were selected based on a synthesis of several comprehensive reviews that examined the use of theories for
behaviour change in relation to specific areas of sexual health behaviour (Angus, Cairns, Purves, Bryce, MacDonald & Gordon, 2013; Davis, Campbell, Hildon, Hobbs & Michie, 2015; Lopez, Grey, Chen, Tolley & Stockton, 2016; Shepherd, Frampton & Harris, 2011), as well as those identified in the systematic review for this thesis. The five models/theories discussed below are: Social Cognitive Theory, the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour and the Integrated Behaviour Model.

4.3.1 Social Cognitive Theory

The Social Cognitive Theory (SCT) model of predicting behaviour is triadic in nature and considers that behaviour, personal cognitive factors and socioenvironmental influences mutually interact. This is referred to as reciprocal determinism, that is a unique combination of these factors will influence one’s behaviour (Bandura, 2004; Kelder, Hoelsher & Perry, 2015). Each of the three factors is underpinned by several core constructs, summarised in Table 4.2 (see Kelder, Hoelsher & Perry, 2015 for a more detailed explanation of these constructs).

<table>
<thead>
<tr>
<th>Personal Cognitive Influences</th>
<th>Socioenvironmental Influences</th>
<th>Behavioural Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-efficacy</td>
<td>Observational learning</td>
<td>Behavioural skills</td>
</tr>
<tr>
<td>Collective efficacy</td>
<td>Normative beliefs</td>
<td>Intentions</td>
</tr>
<tr>
<td>Outcome expectations</td>
<td>Social support</td>
<td>Reinforcement &amp; punishment</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Barriers and opportunities</td>
<td></td>
</tr>
</tbody>
</table>

4.3.2 Health Belief Model

The Health Belief Model (HBM) has remained one of the most common and widely used theoretical frameworks within the research field of health behaviour since the 1950s. It is used as both a framework for health behaviour interventions, as well as to explain the change and maintenance of health-related behaviours. Additionally, compared to other frameworks, the HBM has been expanded, and used to support interventions to change health behaviour, such as quitting smoking, managing diabetes,
and increasing the uptake of health screening and vaccinations (Skinner, Tiro & Champion; 2015). The HBM comprises six key constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy (see Figure 4.1). These concepts are used within the HBM to predict why someone will act to avoid, screen for, or control conditions of illness. A key assumption of the HBM is that, for interventions to be effective, they must address an individual’s beliefs regarding specific health behaviours.

![Figure 4.1 Health Belief Model](Skinner, Tiro & Champion, 2015, p.79)

### 4.3.3 Theory of Reasoned Action

The Theory of reasoned action (TRA) focuses on the intention to behave in a particular way in specific situations, rather than focusing on the actual outcome i.e. whether or not the individual follows through with that intent. The TRA aims to explain this intent by examining the individual’s attitudes towards the behaviour, as well as the subjective norms that may influence those behaviours (see Figure 4.2 below) (Montaño & Kaspzyk, 2008).
4.3.4 Theory of Planned Behaviour

The Theory of planned behaviour (TPB) extends the TRA, with the addition of the construct of: perceived control over (performance of behaviour). As with the TRA, the TPB focuses on the concepts of subjective norms, attitudes and perceived control as helping to explain behavioural intention and to predict different behaviours, particularly health behaviours. As shown in Figure 4.2 above, the addition of perceived control to the model for the TRA exemplifies the TPB model (Montaño & Kaspzyk, 2008).

4.3.5 Integrated Behaviour Model

The Integrated Behaviour Model (IBM) is an extension of both the TRA and TPB. It was developed to take into consideration the similar and often complementary constructs used across several behavioural theories and models. It also considers the differences between the models. According to proponents of the IBM, this framework allows for an integration of constructs considered relevant, based on previous behaviour change research (Montaño & Kaspzyk, 2008). As with the TRA/TPB models, intention to perform the behaviour is considered the most important determinant of behaviour. It
then takes into consideration four additional components that directly affect behaviour. The first three are: knowledge and skills to perform the behaviour in question; the behaviour must be salient to the person; and there should not be any, or only minimal environmental constraints that make performing the behaviour difficult or unfeasible (see Figure 4.3). The fourth component considers habit, reflecting the idea that the more experience in carrying out the behaviour a person has, the more likely it is to become habitual, thereby reducing the relative importance of intention. Therefore, the IBM considers that a particular behaviour is most likely to take place when: an individual has a strong intention to achieve it and the knowledge and skill required to do so; there are no significant environmental constraints that may prevent performing the behaviour; the behaviour is salient; and, the individual has previously performed the behaviour. Figure 4.3 below is a diagram of the IBM, demonstrating the integration of key constructs from the TRA/TPB, as well as other influential theories, such as the HBM and SCT (Montaño & Kaspzyk).

![Figure 4.3 Integrated Behaviour Model](chart.png)

*Figure 4.3 Integrated Behaviour Model (Montaño & Kaspzyk, 2008, p.77)*

Table 4.3 provides a summary of the key constructs used by the behaviour models above. It demonstrates the considerable overlap in the concepts used by each of the five models/theories.
Table 4.3

<table>
<thead>
<tr>
<th>Model</th>
<th>Perceived barriers</th>
<th>Perceived risk</th>
<th>Self-efficacy</th>
<th>Intention (motivation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBM</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>TRA</td>
<td>√</td>
<td>√</td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>TPB</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>IBM</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>SCT</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

4.4 Summary of Models

This chapter highlights that there are a number of theoretical approaches that assist us to understand better and predict sexual health behaviour. As has been identified, the models reviewed have an evidence base within the sexual health literature and they each take into consideration a number of key concepts, such as intention, self-efficacy, perceived barriers and perceived risks. These constructs have been shown to be relevant in both predicting and producing positive behaviour changes regarding areas of health across different populations, such as: physical activity, smoking, and healthy eating, (Glanz, Rimer & Viswanath, 2015; Montaño & Kaspzyk, 2015; Skinner, Tiro & Champion, 2015). For the purpose of this study then, a crucial consideration is the population of focus, namely adolescents. It is argued that the theoretical model selected for this thesis must be applicable to our population. Thus, this discussion considers the appropriateness of some of the common constructs used in the theoretical models presented above, in the context of adolescents.

The models discussed above were initially developed for targeting change based on adult populations. As discussed earlier in this chapter, there are similarities between adolescents and adults when it comes to their perceptions of risk, specifically older adolescents have similar perceptions of their risk of negative outcomes (in relation to risky or dangerous behaviour) as their adult counterparts. Each of the five models consider perceived risk as a key construct in producing behaviour change, however, adolescents’ perceptions of risk have been shown not to align with their actual level of risk, in terms of negative outcomes relating to risky sexual behaviour. This puts into
question the appropriateness of perceived risk as a predictive tool, within a model targeting behaviour change within an adolescent population.

The intention to undertake or plan for a behaviour is another common concept identified across these models. Within each of the models, the intention to behave in a certain way, such as using a condom, is one of the most important factors and often the last stage in the chain of events leading up to producing or completing a behaviour. As mentioned previously, the ability for adolescents to self-regulate is not yet mature as that of an adult, and it is combined with the desire for novelty and sensation-seeking. The result of this disconnect between poor self-regulation and sensation-seeking means that intentions and planning are overridden by a more impulsive response. Again, there is a mismatch within the model, which uses concepts based on the abilities of adults, to target behaviour change in adolescents.

Self-efficacy is also seen as a crucial construct across behaviour change theories and models. Given that adolescence is a substantial time of change (emotionally, physically and socially), it can also bring with it a sense of uncertainty and confusion. Self-efficacy pertains to the beliefs one has about their ability to undertake behaviours in order to succeed in a situation. For many adolescents, the desire to fit in, conform and be liked by peers may affect their level of self-efficacy, particularly if sexual education topics are not addressed properly, or if they are misinformed by unreliable sources. Interestingly, the importance of self-efficacy is that it can be improved and it has been shown to have a positive impact on outcomes, producing larger adjustments in health behaviour than changing perceived severity or perceived likelihood (Sheeran, Harris & Epton, 2014).

The saliency of behaviour has also been identified as an important construct as part of the IBM and, within this model, one that is directly linked to undertaking behaviour (Montaño & Kaspzyk, 2015). In order to be salient, a behaviour must be relevant in terms of interest and importance to a person. A potential issue with salience of a behaviour is, whether it involves using a condom or undertaking a self-breast examination, the behaviour requires the skills to undertake it. If it is the first time the behaviour is occurring, the necessary knowledge or skills to perform the behaviour may not yet be developed, thus the potential is for a lack of perceived control over the ability
to perform the behaviour. Therefore, it is important to ensure that the necessary skills exist to enact behaviours that are salient to an individual.

This section provides a critical examination of the key constructs used by behaviour change models, as they relate to the context of this thesis. Specifically, it seeks to determine the utility of these constructs in consideration of behaviour change as it pertains to the sexual health of adolescents. Based on the above, the final sections of this chapter consider a model of best fit in response to the needs of an adolescent population within the field of sexual health.

4.5 A Model of Best Fit

In the context of the current thesis, the purpose is not to develop a theoretical model, rather to determine which of the available models best aligns with our research. As with any model targeting a change in behaviour, a key consideration is the target group. As already noted, there are different challenges in addressing adolescent needs compared to general adult populations. Three of the fundamental concepts identified in the Integrated Behaviour Model of change are: self-efficacy, knowledge and skills to perform the behaviour, and salience of the behaviour (Montaño & Kaspzyk, 2008, 2015). Given the importance of the link highlighted between intention and behaviour, and the concern with factors such as perceived risk, which may not be as relevant in changing behaviour for adolescents (as it would with adults), it is proposed that the IBM be considered as a model of best fit. Fundamentally, it takes into consideration key factors that can be improved in a practical sense, such as increasing self-efficacy, enhancing knowledge and skills (e.g. where and how often to get tested for STIs, how to discuss the use of contraception/condoms with a partner), while also considering the importance of salience of behaviour.

4.6 Chapter Summary

In sum, how health models have evolved over time is very much dependent upon the type of health behaviour in question. Selecting the appropriate theoretical model is not always a straightforward task and the most relevant may be dependent on a variety of factors, such as the population in question and their targeted behaviours for change. In predicting and/or targeting sexual behaviour change, the field of sexual behaviour research does not consistently adopt one model over another. Research highlights the utility of evaluating individual constructs, noting that combining constructs in a careful
and considered way may improve the efficacy of an intervention, over one developed on the foundation of a single theory. This chapter has identified some of the key and most widely used models developed to identify and change health behaviours, but more specifically, it has highlighted the overlap of key constructs across models and considered the relevance of the constructs in the context of the current thesis.
CHAPTER FIVE: STUDY ONE

Adolescent sexual behaviour, knowledge and education

5.1 Introduction
The first study within this thesis aims to address findings of the initial systematic review which clearly highlighted two things. Firstly, concerns about the current sexual health of adolescents in Australia and, secondly, the widening gap in addressing this issue through measures such as sexual education. Specifically, despite the clear evidence of an increase in risky sexual practices amongst adolescents, such as an increase in STIs and the high rate of unplanned pregnancies (ABS, 2012; Tran, Druce, Kelly, & Birch, 2004), sexual education for this population has been poorly addressed and the effectiveness of different interventions and strategies has been poorly monitored. The review also found that adolescents are continuing to engage in unsafe sexual practices such as inconsistent use of condoms and other contraceptive methods, younger age at first intercourse and more sexual partners (Agius, Dyson, Pitts, Mitchell, & Smith, 2006; Kang, Skinner, & Foran, 2007; Rissel et al., 2014; Smith, Agius, Mitchell, Barrett, & Pitts, 2009). Furthermore, it identified inconclusive impacts of sexual education on the sexual knowledge of adolescents. In particular, the findings of key papers indicated that improvements in sexual knowledge had not been seen to produce a corresponding improvement in risky sexual behaviour (Giordano & Ross, 2012). Finally, it indicated that evidence of the effects of sexual education on sexual knowledge and behaviour is inconsistent (Agius, Pitts, Smith, & Mitchell, 2010; Kirby, Laris, & Rolleri, 2007; Lou & Chen, 2009; Oakley et al., 1995).

To reiterate, sexual education encompasses a range of modalities and can broadly be separated into two categories: formal and informal. Formal sexual education refers to information or programs provided by healthcare professionals such as GPs or nurses, and in settings such as sexual health clinics, or through other trained educators via school-based programs. Informal sexual education refers to sources such as: family, peers, and all forms of media, including online and print. It is these sources that provide the information relating to the many key elements that contribute to encapsulating the complexity of sexual knowledge. Sexual intercourse, sexual health, relationships, biology, contraception, gender, and identity are just some of these important topics that contribute to this area. A key aim of sexual education is to ensure an appropriate level
of sexual knowledge is received in order for informed choices to be made. Over time, however, the environment in which adolescents both access and engage with this information has changed. In order to determine whether the information being accessed by adolescents is appropriate, it is necessary to examine whether this change in environment has been matched by an appropriate shift in the way sexual education is delivered and/or received.

Research undertaken in other Westernised cultures highlights that young people are dissatisfied with the quality of formal sexual education they receive (Giordano & Ross, 2012; see Pound, Langford & Campbell, 2016 for a detailed review of this topic). Specific concerns note that sexual education in schools does not address all of the appropriate topics available and that it is poorly delivered. Key papers indicate that the importance of sources of sexual education for adolescents have changed, turning toward those that are more accessible and salient for the adolescent, such as media, the internet and friends or peers (Evers, Albury, Byron & Crawford, 2013; Giordano & Ross; Sprecher, Harris & Myers, 2008). Studies examining the impact of sexual education draw attention to important gaps in the research, in particular the lack of recent research investigating the effectiveness of sexual education based on factors such as the specific source and the amount (i.e. number of hours), as opposed to the evaluation of individual programs.

