Adolescent Knowledge, Beliefs, and Attitudes towards Sex, Marijuana, and Alcohol

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A thesis submitted in partial fulfillment of the requirements for the degree of

Master of Education

in

School and Clinical Child Psychology

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Abstract

Appreciating the complex nature of adolescent high-risk behaviour can have far reaching implications for the development of effective educational programming. The purpose of this study was to examine the general knowledge, attitudes, and beliefs of adolescents between the ages of 12 and 18, from seven central Alberta junior and senior high schools, regarding high-risk behaviours of sexual activity, alcohol use, and marijuana use. Descriptive statistics were used to interpret the data. Overall, results revealed that adolescents have some inaccurate perspectives about topics related to their sexual health and substance use. Based on this study, there are some inconsistencies between adolescent perspectives and what they are expected to know according curricular objectives on sexual health and substance us. There are also some inconsistencies between senior high student and junior high student perspectives. Adolescents also provided valuable input into their perspectives on what they believe is of concern regarding their sexual health and substance use, including what they believe they need to learn more about, and whom they believe is the best suited to educate them on these matters.

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Introduction

Understanding adolescents can be complex. Not only are they going through marked physiological, neurological, and psychological changes, but they are also encountering many of life's defining rites of passage during this developmental stage. Many adolescents are acquiring and maintaining part-time jobs, falling in love for the first time, deciding on a career path, maintaining competitive grades, and likely developing meaningful life-long friendships—all of which have the potential to aid in facilitating their transition to adulthood. Notably, in the midst of these rapid changes, adolescents become more prone to potentially detrimental activities such as risk taking, sensation seeking, and reckless behaviour (Dahl, 2004). Of significant concern is that adolescent high-risk behaviours occur during "a time when trajectories are set (or altered) in ways that lead to difficulties in adulthood" (Dahl, 2004, p. 7).

Authors de Guzman and Pohlemeier (2014) summarize high-risk behaviour in adolescents as:

> those that can have adverse effects on the overall development and well-being of youth, or that might prevent them from future successes and development. This includes behaviours that cause immediate physical injury…as well as behaviours with cumulative negative effects…("What are High Risk Behaviours," para. 1).

Reyna and Farley (2006) also add that the stage of brain development adolescents are at, their degree of impulsivity, and their individual differences, can not only lead to risk-taking behaviour but can also create barriers to success in traditional interventions aimed at reducing adolescent engagement in risk-taking behaviour. Moreover, these authors highlight that the context within which there is the potential for high-risk behaviours to occur must also be considered (Reyna & Farley, 2006). They explain that:

> much depends on the particular situation in which a decision is made. In the heat of passion, in the presence of peers, on the spur of the moment, in unfamiliar situations, when trading off risks and benefits favors bad long-term outcomes, and when behavioural inhibition is required for good outcomes (p. 1).

Independent from the context, the general kinds of high-risk behaviours that adolescents may engage in can include self-injurious behaviours (such as cutting), violence (towards self or others), suicide, substance use (drugs and alcohol), risky sexual behaviours, and behaviours related to obesity and unhealthy dieting (such as bulimia or anorexia) (de Guzman & Pohlmeier, 2014).

Recognizing these risks, educators and policy makers, such as Alberta Education and Alberta Health Services, have capitalized on the school environment as one setting within which adolescents may be provided with the necessary information to help reduce these risks through approaches such as the Alberta Program of Studies Health and Life Skills Curriculum, or program initiatives such as 'teachingsexualhealth.ca'. One promising area of such focus in schools has been prevention education related to sexual behaviour, though impacts are varied. Peskin et al. (2015) found in their computer-based education program study that although there was some improvement in adolescent knowledge about sexuality, there was no significant impact on adolescent reports of reduced engagement in sexual behaviour after participating in the online program. They explained one possible reason for this lack of impact on behaviour could be that there are too few lessons on the subject matter.