As discussed, the role that sexual education plays in providing and enhancing sexual knowledge amongst adolescents has been highlighted as crucial. Thus, it is important to consider the link that may exist between an improvement in sexual knowledge and a reduction in risky sexual behaviour. Risky sexual behaviour includes engaging in sexual activities, such as oral sex or vaginal/anal intercourse (specifically, age of initiation and/or frequency), more sexual partners, not using condoms or other contraceptive methods, and lack of STI testing (Kirby, 2011). These risky behaviours put adolescents at an increased risk of physical consequences, such as contracting STIs and unplanned pregnancy (Scott, Wildsmith, Welti, Ryan, Schelar & Steward-Streng, 2011). It also puts them at increased risk of negative emotional consequences, such as distorted self-esteem, depression and anxiety and difficulty in forming healthy long-term relationships (Malhotra, 2008). Yet, despite sexual education and sexual knowledge being implicated as playing a key role in changing risky sexual practices amongst adolescents, the
evidence of its impact remains unclear and must be appropriately addressed (Giordano & Ross; Kirby).

Developing an understanding of the characteristics of the current adolescent population, regarding their sexual behaviour, knowledge and education is vital. Therefore, an overarching aim of this study is to determine the current demographic and lifestyle factors of adolescents in an Australian context. More specifically, this study will examine the relationships between the sexual knowledge of adolescents, risky sexual behaviour and the type and amount of sexual education received. It is hoped that the findings of this study will increase the understanding of what is required for effective sexual education.

For the purpose of this paper, type of sexual education refers to both formal and informal methods, as described in the introduction. It is hoped that by investigating these factors and their utility with regard to sexual education, this will in turn lead to the development of better prevention and intervention programs and, hence, more positive outcomes for adolescents’ sexual health and wellbeing.

5.2  Research questions:

In order to address the above aims, four specific questions were considered:

1) What are the sexual experiences and behaviours of Australian adolescents?
2) What are the contributing factors to age of first sexual intercourse?
3) Does the number of completed hours or type of sexual education received have a significant impact on sexual knowledge?
4) Is there a relationship between level of sexual knowledge and sexual behaviour?

Based on the above research questions, and in conjunction with past research, several hypotheses were made.

It is hypothesised that:

1) The level of sexual knowledge, having previously attended a sexual health clinic and age of first oral sex will contribute to age of first sexual intercourse.
2) A greater number of hours of sexual education received will be positively associated with sexual knowledge.
3) Formal sexual education will be positively associated with sexual knowledge and informal sexual education will be negatively associated with sexual knowledge.

4) Higher scores on the sexual knowledge scale will be positively correlated with fewer sexual risk behaviours.

5.3 Method

5.3.1 Participants

The sample consisted of eighty-three Australian adolescents (9 males and 74 females) ranging in age from 15-19 years of age ($M = 17.76$ years) who were either attending a sexual health clinic in Victoria or the Northern Territory, or completed the questionnaire via an online link. The majority of the sample identified their ethnic background across three main groups: Anglo/Australian (47%), European (18.1%), and Asian-decent (16.9%). The majority of participants were either currently attending university (31.3%) or in year 12 (24.1%) and presently living at home with at least one parent (80.7%).

5.3.2 Design

The study utilised a cross-sectional survey design to collect quantitative data.

5.3.3 Measures

This study uses the Sexual Knowledge and Attitude Test for Adolescents (SKAT-A). It is a revised version of the SKAT and was developed in the United States by Fullard, Lief and Scheier (2005). The SKAT was originally designed for use with adult health professionals. This was then used as a basis for developing and constructing scales for the SKAT-A. The SKAT-A provided an adolescent focused questionnaire and was designed to be used with 12-18 year olds, however it is also suitable for use with young adults. The most recent version of the SKAT-A added a section for demographic data for potential use in settings including sexuality education, program evaluation and a method of collecting important information about adolescent sexuality. The full SKAT-A is available, by request, from LARS Research Institute, Inc. (www.larsri.org).

The SKAT-A consists of a series of questions relating to demographic information, including age, postcode, and current year in school, as well as ethnicity, religious background, importance of religion and with whom the participant currently resides.
includes a section on knowledge of sexual health information, consisting of 41 items that are scored trichotomously (True, False, and Not Sure). Scale scores are obtained by subtracting number of incorrect answers from the number of correct answers (1 = correct, 0 = incorrect); the response Not Sure is also scored as 0. The knowledge section assesses six areas of sexuality knowledge: contraception and pregnancy, abstinence and sexual awareness, orgasm, masturbation, negative consequences of sex, and LGBT knowledge (see Appendix E). As sampling of the SKAT-A is based on an American population, a number of questions were adapted to ensure suitability for an Australian sample, for example, adjustment of some specific terms used and questions specifically referring to “America”. According to Fullard, Johnston and Lief (1998) the knowledge scale of the SKAT-A has good internal consistency with a Cronbach alpha coefficient reported of .79 and test-retest stability over a two-week period (coefficient of .78), using a high school sample. In the current study the Cronbach alpha coefficient was .79.

The Sexual Behaviour Inventory seeks information regarding a wide range of sexual and experiential behaviours. Given a focus of this study relates to sexual education, additional background questions were added to this section, for example, where/whom the participant had received sexuality education from and an estimate of hours of formal and informal sexuality education received in the past 12 months. The timeframe of the past 12 months was chosen in consideration of the fact that adolescents would not likely be able to recall a specific number of hours of sexual education received, over a broader context. Thus, participants were asked to identify the approximate number of hours via prompts. That is, number of hours were divided into three categories (5hrs; 10-15hrs; >15hrs) and participants asked to select which was relevant to them, for both formal and informal sexual education (see Appendix E).

5.4 Procedure

Recruitment took place in two stages. The first was across two sites within Australia (Victoria and the Northern Territory) – both community sexual health clinics that provide a service to adolescents and young adults up to 25 years of age. The clinics are independent, not for profit organisations and are provided partial funding via the government, as well as revenue generated through fee based education and training programs and the sale of resources. Adolescents were invited to participate in the study if they were between 16-19 years of age. Posters advertising the study were placed in
the clinic waiting rooms, and prior to attending their consultation, clinic staff identified whether those attending the clinic fit the criteria to participate. If adolescents were eligible to participate they were provided with a brief description of the study and the process involved. Participants were able to make an informed decision by reading the plain language statement and consent form. Consenting participants placed completed questionnaires in a sealed envelope, within a locked tub, which was kept within the waiting room, as per ethical approval. The second stage of recruitment was via an online link to the questionnaire. Participants were invited to participate based on the same criteria, via online advertising through an Australian university, as well as through social media. Ethics approval was granted by the Human Research Ethics Committee at Deakin University. Completed, hard copy questionnaires were collected at regular intervals and stored, as per ethical guidelines, within a locked filing cabinet. Online questionnaires and all data was entered into SPSS and stored within a locked file. Any participants experiencing distress in response to completing the questionnaire were directed to clinic staff or specified support/helplines.

5.4.1 Data Analysis

All analyses were conducted using SPSS versions 23 and 24 (IBM Corp., 2015). The data were entered into SPSS by hand before conducting screening and cleaning techniques to check for missing data or errors. Descriptive statistics analyses were then run to determine key sample characteristics. Checks for the violation of assumptions for each of the planned analyses were also run and are summarised in the results.

5.5 Results

It should be noted that not all sections of the questionnaire were consistently completed by all participants. Therefore, the total number of participants for each analysis may vary and this will be highlighted for each analysis. No consistent pattern of unanswered questions was identified but, for the knowledge section, cases with missing data were excluded to ensure only cases with a total knowledge score were included in the analyses with this variable.

5.5.1 Demographic characteristics of adolescents

Preliminary analyses were undertaken in the form of descriptive and frequencies tests to determine several key demographic characteristics. Table 5.1 provides demographic
information, including age, ethnicity, current living situation and the importance of religion.

Table 5.1  
**Demographic characteristics of adolescents**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>17.76 (1.07)</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Ethnicity:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anglo-Saxon/Australian</td>
<td>39</td>
<td></td>
<td>47%</td>
</tr>
<tr>
<td>European</td>
<td>15</td>
<td></td>
<td>18.1%</td>
</tr>
<tr>
<td>Asian-descent</td>
<td>14</td>
<td></td>
<td>16.9%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td></td>
<td>8.4%</td>
</tr>
<tr>
<td>Middle Eastern</td>
<td>2</td>
<td></td>
<td>2.4%</td>
</tr>
<tr>
<td>Aboriginal or Torres Strait Islander</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>(Did Not Answer)</td>
<td>5</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Living situation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At home with both parents</td>
<td>41</td>
<td></td>
<td>49.4%</td>
</tr>
<tr>
<td>Mother or father only</td>
<td>20</td>
<td></td>
<td>24.1%</td>
</tr>
<tr>
<td>Mother &amp; Stepfather</td>
<td>4</td>
<td></td>
<td>4.8%</td>
</tr>
<tr>
<td>Stepfather</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>Split between 2 families</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>Sibling only</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>Friends/housemates or alone</td>
<td>10</td>
<td></td>
<td>12%</td>
</tr>
<tr>
<td>Partner</td>
<td>3</td>
<td></td>
<td>3.6%</td>
</tr>
<tr>
<td>Youth refuge</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>(Did Not Answer)</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Of the 67 ppts living with at least one parent, 46 also lived with at least one other sibling.

Current level of Education:

<table>
<thead>
<tr>
<th>Year</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 9</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>Year 10</td>
<td>7</td>
<td></td>
<td>8.4%</td>
</tr>
<tr>
<td>Year 11</td>
<td>5</td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Year 12</td>
<td>20</td>
<td></td>
<td>24.1%</td>
</tr>
<tr>
<td>Completed high school</td>
<td>11</td>
<td></td>
<td>13.3%</td>
</tr>
<tr>
<td>Attending TAFE</td>
<td>7</td>
<td></td>
<td>8.4%</td>
</tr>
<tr>
<td>Attending University</td>
<td>26</td>
<td></td>
<td>31.3%</td>
</tr>
<tr>
<td>Left high school:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>in Year 10</td>
<td>4</td>
<td></td>
<td>4.8%</td>
</tr>
<tr>
<td>in Year 11</td>
<td>2</td>
<td></td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Importance of religion:

<table>
<thead>
<tr>
<th>Importance of religion</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not very important</td>
<td>61</td>
<td></td>
<td>73.5%</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>21</td>
<td></td>
<td>25.3%</td>
</tr>
<tr>
<td>(Did not answer)</td>
<td>1</td>
<td></td>
<td>1.2%</td>
</tr>
</tbody>
</table>
5.5.2 Research Question 1: What are the sexual experiences and behaviours of Australian adolescents?

Table 5.2 (below) presents the results of descriptive and frequency analyses that relates to specific sexual experiences and behaviours of participants. These include previous attendance at a sexual health clinic for sexual health purposes, age at first sexual intercourse, age at first oral sex, number of sexual partners and having ever experienced unwanted sexual intercourse.

Table 5.2

Descriptive information relating to sexual health and behaviour experiences

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>N</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever visited a sexual health clinic regarding sexual health before:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54</td>
<td>65.1%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>27</td>
<td>32.5%</td>
<td></td>
</tr>
<tr>
<td>Did Not Answer /Missing</td>
<td>2</td>
<td>2.4%</td>
<td></td>
</tr>
<tr>
<td>Ever had sexual intercourse (oral/vaginal/anal):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74</td>
<td>89.2%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>10.8%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>83</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Age at first oral sex</td>
<td>15.71 (1.54)</td>
<td>62*</td>
<td></td>
</tr>
<tr>
<td>No. oral sexual partners:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3months</td>
<td>1.28 (.99)</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>≤ 12months</td>
<td>2.32 (2.14)</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td>4.21 (4.53)</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Age at first penetrative sex**</td>
<td>15.92 (1.48)</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>No. sexual partners (vaginal or anal):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 3months</td>
<td>1.54 (1.31)</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>≤ 12months</td>
<td>2.65 (2.82)</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Lifetime</td>
<td>4.97 (7.05)</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>Ever experienced unwanted sexual intercourse:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27</td>
<td>36.5%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>56.6%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

*8 pts did not provide age of first oral sex experience but did provide number of oral sex partners
**Penetrative sex was defined as vaginal or anal sexual intercourse
5.5.3 Research Question 2: What are the contributing factors to age of first sexual intercourse?

A standard multiple regression analysis was calculated to test if age of first oral sex, knowledge score, or having attended a clinic for sexual health reasons, statistically significantly predicted participants' age at first sexual intercourse. Preliminary analyses were performed to check assumptions of multicollinearity (using tolerance and VIF cut-off points), normality, linearity, homoscedacity and independence of residuals. No violation of assumptions was found. Using the enter method it was found that one of the variables explained a statistically significant amount of the variance in age of first sexual intercourse \( F(3, 50) = 29.78, \ p < .001, \ R^2 = .64, \ R^{2\text{Adjusted}} = .62 \). The results of the regression indicated that age of first oral sex statistically significantly predicted age of first sexual intercourse \( (\beta = .80, <.001) \), explaining 62% of the total variance of age at first sexual intercourse.