In another sexual health education program study on two grade 9 programs, Markham et al. (2014) found that when compared to the control group, participants in the risk reduction program, and participants in the risk avoidance program, reported delayed engagement in anal

sex into their grade-10 school year, and reported a reduction in engagement in unprotected sex. However, there was no delayed engagement in oral or vaginal sex. These authors note that:

> Evidence-based, middle school sexual health education programs can have positive short-term effects on adolescent behaviour. Although they may be necessary to support healthy adolescent behavior, they are not sufficient over the long term to prevent many sexual risky behaviours. (Markham et al., 2014, p. 158)

Another area of focus in schools has been prevention education related drug and alcohol use. Newton, Teesson, Vogl, and Andrews (2010) found a significant reduction among grade 8 students in reported alcohol and cannabis use for up to 12 months following an in-school internet based prevention program, in comparison to a control group who received regular health education content. However, these authors noted that the participants in their study are students from private schools whom typically come from high-socioeconomic status families. As such, their findings may not be inferred to be representative of outcomes for high-risk adolescents, or adolescents that come from low socio-economic backgrounds (Newton et al. 2010). In another example, West and O'Neal (2004) conducted a meta-analysis on the effectiveness of what could be considered the most well known and most frequently used in-school substance abuse prevention program in the world (Finley, 2012) known as the Drug Abuse Resistance Education program (D.A.R.E.). West and O'Neal (2004) examined 11 peer-reviewed studies on the long-term impact of D.A.R.E. between 1991 and 2002. In their analysis they found that the program is not an effective substance abuse prevention program to the extent that "the effect size [they] obtained would have needed to be 20 times larger to be considered even small" (West & O'Neal, 2004, p. 1028; see also Finley, 2012). They added that there have been revisions to the D.A.R.E.

program that may show greater promise in successful substance use prevention, but these revisions have not yet been subject to a comprehensive review to evaluate their level of success.

The provincial directive in Alberta has teachers follow subject oriented general learning outcomes as well as specific learning objectives within each subject, which are all articulated in the Program of Studies (POS). As such, the POS provides the learning outcomes for teaching children and adolescents about sexual health and substance use. Various prevention education programs address these learning outcomes within the school context; however, the impact of these specific approaches has not been evaluated in Alberta. Thus, consideration of both the research in the field, as well as currently in practice, reveals recognition of the importance of these approaches, but a lack of certainty about approaches that may generate the most positive and lasting impacts on adolescent behavior. Additionally, Leatherdale and Burkhalter (2012) explain that, based on their research about the prevalence of high-risk behaviour of Canadian adolescents, their findings "[present] a bleak picture of the substance use profile of Canadian youth" (p. 320) and that, "current substance use prevention efforts provided to secondary school students appear to be failing" (p. 321). To this end, researchers have begun to call for examination of adolescent perspectives about these topics, suggesting that a youth perspective is a necessary component in developing promising prevention initiatives (e.g. Gowen & Winges-Yanez, 2014; MacDonald et al. 2011; Stevens et al. 2013). As such, the current study was geared towards understanding perspectives on: 1) adolescent high-risk behaviours related to substance use, specifically marijuana use, and alcohol use, and risky sexual behaviour, and 2) adolescent perspectives on these topics within the school context with a sample of junior high, and senior high students. For the purposes of this study, when the term 'perspectives' is used, it encompasses the knowledge, beliefs, and attitudes of the adolescents in this study.

Literature Review

Alcohol

Describing high-risk alcohol use. Alcohol exists in many cultures around the world. Alcoholic beverages are often available for consumption during traditions such as weddings, birthday parties, and Christmas parties, as well as major life transition celebrations. In many countries where alcohol is permitted, there are legal age limits for when individuals are permitted to purchase, posses, and consume alcohol legally. In Canada these age limits range between 18 and 19 years old, although some provinces (such as Manitoba) permit 16 year olds to consume alcohol under the supervision of an adult (Canadian Centre on Substance Abuse, 2014). In the United States the legal drinking age for alcohol is 21 years of age, however, again there are some differences in alcohol possession and consumption guideline differences by state under the supervision of an adult (Federal Trade Commission, 2013). By comparison, many European countries have the legal minimum age for drinking set at 16 years of age (International Center for Alcohol Policies, 2015). Regardless of the existing age limits, presumably the intention is to regulate safe drinking practices.