5.5.4 Sources of sexual education

Table 5.3

<table>
<thead>
<tr>
<th>Source of Education</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Informal</strong></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>63 (75.9)</td>
</tr>
<tr>
<td>Internet</td>
<td>45 (50.7)</td>
</tr>
<tr>
<td>Parents</td>
<td>37 (44.6)</td>
</tr>
<tr>
<td>Books/Magazines</td>
<td>34 (41)</td>
</tr>
<tr>
<td>Movies/Television</td>
<td>33 (39.8)</td>
</tr>
<tr>
<td>Pornography</td>
<td>15 (18)</td>
</tr>
<tr>
<td>Siblings/Other Relatives</td>
<td>10 (12)</td>
</tr>
<tr>
<td><strong>Formal</strong></td>
<td></td>
</tr>
<tr>
<td>Sexual education classes</td>
<td>60 (72.3)</td>
</tr>
<tr>
<td>Doctor</td>
<td>10 (12)</td>
</tr>
</tbody>
</table>

NB: This question was based on a 'tick all that apply' answer

Table 5.3 divides the sexual education sources by type – informal and formal – and these sources are listed from most commonly, to least commonly identified as being utilised by participants. Results show that the most commonly listed sources of informal
sexual education are friends (75.9%), followed by the internet (50.7%), and that the majority of the sample have attended sexual education classes (72%).

Table 5.4

*Hours of sexual education received in the past 12 months: formal and informal categories*

<table>
<thead>
<tr>
<th>Type of education</th>
<th>5 hours (%)</th>
<th>10-15 hours (%)</th>
<th>&gt;15 hours (%)</th>
<th>None (%)</th>
<th>Total* (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal</td>
<td>47 (58)</td>
<td>10 (12.3)</td>
<td>22 (27.2)</td>
<td>2 (2.5)</td>
<td>81 (100)</td>
</tr>
<tr>
<td>Informal</td>
<td>20 (24.7)</td>
<td>24 (29.6)</td>
<td>37 (45.7)</td>
<td>0</td>
<td>81 (100)</td>
</tr>
</tbody>
</table>

*2 participants did not complete this question*

The results of Table 5.4 show the average number of hours of sexual education experienced by participants within the last 12 months. The results are divided into the two overall categories based on type – formal and informal – and then broken into the number of hours across three categories (i.e. 5hrs, 10-15hrs, more than 15hrs). The results show that: within the formal category of education, the majority of participants identified as having received approximately 5 hours of sexual education (58%); and, within the informal category, the majority of participants identified as having received more than 15 hours of sexual education (45.7%).

Table 5.5 provides the range of scores for both the overall knowledge scale scores and the subscale scores, including the means and SDs for each of the subscales. The total possible knowledge score is 41 and, within the sample, the mean overall knowledge score was 25.71 (4.88).
Table 5.5

Range of scores for the 8 subscales and overall score of the knowledge scale

<table>
<thead>
<tr>
<th>Subscale</th>
<th>N</th>
<th>Min. score within sample</th>
<th>Max. score within sample</th>
<th>Max. possible score</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy</td>
<td>82</td>
<td>0</td>
<td>7</td>
<td>7</td>
<td>4.82</td>
<td>1.48</td>
</tr>
<tr>
<td>STI Transmission</td>
<td>82</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>2.26</td>
<td>.56</td>
</tr>
<tr>
<td>Sexual initiation &amp; virginity</td>
<td>83</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>1.48</td>
<td>1.03</td>
</tr>
<tr>
<td>Orgasm/Erection</td>
<td>82</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>4.39</td>
<td>1.25</td>
</tr>
<tr>
<td>Negative consequences/Rape</td>
<td>82</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>3.66</td>
<td>1.25</td>
</tr>
<tr>
<td>Masturbation</td>
<td>83</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4.28</td>
<td>.70</td>
</tr>
<tr>
<td>Homosexuality</td>
<td>82</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>2.45</td>
<td>.88</td>
</tr>
<tr>
<td>Abortion &amp; Education</td>
<td>83</td>
<td>0</td>
<td>4</td>
<td>4</td>
<td>2.37</td>
<td>.91</td>
</tr>
<tr>
<td>Overall Knowledge score</td>
<td>78*</td>
<td>9</td>
<td>33</td>
<td>41</td>
<td>25.71</td>
<td>4.88</td>
</tr>
</tbody>
</table>

NB*: Total sample size is smaller due to missing responses. Only participants with a full set of responses were included in the calculation of overall knowledge score.

Prior to conducting descriptive analyses of the knowledge scale, a reliability analysis was undertaken to ensure that, within the current sample, the scale was measuring what it was reported to measure. Results of the reliability analysis are presented in the method section.

5.5.5 Research Question 3: Does the number of completed hours or type of sexual education received have a significant impact on sexual knowledge?

Two one-way between groups analyses of variance were conducted to explore the impact of hours of sexuality education (formal and informal) on total knowledge scores, as measured by the Sexual Knowledge Scale from the SKAT-A. Subjects were divided into three groups according to the number of hours of sexual education they had reported receiving in the past 12 months (Group 1: 5hrs or less; Group 2: 10-15hrs; Group 3: 15hrs or more). No statistically significant difference on knowledge scores was found between the three groups, for either formal: $F(2, 73) = .13, p = >0.5$, or informal sexual education: $F(2, 73) = 1.7, p = >.05$.

5.5.6 Research Question 4: Is there a relationship between level of sexual knowledge and sexual behaviour?

The relationship between sexual knowledge (as measured by the knowledge scale) and sexual behaviour (as measured by the sexual behaviour inventory) was investigated using the Pearson correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedacity. There
was a small, positive correlation between the two variables, \( r = .25, n = 69, p < .05 \), with high levels of knowledge associated with more proactive sexual behaviours (knowledge helps to explain 6.25% of the variance in respondents’ scores on the behavioural inventory scale).

5.6 Discussion

Ensuring improvement in the sexual health and wellbeing of adolescents is an ongoing challenge in Australia, a challenge with few clear solutions. The situation is complicated by conflicting research data and a dearth of current literature examining the relationships between sexual education, knowledge and behaviours, particularly the way information is accessed and consumed. This study seeks to address some of these gaps. Specifically, this study examines: the demographic characteristics of adolescents, their sexual experiences and behaviours and their experiences of sources of sexual education; the predictors of risky sexual behaviour; whether the number of hours or type of sexual education adolescents received would impact levels of sexual knowledge; and whether there was a relationship between level of sexual knowledge and risky sexual behaviour.

This study highlights key findings regarding the demographic characteristics, and the sexual experiences and behaviours a sample of adolescents. Firstly, it considers the age at first specific sexual experiences, namely, first oral and vaginal intercourse. The results of this study indicate that the average ages for first sexual intercourse and for first oral sex, are not dissimilar to a US sample of adolescents (Halpern & Haydon, 2012). Both in the US and Australia commencement of these behaviours occurred prior to 16 years of age. The US sample shows a slightly younger age at first sexual intercourse compared to the current study (15.5 years vs. 15.9 years respectively). By contrast, the age at first oral-genital intercourse was slightly older in the US sample than in the current study sample (15.8 years vs. 15.7 years respectively).

The findings of this study also highlight a statistically significant rate of sexually active adolescents who have experienced unwanted sex (36.5%), a figure that is higher than that of other research, with reported rates of approximately 25% or 1 in 4 for high school students (Mitchell et al., 2014). Additionally, national findings show that 17.1% of all women in Australia have experienced sexual assault since the age of 15. Moreover, women aged 18-24 are at an increased risk of sexual assault compared to the national average, with 2.2% and 1% respectively having experienced sexual assault in
the 12 months. This demonstrates, that as a population, adolescents and females particularly, are at an increased risk of unwanted sexual experiences or behaviour.

The results of this study highlight several important themes regarding sexual knowledge, sexual behaviour and sexual education for Australian adolescents. The first theme centres on the contributing factors of risky sexual behaviour within this sample. In examining the potential predictors of engaging in risky sexual behaviours, results of the analysis show that age of first oral sex is predictive of age of first sexual intercourse. Specifically, the results indicate that age of first oral sexual encounter, accounts for 62% of the variance in explaining factors contributing to the age of first sexual intercourse. This means that adolescents who have already engaged in oral sex are more likely to then engage in sexual intercourse. These findings are similar to those of Rissel et al. (2014), who used computer-assisted, telephone-based interviews to determine first vaginal and oral sexual experiences of a representative Australian sample. The study interviewed 20,094 adults between 16-69 years of age and found that when the data were broken down into age groups, 16-19 year olds were most likely to report having had oral sex before vaginal intercourse. Although this study is not predictive in nature, it does highlight a trend in adolescent sexual behaviour, for oral sex occurring prior to vaginal intercourse.

By contrast, studies from other developed countries have found that adolescents are engaging in genital intercourse, prior to oral sex. Halpern and Haydon (2012) for example, generated prevalence estimates for the initiation of sexual behaviours for adolescents who had turned 18 years of age by the year 2001 (using data from 13,835 respondents of a US longitudinal study of adolescent health). Results of their study found that, for the respondents who had experienced both vaginal and oral sex, vaginal intercourse was initiated first compared to oral-genital intercourse (33.3% and 17.7%, respectively). The differences in the findings may reflect the fact that the US sample was based on respondents who would have been adolescents during the 1990s, which would not necessarily take into account the shift in adolescent knowledge of, and engagement in, specific sexual practices such as oral sex that have been highlighted as becoming more prevalent over the past decade.

The relationship between age of first oral sex and age of first vaginal intercourse is important, as it highlights that past sexual experiences or behaviours may be a driver of
future sexual experiences or behaviour. That oral sex is taking place at younger ages may suggest that adolescents view this as a less risky behaviour than sexual intercourse, as it avoids the potentially unwanted outcome of pregnancy. It may also suggest that oral sex is an activity that is more common or accepted among adolescents, however, given that oral sex is becoming more prevalent in both the contraction and spread of STIs (such as genital HSV and HPV) it suggests that adolescents may not have the necessary knowledge to protect themselves. Furthermore, given that the average age of first sexual intercourse has already been identified as decreasing (Rissel et al., 2014), these findings suggest that if oral sex occurs first, the age at which adolescents will begin to engage in sexual activity will continue to decrease. This suggestion is consistent with theories on the age of debut of adolescent drinking. Research in this field has indicated that the earlier that the consumption of alcohol onset occurs, the greater the likelihood of heavy alcohol use in the future (Liang & Chikritzhs, 2013; Morean, Corbin & Fromme, 2012). Additional research in this area identifies that delaying the age of the first alcoholic drink will lead to less risky drinking behaviour in the future (Morean, Kong, Camenga, Cavallo, Connell & Krishnan-Sarin, 2014). Considering this research in conjunction with the findings of our study, this indicates that delaying the age at which adolescents engage in sexual behaviour, particularly oral sex, may lead to a delay in the age of first penetrative intercourse while also reducing the immediate risks of contracting STIs associated with oral sex.

The second theme of this research relates to the amount of sexual education that adolescents receive and whether this affects their sexual knowledge. This study examined whether the number of hours or the type of sexual education received was associated with increased levels of sexual knowledge. Results indicate that, regardless of the number of hours they received (<5hrs, 5-10hrs, >15hrs), from either formal or informal sources, there was no statistically significant difference in adolescents’ knowledge scores. Thus, the hypotheses that number of hours of sexual education, or type of sexual education would be associated with level of sexual knowledge were not supported. This lack of impact of sexual education on sexual knowledge may result from the impact of saliency on learning. Specifically, adolescents are only absorbing or paying attention to sexual education that is relevant to them at that time it is being presented to them. The effect of salience of information suggests that adolescents may not require the information at the time they are presented with it, thus the knowledge
doesn’t necessarily ‘stick’. This is not dissimilar to obtaining knowledge that is required for an exam (where testing is required). Individuals may intensively study the relevant material for an exam occurring the next day but the information will not be retained in the long term, as they only feel that it is relevant at that specific point in time. This highlights the importance of the modalities in which education is available to adolescents. In this study, almost 60% of the participants identified having only received 5 hours or less of formal sexual education in the past 12 months. Comparatively, only one quarter of participants identified that same number of hours for informal sexual education, with the majority reporting they had 15 or more hours. Thus, when knowledge is required, it needs to be readily accessible for the adolescent; hence the significant increase in the use of informal methods such as the internet or turning to friends. The use of these methods, while demonstrating resourcefulness of adolescents, highlights an additional issue, namely, the accuracy and reliability of the information they are obtaining.

In sum, two key points are raised in response to these findings. Firstly, that despite the number of hours of formal sexual education received by adolescents, if the timing of the information they receive is not salient to them, it is unlikely it will be retained. Thus, the sexual knowledge of adolescents is not likely to improve. Secondly, salience may also be a key factor with regard to informal sources of sexual education, given that the number of hours of informal sexual education reported by adolescents is considerable and frequently dominates all other information sources. This finding may suggest that adolescents are more likely to seek out information when it is relevant to them and therefore, they opt for sources that are readily accessible, such as friends and the internet, rather than turning to GPs or school based resources. This then leads to the issue of adolescents obtaining information that is potentially inaccurate or biased. The consequences of this are twofold; firstly, adolescents may act based on this information, in ways that are not protective; and secondly, their effective level of sexual knowledge may be compromised.

Given there was no difference found between groups for formal vs informal sexual education, the findings of this study suggest that both may be important in providing appropriate sexual education for adolescents. As formal methods, such as school-based sources, are grounded in a structured approach, targeting each year level with a set
range of topics and learning outcomes, this may disadvantage adolescents who develop more quickly or more slowly. Thus, adolescents need to be equipped with the capability and skill to determine the accuracy of sexual health information if they are accessing it through informal methods.

The third theme relates to the second, as it centres on the sources of sexuality education that adolescents are accessing. Results of this study highlight that the majority of adolescents had experienced school based sexual education (72.3%). This sample is only slightly lower than the sample of Australian high school students assessed by Mitchell and colleagues, who reported that 86% of adolescents had experienced school-based sexual education (Mitchell et al., 2014). In considering the sources of sexual health information most commonly referenced by adolescents (regarding where they learnt about sex/sexual health), the current study found that friends and the internet were the most cited (76% and 50%, respectively). These findings are in line with those of studies of high school student samples from 2008 and 2013, which indicate a statistically significant increase in the tendency for adolescents to seek sexual health information from their friends (54% and 41%, respectively) and the internet (36% and 43%, respectively) (Mitchell et al., Smith et al., 2009). Interestingly, the study in 2008 asked students about their level of trust in the source they cited, with students identifying friends as quite trustworthy (56%) but the internet less so (25%). This is despite over one third of students identifying the internet as a source of sexual health information (Smith et al., 2009). It is concerning to note that adolescents citing school based sexual education programs as a source of sexual education decreased from 49% in 2008 to 42.7% in 2013 (Mitchell et al., Smith et al.). A further finding in examining formal sources of sexual education within the current study shows that the majority of the sample identify that this was neither their first trip to visit a healthcare professional for sexual health issues, or that they had previously visited a healthcare professional regarding their sexual health. Despite this, only 12% of participants identified a doctor/healthcare professional as a source of sexual education. This finding is interesting and consistent with past research which highlights adolescents’ concerns regarding the trustworthiness of the source of their sexual education. While, doctors were considered the most trustworthy of all sources accessed by students, this did not translate into practice, reflected in the relatively low number of students who listed a doctor as an actual source of sexual health information (Smith et al.). This suggests that
more research is required to better understand why such a seemingly trusted and valuable resource is not being routinely accessed by adolescents.

In sum, the findings of the current study are in line with past research, indicating that informal sources of sexual education are the more common method of accessing sexual health information for adolescents. Adolescents report receiving or accessing a greater number of hours of sexual education from informal sources. Again, these findings suggest that more time needs to be given to these methods as they are more salient and important to adolescents when they are seeking sexual health information. At the same time, the study points to addressing valid concerns about the possible negative consequences of information that is easily accessible but lacking in reliability and trustworthiness. These findings warrant further investigation to determine what factors are important to adolescents when accessing sexual health information.

The fourth and final theme of the present study centres on the relationship between sexual knowledge and risky sexual behaviour. The hypothesis that there would be a positive correlation between level of knowledge and less risky sexual behaviours was met but the effect size of this result was small, explaining only 6.25% of the variance. This finding suggests that although there is a small relationship highlighted between sexual knowledge and subsequent risky sexual behaviour, it is not enough to attribute as a statistically significant predictor of improvement in sexual behaviour. Furthermore, increased knowledge may have occurred after already engaging in risky sexual behaviours, thus, biasing the temporal order of any association. As has been highlighted in preceding chapters of this thesis, adolescents are risky and impulsive, and the findings of the present study suggest that adolescents will still behave in risky ways, despite knowledge. This finding is in line with previous research, where the impact of knowledge on behaviour has been inconsistent.

5.7 Limitations
There are several limitations of this study that are noted. Firstly, specific to the sample, is the small sample size and that given recruitment was through both a sexual health clinic and through university, the sample is one of convenience. It is also possible that given the differences in mode of recruitment (online and in-person), there may be a response bias. The age of the sample is also a potential limitation, with the average age greater than 17 years, meaning that data cannot necessarily be generalised to younger
adolescents. Secondly, the reporting of knowledge or the hours of education received may be problematic due to retrospective nature of the question and may have contributed to a lack of statistically significant findings. It was initially proposed to ask participants to specify the total number of hours, however, it was felt that without prompts, the responses would have been over or underestimated, or not answered at all. Furthermore, it is recommended that future research should consider the location and scale of data collection. In this study, the majority of data collected came from a sample of adolescents attending a clinic in inner Melbourne, thus it is not necessarily representative of regional and/or rural areas. Location may also have contributed to limited participation of Native Australians. Finally, the sample from the Northern Territory was too small to make direct comparisons with the Victorian sample.

5.8 Conclusions & Implications
This study highlights the importance of continued research in the area of sexual education within an adolescent population. It both confirms past research, and extends the understanding of several key aspects of adolescents with regard to sexual education, knowledge and behaviour. Specifically, it highlights the increasing trend towards informal sources of sexual health information and the potentially negative impact that this may have on outcomes such as knowledge and subsequent behaviour resulting from valid concerns about the accuracy of informal sources. In considering previous research, the issue of accuracy also emphasises that there may be a part for trustworthiness to play and this deserves further exploration. Although saliency was not directly measured in this study, it also points towards the potential importance of the salience of the information that is being accessed by adolescents, rather than a specific amount of time spent in receiving sexual health information. Finally, it highlights that there may be a trend towards Australian adolescents engaging in oral sex activity at a younger age and that, by doing so, this may lead to initial sexual intercourse at a younger age. These findings have implications not only for future research, but the importance of when and how sexual education is provided.

In sum, this present study provides an update on the current literature and highlights areas that warrant further investigation. As such, the following chapter provides the second study of this thesis, which will expand upon the findings of this study, via qualitative methods.
6 CHAPTER SIX: STUDY TWO

6.1 Introduction

The second study of this thesis was undertaken to follow up, complement and enhance the quantitative findings obtained in Study one. This is in line with the methodological framework recommended by Greene, Caricelli and Grahame (1989) and Greene, Benjamin and Goodyear (2001). Specifically, this study sought to develop a more personal and in-depth understanding of adolescents and their direct experiences in relation to sexual education. It also sought to expand upon adolescents’ views on how they receive and access sexual health information.

An up to date understanding of how adolescents view, interpret and engage with sexual education is essential in developing more effective sexual education. This could lead to the development of improved prevention and intervention programs and positive outcomes for the sexual health and overall wellbeing of Australian adolescents. Therefore, the overarching aim of this study was to identify specific aspects of sexual education that adolescents consider important in relation to things like: barriers to sexual health information, effective methods of sexual education, access to sexual health information and who should best provide sexual education.

6.2 Method

6.2.1 Design

The study utilised an online questionnaire, using open-ended questions to collect qualitative data.

6.2.2 Participants

Australian adolescents between 16 and 19 years of age were invited to participate. Fifty-Five Australian adolescents (10 males and 45 females) ranging from 16-19 years of age \( (M = 18.4 \text{ years}) \) voluntarily participated in the study and were recruited via online methods. The majority of the sample reported currently attending university (83.6%), and identified their ethnic background as Anglo-Australian (64.8%), of Asian descent (14.4%), or European (10.8%). More than half of the sample reported having no religious background (58.2%), followed by one third identifying as catholic (29.1%).
6.2.3 Materials

The study used an online questionnaire and asked questions relating to demographic information (i.e. age, gender, current level of schooling), followed by nine open-ended questions relating to access and use of sexual education (See Appendix H).

6.2.4 Procedure

Approval was sought and gained through the Deakin University Human Research Ethics Committee prior to the commencement of the study. Participants were recruited via online methods, including social media, online posts within a large Australian University and group emails to facilitate “snowballing” of the study (using blind copy functions). Interested individuals were provided with the Plain Language Statement online, outlining the nature of the study. Due to the nature of the ethical approval received, adolescents less than 16 years of age were excluded from participating in the study. Participants who were not yet 18 years were asked to seek parental consent prior to completing the questionnaire. This involved ticking a checkbox in response to a statement of acknowledgement that if the adolescent was less than 18 years of age, they had sought consent from their parent/guardian to participate in the study.

6.2.5 Data coding and analysis

Descriptive data analysis was conducted using SPSS v.24 (IBM, 2016). There were no missing data.

Coding and analysing the data followed the step by step process developed by Braun and Clarke (2006). This involves five phases of thematic analysis to ensure rigour and reliability throughout the entire process, from familiarisation with the data (Phase one), to producing results (Phase five) (Braun & Clarke, 2006). Based on this process, to gain a preliminary understanding of the data set, the first author read each set of participant responses in full. All 55 participants provided responses to each of the nine questions.

Inter-rater reliability was then established using a second researcher to determine any differences in the interpretation of possible themes. Working separately, both researchers read, coded and determined themes for the data. Once this was completed, the researchers came together to discuss their findings and the results of this discussion are detailed in Table 6.1. Any differences in coding between the two researchers was
explained during the discussion of findings and reconciled through re-examination of the data to ensure findings were unanimous.

Table 6.1
*Inter-rater reliability process*

<table>
<thead>
<tr>
<th>Q</th>
<th>Researcher A</th>
<th>Researcher B</th>
<th>Final Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Two categories</td>
<td>Two categories</td>
<td>Categorical responses required, rather than themes, but unanimous agreement on the two chosen.</td>
</tr>
<tr>
<td>2</td>
<td>Three themes</td>
<td>Three themes</td>
<td>Discussion regarding how to label themes in a logical way.</td>
</tr>
<tr>
<td>3</td>
<td>Three themes</td>
<td>Three themes</td>
<td>The three themes selected were the same and thus agreement was unanimous.</td>
</tr>
<tr>
<td>4</td>
<td>Four themes</td>
<td>Three themes</td>
<td>Both researchers determined similar themes, however discussion required as to how to group these. Three main themes established, as well as a subtheme.</td>
</tr>
<tr>
<td>5</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>This was a yes/no question, thus no query as to grouping themes.</td>
</tr>
<tr>
<td>6</td>
<td>Categories</td>
<td>Categories</td>
<td>Categorical responses required, rather than themes; some discussion required to reach consensus.</td>
</tr>
<tr>
<td>7</td>
<td>Categories</td>
<td>Categories</td>
<td>Categorical responses required, rather than themes; some discussion required to reach consensus.</td>
</tr>
<tr>
<td>8</td>
<td>Categories</td>
<td>Categories</td>
<td>Categorical responses required, rather than themes; some discussion required to reach consensus.</td>
</tr>
<tr>
<td>9</td>
<td>Five themes</td>
<td>Three</td>
<td>Overall, similar themes established, but decided it was appropriate that some be ‘collapsed’, due to overlap, thus resulting in agreement on three themes.</td>
</tr>
</tbody>
</table>
6.3 Findings

The findings of the qualitative analysis revealed several key themes, as well as number of subthemes, across the dataset. Each key theme will be presented first, followed by any subthemes.

6.3.1 Adolescents’ desire/need for sexual education beginning at a young age

When considering what they believed would make sexual education more effective for adolescents, participants emphasised the importance of introducing sexual education from a young age. For example:

“I believe that sexual education should begin earlier in Primary/secondary School. I believe the younger that sexual health is learnt, the greater the chance of understanding.” (female, aged 19)

“I believe specialised, compulsory classes during high school would be effective…Classes in late primary school probably wouldn’t be a bad idea either, considering that children tend to grow up and mature faster now.” (female, aged 18)

In addition to the importance of the introduction of sexual education at a younger age, respondents also indicated that ongoing programs were necessary for adolescents to learn effectively about sexual health. For example:

“Through high schools, in programs that are implemented from year 7 through till year 12.” (female, aged 19)

“Through sexual education classes in school, but it would be most effective to continue the classes throughout high school as I only ever remember having one class in year 9 that focused on sexual education.” (female, aged 19)

“I think that schools should really implement more sexual health programs aimed at students in year 9, 10, 11 and 12. We always got the usual sex ed. classes in year 7 but I think the older we get in high school, the more desperate we are to receive more information about that kind of stuff.” (female, aged 19)
6.3.2 Trustworthiness of the source of information

Trustworthiness of the source of sexual health information was another theme that emerged for participants, both as a barrier to receiving accurate information and as an effective way for adolescents to learn about sexual health.

When asked what adolescents believed to be barriers to receiving accurate sexual health information, almost half of the sample (23/55) highlighted that while there was a lot of information available, the difficulty was that not all of it was necessarily accurate. Gaining access to accurate information, when there is such a wealth of information readily available, was highlighted as an issue with both formal (i.e. GPs and sexual health educators) and informal sources (i.e. internet/social media or family and friends).

In response to what they considered to be barriers to accessing accurate sexual health information, participants were particularly concerned about the quality of the information that is available online and the potential to be misinformed, noting that:

“When accessing information from the Internet, it may not be certified and therefore could be providing false data.” (female, aged 19)

“The internet. Adolescents are glued to their laptops and phones and can easily access the Internet and therefore get inaccurate information about different STI’s, symptoms for pregnancy, chances of getting pregnant etc.” (female, aged 18)

Participants also expressed concern that the individual values and beliefs of those providing information could affect the accuracy of information they receive, thus compromising the trustworthiness of the sources and making adolescents less likely to believe them. These sources include family, friends and even teachers:

“…informal sources of information such as from mothers, sisters and friends may not be 100% accurate…” (female, aged 19)

“Certain beliefs people have because their friends or parents have told them so they believe it is true even if it may not be.” (female, aged 19)

“…Classes at school could also be influenced by any misinformed opinions/beliefs that a teacher may have and believes to be correct.” (female, aged 18)
So far, we have identified trustworthiness as a barrier to adolescents accessing sexual health information. Further investigation, however, also found that the relationship between the source of information – i.e. parents or educators – and the adolescent can also enhance the way adolescents receive sexual health information. Specifically, respondents highlighted the importance of key characteristics of the source of the information, particularly trust and closely linked ideals such as honesty, reliability and the ability to relate to the person. For example:

“…open/honest conversations. Perhaps organised group discussions with trusted friends/adults would be a good way for young people to learn.” (male, aged 19)

“Through high school…Taught by someone who is relatable and can connect with young people.” (female, aged 19)

“Through adults they trust and trust the opinions of, in an open environment.” (female, aged 18)

6.3.3 Adolescents’ perceptions of fear as a barrier

An important theme that was evident across the dataset centred on fear as a barrier both to obtaining accurate sexual health information and to seeking professional help related to sexual health. When asked about barriers to seeking help related to sexual health from a health professional (e.g. a GP or sexual health clinic), 23 out of 55 participants made some reference relating to fear or being scared.

Adolescents reported being fearful of several specific outcomes: potential negative physical outcome of symptoms and testing; having a parent or someone they know finding out about why they’re attending a clinic/GP; and being misinformed because of the conservative beliefs of adults – that is, fear on behalf of adults. Therefore, the overall theme of fear has been divided into two parts: firstly, adolescents’ fear of the potential outcome of seeking professional help; secondly, adolescents’ perceptions of the fear of educators/adults acting as a barrier to accessing sexual health information.

6.3.3.1 Fear of outcome

When considering what prevented adolescents from seeking help from a professional when it came to their sexual health, respondents highlighted fear of the possible
outcomes regarding potential risk due to symptoms, testing and results as significant factors. For example:

“…anxiety of thinking that something might be wrong with you if you are at risk etc.” (female, aged 19)

“Being afraid of what they/you might be told.” (female, aged 19)

“…fearing the outcome and how people may react if they found out.” (female, aged 19)

6.3.3.2 Fear and conservatism of parents and educators

As mentioned previously, when considering what stood in the way of adolescents accessing accurate sexual health information, respondents highlighted several common factors relating to fear on behalf of those providing information. Specifically, participants focused on the conservative beliefs of adults and educators as impeding access to accurate information:

“Parents and adults being fearful that the information will encourage young people to engage in the sexual activity.” (female, aged 19)

“Schools fear [that] discussing sexual matters may lead to students having sex sooner than if it isn’t spoken about.” (female, aged 19)

“People not wanting others to know everything (teachers/parents/family members). The more you know, the safer it will be.” (female, aged 19)

Furthermore, respondents identified that the religious beliefs of schools, as well as those of individuals, affected the accuracy of sexual health information they received:

“Religious views and teachers not wanting to teach it/teaching it incorrectly.” (male, aged 19)

“Religion. I went to a Catholic school and they didn’t approach sexual education well and I was forced to turn to other places to get information.” (female, aged 18)

6.3.4 Adolescents’ perceptions of embarrassment as a potential barrier

Embarrassment was identified as an obstacle to accessing sexual health information. When asked about barriers to accessing accurate sexual health information and contraceptives, respondents focused on feelings associated with embarrassment, including anxiety, shame, stigma and feeling judged.
As respondents explained:

“The belief that their parents might somehow find out about the visit and its purpose and being embarrassed and may feel judged (although they might not necessarily be) about the reason for being there.” (female, aged 18)

“Being embarrassed to ask older people, the feeling that they should already know about it, or be engaged in sexual activity [already]…” (female, aged 19)

“The stigma associated with being sexually active at a certain age. I believe young people avoid understanding sexual health to reduce embarrassment. I remember being young and embarrassed when discussing sex.” (female, aged 18).

6.3.5 Accessing resources

In response to questions regarding adolescents’ views on access to resources (e.g. contraception, STI testing), the majority of respondents reported similar experiences and/or beliefs.

Respondents were reportedly aware of where to buy contraceptives, such as condoms – mainly supermarkets – as well as how and where to obtain access to birth control methods, such as the contraceptive pill – GP and pharmacy. There was also a consensus on knowing where to seek help relating to STI testing, assistance with pregnancy and general sexual health information, with most respondents citing GPs or sexual health clinics.

6.3.6 Information that adolescents require

In response to what types of sexual health information adolescents believed they needed right now, respondents listed all of the topics typically required to be covered in compulsory school-based sexual education.

More than half of the sample (32/55) made reference to requiring information relating to STIs – what the symptoms are, where to get checked, how to avoid contracting an STI, what the consequences/risks are of STIs. As one participant explained:

“…more information on STIs. In high school we seemed to learn a fair bit about pregnancy and contraception, but not a lot about STIs.” (female, aged 17).

In addition, almost the same number of participants reported needing more information relating to contraception (i.e. the benefits/disadvantages, the different options for both...
genders), pregnancy (i.e. prevention, ovulation and female cycles) and issues surrounding safe sex and relationships (i.e. consent). One participant summarises this need for ongoing sexual health information, even after high school:

“I just think we need to keep being reminded of the information, because at my school we stopped learning sex ed. in year 9 or 10 and some people maybe didn’t take in all the information then because they felt it wasn’t relevant to them.” (female, aged 17).

6.4 Discussion

The overarching aim of this study was to complement and enhance the quantitative findings obtained in Study one by drawing on the narrative responses of adolescents regarding their views and experiences of sexual health information and sexual education. Specifically, the study sought to explore factors considered important by adolescents regarding: barriers to, and the accessibility of, sexual health information, sources of sexual education, and effective methods of sexual education. Accordingly, this discussion will be broken into three key areas of sexual education: 1) what education is provided, 2) when the education is provided, and 3) how the education is provided.

6.4.1 What education is provided?

The question of what sexual education is provided is closely linked to the theme of what information adolescents feel they need from sexual education. Results of this study highlight that adolescents have demonstrated a clear consensus on where to obtain resources concerning their sexual health. Knowing where and how to access condoms and other forms of contraceptives, such as the pill, and where to seek sexual health assistance, such as for STI testing, were well documented for the respondents in this study. Despite this, the same respondents highlighted very clearly that the information they needed clarity on, or more of, pertained to these aforementioned topics. Specifically: the benefits/disadvantages of contraception and the different options for both genders; prevention of pregnancy and understanding ovulation and female cycles; and issues surrounding safe sex and relationships and the concept of consent. This suggests that the needs of adolescents are not being met through the current sexual education curriculum, indicating that what is provided is insufficient. It is concerning that the comprehensive sexual health curriculum does not appear to address the sexual
health information needs of adolescents, as it may leave adolescents open to or feeling they have no choice but to seek information from less reliable sources.

In considering formal, school-based sexual education, according to the Australian Curriculum, Assessment and Reporting Authority (ACARA) website, as of the beginning of 2017, there are two versions of the national curriculum for Australian schools, original and revised. The revised curriculum was developed in response to a review (conducted in 2013), of the Australian Curriculum, including the Health and Physical Education (HPE) curriculum, which encompasses relationships and sexuality. This 2013 review sought the input of key clinical stakeholders in providing feedback on the curriculum at the time, for example, Family Planning Victoria (FPV) provided a report to ACARA in 2014. The FPV report highlighted a number of issues regarding references to sexuality and sexual and reproductive health and wellbeing, such as topics: not being clearly defined, leading to risk of important aspects not being covered by teachers; being introduced too late into the curriculum; and, not reflecting the needs/wants of children. It also found that a considerable number of topics required further coverage. These included - sexual diversity, gender/power concerns, contraception and STIs, additional references for respectful relationships, positive sexuality, intimacy/disclosure of pleasure, reproductive health and the impact of pornography, sexting and technology on sexual health. These findings reflect the views of the adolescent respondents of the present study.

Implementing the outcomes of the review of the curriculum involves a period of transition, to allow schools time to shift to the most recent version. Given the autonomy of individual states in deciding when to make these changes, there is a potential gap in the education being received by adolescents in certain schools. This leads to inconsistencies in the application of the national curriculum. Moreover, according to the national curriculum, topics relating to sexual health and relationships are covered within the health and physical education curriculum. Each state, however, has its own curriculum policy in these areas. For example, section 3.17.2 of the Victorian Government Schools Reference Guide (Department of Education and Early Childhood Development, 2011) provides the overarching policy advice for all Victorian government schools that is not necessarily consistent with the national HPE curriculum. Moreover, not only are there potential discrepancies between the different states and
territories, but also within states due to the potential differences in the way the sexual health curriculum may be taught within schools that are not part of the government sector (i.e. independent and catholic schools). Thus, despite the implementation of a national curriculum, there are still likely to be differences between and across individual states and territories. This potential discrepancy is concerning as it highlights that adolescents may possibly be disadvantaged by the inconsistency of sexual education that they receive, based on where they go to school.

These findings clearly demonstrate that what information is provided via sexual education requires clearer definition and specification. Adolescents have identified the same topics as those of key clinical and healthcare providers, as requiring greater coverage in order to meet their needs. Inconsistent policies and content between and within states argue for the need to consider greater standardisation of content, particularly in line with the responses highlighted by this study. Although the introduction of the national curriculum is a step towards addressing this issue, the timing for this change and variable implementation across states and territories means that adolescents may continue to miss out on important information. Thus, future research is warranted in investigating the efficacy of these changes on adolescents’ sexual knowledge and behaviour.

6.4.2 When is the education provided?

The issue of when sexual education should be provided was another key theme highlighted by adolescents in this study. Specifically, respondents suggested that school based sexual education should begin during primary school. This was because they felt that, as children are maturing more quickly, the earlier they begin learning, the better understanding they will have. The importance of beginning sexual education from early on (i.e. Prep), is consistent with research which demonstrates that sexual development for children begins from birth (Walsh, 2008). The guide “Talk Soon. Talk Often” by Walsh, was developed to assist parents with talking to their children about sex and includes general milestones relating to sexual development. The guide notes that, by the time most children reach primary school age (5-6), they will show an interest in how babies are made, will likely hear about sex in the playground from peers, as well as picking up that sex is a ‘rude’ or ‘naughty’ topic (Walsh, 2008).
Generally speaking, however, there appears to be a lack of clarity and consistency about the detail of the information that is covered in relation to the topic of sexuality across school years in Australia. In Victoria, for example, sexual education is compulsory from when children commence school (Prep), until year 10, which is two years prior to the end of a complete secondary school education. By contrast, the relationship and sexual education program described in Australia’s national curriculum website provides for only the topic of relationships to be taught from Prep to Year 2, while information relating to sexuality topics is reportedly introduced from Year 3 onwards (ACARA, n.d). This is problematic in light of the finding of the present study, regarding the age at which sexual education is received. The study indicates that adolescents consider it important to begin learning about sexual health and education at a younger age. Under current polices, however, what is provided and when is determined via seemingly different school curricula and policies. As such, the practical delivery of sexual education is still likely to remain inconsistent and largely dependent upon factors that do not reflect adolescents’ expressed needs or experiences.

In considering when sexual education is provided, determining the timing (and content) of sexual education according to year level is problematic because of the saliency effect. In this context, as discussed in Chapter Four the saliency theory suggests that sexual health information may not necessarily be relevant for adolescents at the time that it is received (Montaño & Kaspzyk, 2015). As already noted, timing, i.e. the age at which sexual education or sexual health information is received, was raised by the respondents in this study. They noted several factors relating to the importance of when adolescents receive sexual health information. Specifically, they highlighted that adolescents today are in general: likely to mature more quickly, be exposed to sexual information of a variety of forms earlier than previous generations and are likely to be sexually interested and/or active at differing ages. Again, this highlights the issue of determining when to provide sexual education, as children in the same year level may not be emotionally or physically ready for particular information at the same time. Accordingly, if sexual education is to be effective it needs to occur at different ages, when the information is salient and likely to be relevant to the individual and his or her development. Thus, an inherent challenge in providing sexual education for young people is ensuring that there is a balance between delivering information when it is salient to them, and avoiding doing so before they are emotionally and physically ready to receive it.
It should be noted that the findings of the present study in this regard are consistent with those of a recent study by Byers, Sears, and Foster (2013). This study examined perceptions of adolescents in grades 6-8 and found that their opinions of the quality of school-based sexual education were positively correlated with the sexual health topics that matched the students’ interests. The potential importance of salience of information also ties in with previous research suggesting that relevant sexual education is often received after the initiation of sexual behaviours. Thus, the likelihood of risky sexual practices, such as not using protection, may be increased, leading to a higher risk of negative outcomes, such as contracting STIs (Somers & Surmann, 2005). These findings reiterate the importance of factoring in the individual needs of adolescents in determining when to provide specific topics of sexual education.

In summary, the present study highlights that the timing of sexual education is an important factor that requires further exploration in this field. Future studies may benefit from examining the salience of the sexual health information provided to adolescents, for each sexual education module. This would help researchers to understand whether the information being delivered is of importance to the adolescents at the time they are receiving it, potentially providing a basis for more tailored delivery to different groups, at least within year levels.

6.4.3 How is the education delivered?

The findings from this study highlight that for adolescents the way that education is delivered is also an important aspect of effective sexual education. Frequently, the focus in providing sexual education, is on the mode of delivery, such as whether education is provided face-to-face or online but the study indicated that the source of the education is also critical. The importance both these factors play in influencing the effectiveness of sexual education was, therefore, another important finding within this study. Respondents highlighted that, as well as the information being age appropriate and relevant, how it was delivered and who presented it were equally crucial. The first point goes to issues of the most appropriate and accessible mode of delivery (the focus of much discussion of sexual education effectiveness); the second to the need for information to be delivered by someone who the adolescents consider to be a trustworthy source. Adolescents’ views regarding the importance of the trustworthiness of the source of the sexual health information raises important design challenges. This is
because, though an adolescent may have a generally close and trusting relationship with a potential source of information (such as a parent or friend), this does not mean automatically that he/she trusts them to provide accurate information regarding sexual health. The seeming need is to find an effective balance between a trusted source, yet has the accurate knowledge/information needed by the adolescent seeking guidance. Collectively, these results suggest that, in evaluating the effectiveness of how sexual education is delivered, we need to consider the two dimensions together. These are: how sexual education is delivered, (whether formally or informally); and, the source of information and advice must be one that the adolescent deems trustworthy and credible.

6.4.4 Fear and embarrassment as barriers to accessing sexual education

The significance of fear for adolescents, in relation to seeking help for sexual health matters, is a serious concern and was another key finding of this study. The adolescent sample expressed two different notions of fear, both as barriers to seeking out and accessing sexual health information. Firstly, adolescents highlighted fear of the potential outcome to seeking help relating to their sexual health. This indicates that adolescents might avoid potentially protective behaviours (such as getting tested for sexually transmitted infections), or seeking assistance with contraceptives (such as “the pill”) out of fear of the consequences. Avoidance of these potentially protective actions appeared to be motivated by several key concerns for adolescents. Specifically, they feared the negative outcome (“bad news”) relating to the information they might receive, for example, being told they have an STI, thus confirming their worst fear. In addition, adolescents feared the possible resulting judgement by others, particularly their parents. In their responses, they made reference to fearing that their parents will find out why they’ve been to see someone (e.g. a GP) and how their parents would react to this i.e. adolescents fear the possibility of “getting into trouble”. The implication of this finding is concerning, as it represents an internal fear for adolescents, one that will likely prevent help-seeking behaviour in order to avoid these potential outcomes. By not seeking advice there may be an increase in the potential for high risk behaviour, as well as negative outcomes such as increased rates of STIs and unplanned pregnancies.

The second part of this finding is related to fear of educators/adults acting as a barrier to adolescents accessing sexual health information because of the formers’ own religious beliefs or social attitudes. The perceived or real negative judgmental attitudes of parents
or educators delivering sexual education is an external constraint, largely outside adolescents control. This has the potential to deter adolescents from seeking advice from parents, educators and, potentially, even health professionals. This theme also links back to the issue of trustworthiness and credibility of sources of information, and may point to the need for further study about the attitudes and beliefs of educators and health professionals.

Adolescents also raised the feeling of embarrassment in response to the majority of the nine open-ended questions used in the current study. They highlighted embarrassment as being particularly relevant to accessing and/or receiving sexual health information, as well as how they felt about purchasing contraceptives (such as condoms). The finding of embarrassment as a barrier to accessing sexual health information was as strongly highlighted by adolescents as that of fear. However, the key difference between these two findings is the potential impact on behaviour. Fear as both an internal and external factor, has been highlighted by the present study as a barrier that will actively prevent adolescents from seeking help, potentially compromising their sexual health and wellbeing. In contrast, the feeling of embarrassment for adolescents is one that is commonly experienced but one that is amenable to corrective action by young people. Thus, the findings of our study suggest that, even if adolescents are embarrassed, (for example, in buying condoms), they are able to overcome this through practical methods, such as asking a sibling or friend, or using self-serve checkouts to obtain what they need. In summary, compared to embarrassment, fear as a barrier is highlighted as a greater concern in terms of actually preventing adolescents from seeking help, asking questions, or taking action.

6.5 Limitations

There are several limitations that are noted for this study. Firstly, because the data were collected online, this meant there was no opportunity to probe, prompt or clarify information provided by participants. Secondly, the age of participants was limited to older young people, thus limiting the ability to generalise to younger adolescents. Finally, the sample consists of a small number of male respondents, relative to females.
6.6 Conclusions and Implications

According to the ACARA website (n.d), the health and physical education curriculum’s objectives are to cultivate skills, knowledge and understanding to facilitate students’ ability to:

“access, evaluate and synthesise information to take positive action to protect, enhance and advocate for their own and others’ health, wellbeing, safety and physical activity participation across their lifespan” (para.1).

This is the first aim listed in the health and physical education curriculum objectives. It highlights the key skills and requirements necessary for adolescents to protect and enhance their health and wellbeing. Yet, the findings of this present study suggest that adolescents do not feel equipped with the necessary skills or knowledge to fulfil the above objective, particularly as it pertains to their sexual health. On the contrary, the findings suggest that identifying trustworthy and credible sources of sexual health information is a significant concern for adolescents and a significant barrier to effective action.

Overall, the findings of this study strongly suggest that adolescents are not receiving the sexual education that they want, when they want it, indicating a feeling of dissatisfaction with current sexual education for adolescents within Australia. This finding ties in with those of a survey undertaken in 2012 by YEAH & AIC (Giordano & Ross, 2012), which examined young people’s views on sex and sexual health information in Australia. Young people reported a desire for comprehensive sexual education, encompassing a wide range of topics, and beginning at an early age and continuing throughout schooling (Giordano & Ross). It is important to note a key distinction between this and the current study relating to the difference in age of participants. In the former, the majority of the sample fall between 19-29 years of age (hence the responses are generally retrospective), while current study participants are 16-19 year olds. Despite these differences, however, the similar findings of the two studies highlight a significant lack of improvement in school based sexual education meeting the needs and wants of adolescents.
CHAPTER SEVEN: CONCLUSIONS, IMPLICATIONS & RECOMMENDATIONS

7.1 Preface

The UNESCO’s review of comprehensive sexual education (2015), in line with the Universal Declaration of Human Rights, highlighted that comprehensive sexual education is grounded in human rights, specifically requiring governments to provide sexual education that is unbiased and scientifically accurate. Furthermore, this education should be helping young people to gain the skills and knowledge that serve to aid informed and healthy choices about both relationships and sexuality. So, comprehensive sexual education has been identified as both a necessity and a right for adolescents, in terms of improving their sexual knowledge and helping to prevent the potential negative outcomes of risky sexual behaviour. Despite this, compared to adults, Australian adolescents continue: to be at a greater risk of contracting STIs; to have a lower level of sexual health literacy; and, to face more barriers to accessing appropriate sexual health resources. In addition, the Australian government considers adolescents in general to be a vulnerable population, particularly in relation to their physical and mental health, both of which have been identified as being negatively impacted by the outcomes of risky sexual behaviour. Against this background, the purpose of this thesis was to determine the impact of sexual education on the sexual knowledge, behaviour and sexual health of adolescents. Specifically, this thesis sought to examine the relationships between the sexual knowledge of adolescents, the sexual education they receive and/or have access to and any risky sexual behaviour. It was hoped that, by better understanding Australian adolescents’ experiences of sexual education, we could determine and potentially address the gap between what is currently being delivered and used and what are the most effective ways of meeting the physical and emotional needs of Australia’s adolescents.

In order to achieve the aims of the thesis, a mixed methods approach was undertaken using an explanatory sequential design. Study One was a quantitative study that investigated the relationships between specific variables relating to sexual education and adolescents’ sexual knowledge and behaviour. These variables included: the number of hours of sexual education received by adolescents; the type of sexual education (i.e. formal vs. informal); the specific sources they accessed; their level of knowledge; and their level of riskier sexual behaviour. Study Two utilised a qualitative approach,
elaborating on the findings of Study One, to examine the experiences of adolescents in relation to sexual education, such as what services they accessed, what barriers existed in accessing sexual education and what information they were missing.

This final chapter discusses the key themes emerging from the data presented in this thesis and the implications of these findings for adolescent health promotion and protection. This chapter also discusses any identified alignment between the study findings and key models of health behaviour that have been applied to sexual health research. Finally, this chapter identifies common limitations across the two studies and makes recommendations for future sexual education research and approaches with Australian adolescent cohorts.

7.2 Major Conclusions

7.2.1 Study One

There is a wealth of research about adolescent sexual health and sexual education systems, however, the majority comes from either the US or the UK. Despite Australia being comparable to both countries in a number of ways, there are key differences in their approaches to sexual education, such as a US focus on abstinence. Thus, one of the main purposes of this thesis was, not only to expand the field of research into adolescent sexual health and sexual education overall, but to also deliver a much-needed update of the current situation for Australian adolescents. Therefore, this study provided a current snapshot of a sample of adolescents who had attended a sexual health/family planning clinic in Victoria, (and to a much smaller extent, in the Northern Territory).

In addressing the overarching aims, this study sought to answer three key questions: 1) What are the contributing factors to age of first sexual intercourse? 2) Does the number of completed hours or type of sexual education received, have a significant impact on sexual knowledge? 3) Is there a relationship between level of sexual knowledge and sexual behaviour?

Given the findings of previous research, it was hypothesised that: 1) The level of sexual knowledge, having previously attended a sexual health clinic and age of first oral sex will contribute to age of first sexual intercourse; 2) A greater number of hours of sexual education received will be positively associated with sexual knowledge; 3) Formal sexual education will be positively associated with sexual knowledge and informal
sexual education will be negatively associated with sexual knowledge; and 4) Higher scores on the sexual knowledge scale will be positively correlated with fewer sexual risk behaviours.

The results of the study show that two out of the four hypotheses were partially met. The data suggested that a younger age of initiating oral sex is predicative of a younger age of first sexual intercourse. No association was found between the number of hours of sexual education and the extent of sexual knowledge, noting, however, the limitations of the study precluded testing for evidence of causation or bias in responses. The study also found no association between the level of sexual knowledge from the type of sexual education provided (i.e. formal vs informal). A small but statistically significant result showed that level of sexual knowledge contributed to more proactive sexual behaviours. The data also indicate that adolescents are more likely to utilise informal sources of sexual education, particularly their friends and the internet, which is in line with early trends identified in previous research.

7.2.2 Study Two

Study two of this thesis was designed to expand upon previous research in the field of sexual health education and research generally, and more specifically, to expand upon, and add depth to, the quantitative findings of study one. This study utilised an online questionnaire, with a series of open-ended questions to determine adolescents’ experiences in relation to accessing sexual education (whether through schooling, a GP/sexual health clinic, parents or online), what barriers they perceived in terms of accessing sexual health information or contraception, and what they perceived to be missing from sexual education for adolescents. The study used a thematic analysis approach to analyse the data, by drawing out common themes across the data set.

There were several important findings from the overall narrative of this study. The responses from the adolescent participants highlight a number of key themes in relation to how they feel about their ability to access sexual health information, contraception and sexual education generally. Specifically, their responses emphasise the importance of the accuracy and relevance of sexual health information and education they receive and/or have access to, and that this is influenced by their perceptions of trustworthiness and credibility of the source of information. Furthermore, adolescents who participated in this study demonstrated consistent opinions regarding the barriers to accessing sexual
education, sexual health information and contraception. Participants referenced factors relating to fear of judgment and stigma, as well as avoidance of negative outcomes, such as getting an STI test and receiving a confirmation that they have an STI.

The findings of this study also highlight that adolescents feel that information is missing in their experiences of sexual education, particularly in the school setting. They feel that certain topics are not examined in an appropriate amount of depth, or not at all, and that sexual education doesn’t begin soon enough, or continue all the way through schooling. This finding of dissatisfaction with the current level of sexual education that adolescents have, and continue to receive, aligns with past research here in Australia and overseas.

7.3 Suppositions and Implications of Key Findings
In light of the aims of this thesis, the combined study findings highlight two key points for discussion. The first relates to the impact that the quantity of sexual education (as measured in hours) has on sexual knowledge among adolescents. The second relates to the importance of source variables in predicting the impact of sexual education.

With regard to the impact of quantity of sexual education (measured in hours) on adolescent sexual knowledge, the results suggest that the number of hours of sexual education received has no statistically significant, positive impact on adolescent sexual knowledge. Results showed no difference in knowledge scores between those who received more than 15 hours, compared to those with less than 5 hours of sexual education. Similarly, the type of sexual education delivered (i.e. formal vs informal) had no measurable impact on knowledge. Whilst this finding is not indicative of causality, adolescents are reporting having received or accessed sexual education in the past 12 months without any association with higher levels of knowledge. Thus, further investigation is warranted in order to determine whether increased hours of sexual education is translated into an improvement in sexual knowledge. Adolescents also highlighted the importance of receiving the sexual health information they need, when they need it. Thus, this thesis posits that when adolescents receive sexual education may also be an important consideration. As discussed in Chapters Five and Six, the importance of timing is broadly in line with the theory of saliency. When considered within this context, it suggests that, for adolescents to pay attention to absorb and ultimately recall sexual health information in the future, it must be presented at a time and manner that is relevant to them in terms of their physical and social development.
Addressing the issue of timing in regard to the provision of sexual education to adolescents is challenging. Adolescents may differ considerably with regard to when they mature, both physically and emotionally, and there will also be considerable variation in the sexual behaviour of adolescents. Identifying the appropriate timing of providing sexual education can therefore be difficult. For example, if we were to consider a group of university students, the majority would already be sexually active. In the case of adolescents, however, the focus is on providing sexual education that is designed to support them before they engage in risky sexual behaviour. Therefore, predicting the appropriate timing for this kind of education is far from straightforward.

A key implication for the related issues of timing and saliency is how to adapt and tailor the current approach to providing sexual education, which currently targets the whole year level. This has greater ramifications for adolescents as they progress through school, as different information is presented in each year level. In order to achieve salience for adolescents, information may need to be revisited more than once during the year, and a process of recapping the information presented in the previous year, prior to presenting new information in the following year.

The second key finding highlights the importance of the trustworthiness of the source of sexual health information. This finding suggests that there is a concern among adolescents that the sexual health information that they receive or access may not be credible, or not come from a trustworthy source. This is important: from the perspective of cohorts of adolescents seeking information who now have virtually unlimited access to online sources; and for the educators, teachers, friends and family who may be providing advice or be answering questions. Who and what to trust in terms of accuracy and intent behind the transmission of sexual knowledge is a major challenge. Adolescents do not feel that they are equipped to determine whether a source of information is trustworthy and yet this attribute is highly valued by them. Adolescents may not yet have developed the critical skills to distinguish between those sources of information that are factual, accurate and trustworthy and those that are not. Moreover, this challenge is not restricted to the target group. Knowledge about the hierarchies of evidence in scientific research may not be understood, not just by adolescents, but by peers, family members and, on occasion, even educators/health professionals. Given the importance of trustworthiness for adolescents, there are important implications for the
education and healthcare domains in ensuring that adolescents are capable of accessing and applying relevant and factual sexual health information, in order to protect themselves. To achieve this, the provision of sexual health information by external and unbiased sources may be most appropriate; however, to tackle what is a broader system problem, a whole of community approach is suggested. Given that sexual health information is accessed so broadly, ensuring that adolescents can turn to sources they perceive as trustworthy is incredibly important. In order to do this, parents, teachers, and GPs in particular need to be up to date and across the relevant information so that adolescents do not feel judged or misinformed.

The challenges identified above in delivering adolescent sexual education that supports the avoidance of risky sexual behaviours and promotes health and well-being may also provide opportunities to design frameworks that encourage inquiry, learning and co-creation of outcomes. For example, in approaching a particular topic/issue of sexual health, teachers and students could work together to develop a systematic method of accessing and evaluating online sources, both to identify potentially misleading and harmful advice (perhaps even raising markers/warnings to other potential users) and to establish a better shared understanding of the broader context in which the learning is taking place. Experience and results/outcomes could then be fed back into broader curriculum design and policies. A similar approach might be adopted with adolescent interaction with health professionals, supporting the foundation of evidence for clinical practice guidelines for practitioners. In both cases, the collection of data should be built into the approach to promote the expansion and deepening of mixed methods evaluations that is supported by the findings of the current studies.

7.4 Theoretical Findings
In the context of this thesis, our aim was to determine whether or not our findings align with a specific theoretical model of behaviour change. As has been highlighted earlier in this work, there are many health behaviour models that focus on improving sexual health by targeting changes in sexual health behaviour, such as condom use and STI testing. Within this field, there are several frameworks that are used most consistently, including Social Cognitive Theory, the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour, and a more recent expansion of the latter two models in the form of the Integrated Behaviour Model. Although these are the most
commonly used frameworks used in targeting sexual behaviour change in an adolescent population, there are significant drawbacks with them. Research highlights that many associated studies do not have a theoretical basis for choosing a model/theory, or if they have, it is not discussed.

In considering the theoretical models of health behaviour change, this thesis did not set out to test the models; it sought to determine if and how our findings aligned with a specific model. We have concluded that, of the models examined, the Integrated Behaviour Model (IBM) provides the model of best fit for the overall findings from this research. Figure 7.1 presents the IBM and the data correlating to each of the relevant constructs is discussed below. Our findings generally suggest that three key constructs of the IBM align with the needs of adolescents: knowledge and skills to undertake the behaviour and salience of the behaviour. The first of these constructs is appears linked with intention to undertake a behaviour and the latter two are likely linked directly with undertaking the behaviour. Each of these constructs broadly tie in with the key findings of this thesis. Specifically, adolescents in our studies were concerned with the trustworthiness of the sources of information they accessed (noting, however, that this may not equate directly with quality/accuracy of information, an issue that requires further study). This may be inherently linked to both self-efficacy, to ask questions or seek out the information they need, and to the knowledge and skills they require to undertake the behaviour, such as being able to determine the accuracy and reliability of information, or to use a condom, or book an STI test. Salience of the behaviour may also link in with the above, meaning that the timing and relevance of the behaviour to the individual must be taken into account. Thus, even if an individual has the knowledge and skills to undertake the behaviour, such as using a condom prior to engaging in sexual intercourse, whether that behaviour is salient also plays a key role in whether or not that behaviour is carried out.

These findings highlight the potential importance of individual or tailored constructs of the IBM and how they might fit with the way we approach behaviour change for adolescents, specifically in reducing risky behaviour or promoting safer sexual behaviour. Moreover, these findings suggest the importance of integrated approaches - considering each of the constructs in conjunction with one another by improving adolescents’ self-efficacy, their knowledge and skills, and ensuring the salience of the
target behaviour likely to be most beneficial in strengthening behaviour change for adolescents.

**Figure 7.1.** Integrated Behaviour Model (Montaño & Kaspzyk, 2008, p.70)

### 7.5 Limitations and Challenges

This thesis set out to examine the experiences of sexual education on adolescents’ knowledge and behaviour. There are a number of significant limitations with the two studies reported in this thesis that argue for caution in interpreting results and making firm policy recommendations that, as suggested, point to the need for further studies in this important area. These are discussed in more detail in Chapters 5 and 6 but notable key limitations across the studies include the size of, and a limited spread of the sample populations and the gender and age bias of the targeted sample.

As highlighted in the introduction, as an age group adolescents are categorised as comprising those 10-19 years of age. A key challenge in undertaking research with this group is the accessibility and acceptability of the sample given the nature of the research. How to define the age of an adolescent in the context of sexual health research is difficult, as it brings into question whether or not it is ethical to expose adolescents to topics that they may not yet be aware of, ready for, or interested in. The age of acceptability of asking adolescents about sexual health behaviours and related topics is often 16 years of age or older. This is because, ethically, a participant should not be
exposed to risk or harm and there is a hesitancy to allow a population, already considered vulnerable, to be exposed to potential harm. Thus, access to adolescents across a range of ages, particularly under 16 years of age, is often difficult when it comes to obtaining ethical approval in this area of research. This creates a limitation in the research, as we are not able to obtain the full picture of what adolescents already know and are exposed to. While addressing this limitation in future research creates a challenge if we restrict our research in this area to retrospective samples only we necessarily constrain our understanding of all the key elements of the situation and potential solutions. For example, in Europe countries such as France and Sweden have rates of STIs and pregnancy that are much lower than Australia, suggesting an area of valuable research and learning would be to look to such countries to identify new or revised approaches that may be relevant in minimising potential harm here.

7.6 Recommendations
At the time of studies within this thesis, there was no consistent, national framework for sexual education in Australia. Thus, future research should address whether and how to update and standardise the curriculum. As part of this process, it is recommended that a longitudinal study be undertaken, to track the outcomes of the revised sexuality and relationships education components of the national curriculum. A cross-sectional study of this nature would potentially go a long way in determining the efficacy of a changed curriculum on measurable outcomes, such as risky sexual practices and knowledge, and would also be useful in addressing the on-going challenge for teachers in presenting this material. Given that past research and the findings of this thesis have consistently highlighted a disconnect for adolescents with both the material and the way it is taught, it is important to capture any potential improvement that these changes to the curriculum may provide.

Given the qualitative findings regarding the potential importance of salience of information and trustworthiness of sources, as noted in Chapter Six future research should also consider investigating these factors in depth. In order to do so, it is suggested that a study which implements a program that focuses on the collaborative task of systematically identifying and ranking the credibility and accuracy of online sources. This program would seek to develop the skills required to appraise critically the information available to adolescents, as well as providing them with a list of reliable
resources that are salient to them and accessible when required. Sexual knowledge could then be assessed, comparative to a sample who did not participate in the program, to determine whether developing and enhancing practical skills and salience, improves learning outcomes. This should then be followed up by qualitative measures, to determine the views of both adolescents and teachers, which can then be fed back in order to modify or improve the program.

7.7 Conclusion
This thesis highlights the need to closely consider how we approach sexual education in Australia. At increasingly younger ages, Australia’s adolescents are being exposed to messages about sex, sexuality, relationships, sexual health and stigma surrounding these topics. How they receive, respond to, and/or apply this information can have very strong implications for their overall physical and mental health and wellbeing. As our studies suggest, for adolescents timing is an important factor for the salience of sexual health information, as is trustworthiness of the source of the information, whether it be a teacher, friend, family member or the internet. Targeting factors relevant to the needs identified by adolescents, in conjunction with constructs associated with behaviour change may lead to more positive outcomes for adolescents. In considering the findings of this thesis, sexual education must meet the needs of the child or the adolescent. This is a considerable challenge and highlights the importance of a multidisciplinary and imaginative approach to address both when and how we deliver sexual education and sexual health information to adolescents.
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<table>
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<tr>
<th>Study</th>
<th>Sexual Education Focus</th>
<th>Variables measured</th>
<th>Methods &amp; Sample</th>
<th>Main findings</th>
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<tr>
<td>Abraham et al. (2004)</td>
<td>Cognitive impact on research-based, teacher delivered sex education program (SHARE)</td>
<td>Beliefs</td>
<td>RCT in 25 schools;</td>
<td>Higher scores than those in control group, Early reproductive sexual health associated with reduced sexual risk. Parental education associated with more sexual partners</td>
</tr>
<tr>
<td>Ancheta et al. (2005);</td>
<td>Source content and timing of reproductive health education</td>
<td>Attitudes, knowledge &amp; behaviour</td>
<td>Self-report (n=113)</td>
<td>Early reproductive sexual health associated with reduced sexual risk. Parental education associated with more sexual partners</td>
</tr>
<tr>
<td>Barker et al., (2010)</td>
<td>Evidence of impact of programs regarding sexual reproductive health of men and boys</td>
<td>Attitudes, knowledge, behaviour</td>
<td>Review of evaluation studies used with men and boys (n=58)</td>
<td>Well designed studies lead to changes in behaviour &amp; attitudes related to SRH</td>
</tr>
<tr>
<td>Barnett &amp; Hurst (2003)</td>
<td>Evaluation of school-based sexuality education program compared to abstinence only program</td>
<td>Attitudes, knowledge, behaviour</td>
<td>Schools (n=17); students (n=271) 1st evaluation; pre-test-post-test. 2nd evaluation; quasi-experimental design with treatment and comparison groups.</td>
<td>First evaluation: Increases in knowledge about sexuality and sexual behaviour. No change in attitudes. Second evaluation: Program effects only found for knowledge.</td>
</tr>
<tr>
<td>Berenson et al., (2006)</td>
<td>Relationship between source of sexual information &amp; sexual behaviour</td>
<td>Behaviour</td>
<td>Female students (n=892)</td>
<td>Exposure to information about condom use by primary sources (e.g. family &amp; friends) associated with increased likelihood of engaging in behaviour</td>
</tr>
<tr>
<td>Blake et al. (2003)</td>
<td>Relationship between sexual practices and condom availability programs combined</td>
<td>Behaviour</td>
<td>Students enrolled in high school with condom</td>
<td>In schools with condom availability adolescents less likely to report lifetime or recent</td>
</tr>
</tbody>
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### APPENDIX A: Summary table of studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Title</th>
<th>Type of Study</th>
<th>Participants</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleakley et al., (2009)</td>
<td>Relationship between sources of sexual education and beliefs</td>
<td>Beliefs</td>
<td>Survey data from quota sample of youth (n=459); Regression analyses</td>
<td>Likely to have belief to delay sex when source of information is parents, grandparents or religious leaders. Belief’s likely to increase likelihood of sex when source is friends, cousins and media.</td>
</tr>
<tr>
<td>Borawski et al. (2005)</td>
<td>Abstinence-until marriage education</td>
<td>Knowledge, beliefs &amp; behaviours</td>
<td>Non-randomised trial of middle school students (n=2069)</td>
<td>Intervention students reported increase in knowledge &amp; abstinence beliefs</td>
</tr>
<tr>
<td>Borgia et al. (2005)</td>
<td>Effectiveness of peer-led education compared to teacher-led in schools.</td>
<td>Attitudes, knowledge, behaviour</td>
<td>Randomised trial in Schools (n=18); students (n=1295). Assessed at pre &amp; post-test</td>
<td>Improvement in knowledge and attitudes for both groups. Peer-led greater improvement in knowledge of HIV.</td>
</tr>
<tr>
<td>Capuano et al. (2009)</td>
<td>Evaluation of adolescents knowledge of sexuality</td>
<td>Knowledge</td>
<td>Survey data of students (360). One school received sex education</td>
<td>Knowledge significantly improved post intervention</td>
</tr>
<tr>
<td>Coyle et al. (2004)</td>
<td>Evaluated long-term effectiveness of theoretically based curriculum: Draw the Line/Respect the Line</td>
<td>Attitudes, knowledge, behaviour</td>
<td>Randomised trial in schools (n=19); students (n=2829). Tracked for 36 months</td>
<td>Delayed sexual initiation, greater knowledge exhibited than control &amp; more positive attitudes toward not having sex – for boys, not girls.</td>
</tr>
</tbody>
</table>

Sexually active adolescents twice as likely to report use of condoms but less likely to use other methods of contraception.
<table>
<thead>
<tr>
<th>Study</th>
<th>Description</th>
<th>Behaviour</th>
<th>Study Design</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coyle et al. (2006)</td>
<td>Evaluation of theoretically based curriculum designed to reduce sexual risk behaviours associated with HIV, STDs and unintended pregnancy.</td>
<td>Reduced frequency of intercourse: without a condom; without a condom with steady partners, number of times reported intercourse &amp; increased condom use at the 6-month follow-up. Effects insignificant at 12- &amp; 18-month follow up</td>
<td>Randomised trial in community day schools (n=24); students (n=988). Self-report questionnaire. Assessed 4 times during 18-months</td>
<td>Coyle et al. (2006)</td>
</tr>
<tr>
<td>Crosby et al. (2009)</td>
<td>Comparison of sex education provided by parents or in formal settings looking at four topics: pregnancy, menstrual cycle, STDs and methods of birth control.</td>
<td>Not communicating with parents on all four topics meant adolescents were significant more likely to report multiple sex partners in last 3 months</td>
<td>Behaviour Females (n=110) 16-24 years Self-administered questionnaires</td>
<td>Crosby et al. (2009)</td>
</tr>
<tr>
<td>Dilorio et al. (2006)</td>
<td>Evaluation of mother-adolescent HIV intervention program: Keepin’ it R.E.A.L.!</td>
<td>No difference in groups for abstinence rates among adolescents. Adolescents in LSK group increased condom use rate. In SCT &amp; control groups scored higher on knowledge of HIV.</td>
<td>Behaviour Adolescents (11-14, mostly male) &amp; Mothers (n=582). Control group &amp; two treatment groups. Based on SCT and LSK. Assessment conducted at 4, 12 &amp; 24 months.</td>
<td>Dilorio et al. (2006)</td>
</tr>
<tr>
<td>Dilorio et al. (2007)</td>
<td>Intervention promoting delay in sexual intercourse among sexually active boys &amp; communication with fathers.</td>
<td>Participation by father indicated higher rates of abstinence and condom use by the boys.</td>
<td>Group randomised trial. 11-14 year old boys and their fathers (n=277)</td>
<td>Dilorio et al. (2007)</td>
</tr>
<tr>
<td>Study</td>
<td>Focus Area</td>
<td>Behaviours</td>
<td>Methodology</td>
<td>Findings/Implications</td>
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<tr>
<td>Fisher et al. (2011)</td>
<td>Evaluation of HIV/AIDS intervention for African American and Hispanic adolescents.</td>
<td>Behaviours</td>
<td>Delivered in community settings to high risk individuals (n=922)</td>
<td>Reductions in risk observed at 30 and 120 days post-intervention and were strongest for African Americans.</td>
</tr>
<tr>
<td>Fontes &amp; Roach (2007)</td>
<td>Determining predictors and confounders of unprotected sex, with sex education as a predictor.</td>
<td>Behaviours</td>
<td>Web based study (n=10,138)</td>
<td>Significant finding of sex education never received versus sex education first received under 10 years of age as a predictor of unprotected sex.</td>
</tr>
<tr>
<td>Haglund &amp; Fehring (2010)</td>
<td>Association of religiosity, sexual education and family structure within risky sexual behaviours.</td>
<td>Behaviours</td>
<td>Dataset sample (n=3,168) women and men, 15-21 years of age.</td>
<td>Participants with formal and parental sex education including abstinence were less likely to have had sex and had fewer partners.</td>
</tr>
<tr>
<td>Herrman et al. (2011)</td>
<td>Evaluation of effectiveness of infant simulator to influence perceptions of pregnancy and parenting: Baby Think it Over.</td>
<td>Perceptions</td>
<td>Pilot study: Pre-experimental, one group pre/post test. Sample from school wellness centre (n=79).</td>
<td>No significant difference found in mean pre/post-test scores.</td>
</tr>
<tr>
<td>Study</td>
<td>Intervention Focus</td>
<td>Behaviour</td>
<td>Methodology</td>
<td>Findings</td>
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</tr>
<tr>
<td>Kirby et al. (2004)</td>
<td>Measured impact of school-based HIV, STD, pregnancy-prevention intervention: Safer Choices compared to standard knowledge based programs.</td>
<td>Behaviour</td>
<td>Schools randomly assigned (n=20). Students (n=3,869) in 9th grade, tracked for 31 months.</td>
<td>Was effective on four outcomes of condom use, greater impact on males, greater effect on Hispanics in delaying sexual activity. Increased condom use in those having unprotected sex prior to intervention.</td>
</tr>
<tr>
<td>Kowal &amp; Blinn-Pike (004)</td>
<td>Examined influence of siblings on adolescents attitudes towards safe sex practices.</td>
<td>Attitudes</td>
<td>High school students approx. 17 years (n=297). Self-report questionnaires.</td>
<td>Discussion with siblings about safe sex, combined with parental discussions predicted better attitudes towards safe sex practices.</td>
</tr>
<tr>
<td>Lauszus et al. (2011)</td>
<td>Examining gender specific knowledge on sex.</td>
<td>Knowledge and behaviour</td>
<td>Cross-sectional questionnaire of students in 9th grade, 15 years of age.</td>
<td>School most important source of student without sexual debut. Those who had had sex used all other sources more than...</td>
</tr>
<tr>
<td>Study</td>
<td>Methodology</td>
<td>Knowledge/Behaviour</td>
<td>Findings</td>
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<tr>
<td>Lightfoot et al. (2007)</td>
<td>Hypothesis testing of computerised intervention being as effective as in person, small group intervention.</td>
<td>Behaviour</td>
<td>Adolescents in computerised intervention were less likely to engage in sexual activity and reported fewer partners.</td>
<td></td>
</tr>
<tr>
<td>Manlove et al. (2008)</td>
<td>Utilised behavioural model of health service to examine whether family, individual, sex education &amp; partner factors associated with measures of condom use for adolescent males.</td>
<td>Behaviour, attitudes.</td>
<td>Male, Hispanic adolescents and those who received no formal education had lower odds of condom use and/or consistency. African Americans and those with more positive attitudes about condoms had greater odds.</td>
<td></td>
</tr>
<tr>
<td>Milhausen et al. (2008)</td>
<td>Examined the frequency of sex upon completion of an</td>
<td>Behaviour</td>
<td>No significant differences in frequency of sex those who had not. Friends/peers play a big role.</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Intervention</td>
<td>Duration</td>
<td>Sample Characteristics</td>
<td>Findings</td>
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<tr>
<td>Oiringane et al. (2009)</td>
<td>Conducted a systematic review to assess the effects of primary interventions e.g. school-based, community/home-based, clinic based and faith-based, on unintended pregnancies among adolescents.</td>
<td>NA</td>
<td>Systematic Review (n=41) RCTs were evaluated.</td>
<td>Concluded that combination of educational and contraceptive methods appears to reduce unintended pregnancy. Evidence for program effects on biological measures is limited. Due to differences in comparison of different interventions is difficult.</td>
</tr>
<tr>
<td>Parkes et al. (2005)</td>
<td>Examined sexual health clinics as a source for encouraging condom use through free supply of condoms and counselling.</td>
<td>Behaviour, attitudes</td>
<td>Cross sectional multivariate model. Adolescents (n=1013), 15-16 years. Longitudinal multivariate model – measured at 13-14 and 15-16 years (n=3432).</td>
<td>Visiting free condom service associated with linked with greater condom use consistency and positive changes in attitudes towards condoms.</td>
</tr>
<tr>
<td>Paul et al. (2010)</td>
<td>Examined experience of female early school leaver’s experience of sexual activity and sexual health.</td>
<td>Knowledge, attitudes</td>
<td>Pilot study. Females (n=45), average age 17.5 years. Self-completed questionnaire &amp; focus groups to evaluate program.</td>
<td>Knowledge around sex showed some improvement following intervention, minimal changes in attitudes towards sexual behaviour.</td>
</tr>
<tr>
<td>Pedlow &amp; Carey (2004)</td>
<td>Reviewed rationale for developmentally appropriate</td>
<td>Attitudes, knowledge, behaviours</td>
<td>Review of interventions (n=24). Factors: evaluated risk reduction</td>
<td>Interventions tested in RCTs were more effective. Interventions with booster sessions</td>
</tr>
</tbody>
</table>
**APPENDIX A: Summary table of studies**

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention and Sampled Adolescents</th>
<th>Analysis</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pole &amp; Flicker (2010)</td>
<td>Document behaviour of ethno-culturally diverse sample. Assess association of experience of 11 behaviours with factors such as: age, gender, race, location of sex education.</td>
<td>Urban youth (n=1,200)</td>
<td>Indicate that multiple locations of sexual education are associated with a higher sexual behaviour category, e.g. higher rates of intercourse activity</td>
</tr>
<tr>
<td>Poobalan et al. (2009)</td>
<td>Review to identify characteristics of effective sex and relationship education interventions and programs</td>
<td>Review of reviews. Six databases searched (n=30 systematic reviews). Included participants between 10-18 years.</td>
<td>Effective: Targeting younger age group before sexually active, tailored to physical and biological development stages, theory based, abstinence programs incorporating values of relationships and provide skills training. Adequate training of personnel delivering interventions.</td>
</tr>
<tr>
<td>Study</td>
<td>Description</td>
<td>Methodology</td>
<td>Results</td>
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<tr>
<td>Puentes &amp; Wassel (2003)</td>
<td>Examined whether Peer Family Life Education Project would work as alternative to established family life education curriculum.</td>
<td>Pre and post-test design. 80-100 5th grade students. Five week program.</td>
<td>Increase between pre and post-test intervention of 25% indicating that peer-educators were effective in conveying information.</td>
</tr>
<tr>
<td>Realini et al. (2010)</td>
<td>Examined effectiveness of Big Decisions, sexuality education to promote abstinence as well as condom and contraceptive use.</td>
<td>Attitudes, behaviour</td>
<td>Pre and post test comparison indicate improvement in more scores for each item. Male participants pre-test responses indicated higher risk status than for females.</td>
</tr>
<tr>
<td>Roberto et al. (2007)</td>
<td>Assessed a computer and internet based intervention designed to influence variables related to prevention of pregnancy, STDs and HIV.</td>
<td>Attitudes, behaviour and knowledge.</td>
<td>Students in experimental school less likely to initiate sexual activity, had greater general knowledge and more positive attitudes towards waiting to have sex.</td>
</tr>
<tr>
<td>Schubotz et al. (2004)</td>
<td>Examination of sexual behaviour of young people in Northern Ireland. Asked about attitudes towards sex, experiences of sex education, knowledge of STIs etc.</td>
<td>Knowledge and behaviour.</td>
<td>Peer pressure to engage in sex was more prevalent among males than females. Young people regard their friends as most important source of sex education. School second most important source</td>
</tr>
<tr>
<td>Study</td>
<td>Intervention</td>
<td>N/A</td>
<td>Sample</td>
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<tr>
<td>Sieving et al. (2011)</td>
<td>Examines Prime Time, a youth development intervention that aims to reduce pregnancy risk among adolescent girls seeking clinic service who are at a high risk of pregnancy. Combination of case management and peer leadership programs.</td>
<td>RCT. Females (n=253), 13-17 years. Prime Time program plus usual clinic service for 18 months. Participants completed self-report surveys at baseline and 12 months after enrolment.</td>
<td>At 12 months, intervention group reported more consistent use of condoms, hormonal contraception and dual contraceptive methods with their most recent partner compared to control.</td>
</tr>
<tr>
<td>Smith et al. (2011)</td>
<td>Qualitative evaluation of experiences and perceived benefits of students participating in abstinence-plus sex education</td>
<td>N/A</td>
<td>Inner-city high school students (n=1,130) Evaluated at enrolment and follow up using thematic analysis.</td>
</tr>
<tr>
<td>Smylie et al. (2008)</td>
<td>Evaluation of effectiveness of multidimensional sex education program. Offered by representatives from community groups.</td>
<td>Knowledge, attitudes, and perceptions.</td>
<td>Male and females (n=240), grade nine students. Intervention and control groups. Completed self-administered questionnaires at baseline and a month after completion of program.</td>
</tr>
<tr>
<td>Sneed (2008)</td>
<td>Examined relationship between parent adolescent communication, topics and sexual behaviour.</td>
<td>Completed self-administered questionnaire at a community based organisation. Males and females between</td>
<td>Content of conversations was related to sexual behaviour. More adolescents told to wait to have sex until married were not sexually active</td>
</tr>
</tbody>
</table>

**APPENDIX A: Summary Table of Studies**

but wanted more sex education in school.
<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somers &amp; Surmann (2005)</td>
<td>Examined relationship between sources and timing of sexual education.</td>
<td>Attitudes and behaviour. Ethically and economically diverse male and female high school students (n=672). Regression analyses used. Earlier learning from most sources and more learning from schools about topics such as importance of birth control, generally predictive of less frequent oral sex.</td>
</tr>
<tr>
<td>Stephenson (2008)</td>
<td>Examined the long term effects of peer-led sexual education program (RIPPLE)).</td>
<td>Behaviour Cluster randomised trial; 7yr follow up. Schools (n=27). Students (n=9,000+). Peer educations, 16-17years, trained to deliver three 1-hr classroom sessions to 13 &amp; 14 year old students. No difference in abortion rates between groups. Fewer girls in the peer-led intervention self-reported pregnancy by 18 years.</td>
</tr>
<tr>
<td>Sulak et al. (2006)</td>
<td>Examined impact of sexual education program implemented in an academic medical centre.</td>
<td>Knowledge, attitudes and behaviour Pre-post-test design. Pre-survey prior to starting 2-week program (n=26,125), and post-survey the day after last Knowledge improved for all grades and a shift in attitude was made towards delaying sexual activity.</td>
</tr>
</tbody>
</table>
### APPENDIX A: Summary table of studies

<table>
<thead>
<tr>
<th>Study Authors and Year</th>
<th>Objective</th>
<th>Sample</th>
<th>Behaviour</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>Synovitz et al. (2005)</td>
<td>To assess sexual behaviours and protective sexual behaviour intentions of college students and assess for differences such as sexual education.</td>
<td>Sample (n=1,168) from across four universities.</td>
<td>Previous sexuality education was statistically significantly related to selected protective sexual behaviour intentions. More white than African American students reported engaging in sexual behaviours.</td>
<td></td>
</tr>
<tr>
<td>Trenholm et al. (2008)</td>
<td>Examines impact of four abstinence-only education programs on adolescent sexual activity and risks of pregnancy and STDs.</td>
<td>Experimental design using survey data from (n=2,000+) who were randomly assigned to either a program group or a control group.</td>
<td>Findings show no significant impact on adolescent sexual activity, nor were differences in rates of unprotected sex. Some impact on knowledge of STDs was seen.</td>
<td></td>
</tr>
<tr>
<td>Voisin et al. (2012)</td>
<td>Assessed for attendance at sex education classes in relation to STI prevention knowledge.</td>
<td>Sample of African American girls from three public health clinics.</td>
<td>Attendance at sexual education classes did not predict STI knowledge. Rather, being older, greater self-mastery and being employed were predictive of STI knowledge.</td>
<td></td>
</tr>
</tbody>
</table>