High-risk alcohol use refers to two forms of alcohol consumption: binge drinking and heavy drinking. Both of these forms of alcohol consumption are also considered alcohol abuse. Binge drinking, also referred to as heavy episodic drinking, occurs when women consume more than 4 drinks in a 2-hour time period and men drink more than 5 drinks in a 2 hour time period, and their blood alcohol concentration levels are .08 g/dl or higher (National Institute of Alcohol Abuse and Alcoholism, NIAAA, n.d.). Heavy drinking occurs when an individual consumes 5 or more alcoholic beverages on the same day for 5 out of the last 30 days (Substance Abuse and Mental Health Services Administration, SAMSHA, n.d.). Both of these forms of alcohol

consumption are also part of the diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) that fall under the diagnosis of "Alcohol Use Disorder" (American Psychiatric Association, 2013).

Primary physiological consequences that are associated with binge drinking and heavy drinking are not uncommon. In some cases consequences can manifest for an individual during their first experience of binge drinking, or heavy drinking (NIAAA, 2010). According to the NIAAA document "Beyond Hangovers: Understanding Alcohol's Impact on Your Health" immediate consequences can include changes in mood and/or behaviour, depression, agitation, memory loss, and seizures (2010, p. 5). Consequences of binge or heavy drinking can also include deficits in motor co-ordination (Houa, Tomberg, & Xavier, 2010) impairment in the body's ability to regulate temperature (Yoda et al., 2005; 2008), sleep and mood disturbances (Geoghegan, O'Donovan, & Lawlor, 2012), impaired cognitive functioning (Houston et al., 2014; Maurage et al., 2012), and impaired memory and learning (Moulton et al., 2005). Alcohol abuse can also lead to damage to the heart (Beyer, 2004), liver (Diehl, 2002), and immune system (Afshar et al., 2015), and can lead to various types of cancer (Rehm, 2011) (see also NIAAA, 2010; Foster & Marriott, 2006).

Pervasive and long-term secondary consequences can also occur as a result of high-risk alcohol use. The use of substances during high school is one of the strongest predictors of later substance abuse (Spear, 2015). Adolescents who drink alcohol are more likely to use drugs (Grunbaum et al., 2004), have academic problems (Bonnie, 2004), and engage in risky sexual activity (Tapert, Aarons, & Sedlar, 2001), and suffer from mental health issues such anxiety or depression (Bonnie, 2004). They are also at greater risk of beginning sexual activity at an earlier age, having sex with multiple partners, and engaging in unprotected sex (Agius, et al. 2013;

Fergusson & Lynskey, 1996). Moreover, this suggests that adolescents who engage in these risky sexual behaviours as a result of alcohol use may also be at greater risk of consequences related to high-risk sexual activity, such as contracting a sexually transmitted infection (STI), and causing unwanted pregnancies.

Adolescents who consume alcohol are also at risk of suffering from lasting negative neurobiological changes and functional impairments (Spear, 2002; Jacobus & Tapert, 2013). Spear (2015) notes that the type of alcohol consumption patterns adolescents engage in can be a predictor of future alcohol use and abuse patterns, and can have lasting effects on the neuropsychological development of the adolescent brain. Essentially, "young…are uniquely susceptible to alcohols effects" (Novier, Diaz-Granados, & Matthews, 2015, p. 67). Additionally, the rate of increase in alcohol consumption in individuals at the adolescent stage of development may be unusually excessive when compared to adults (Spear, 2002).

Although Spear (2015) emphasizes the limited scope of research currently available, there is some evidence to suggest that the age and developmental stage at which exposure to alcohol (or marijuana) occurs can influence the nature of the long-term consequence. She suggests that exposure during early to mid-adolescence is more likely to impact circumstances such as social behaviour, reward sensitivity, and affect, whereas exposure during late adolescence may have greater impact on cognitive task performance.

Prevalence of alcohol use. Leatherdale and Burkhalter (2012) studied 45, 425 Canadian students from grades 7 to 12 and reported that 27% of youth report currently using alcohol; from this group males were more likely than females to report alcohol use. They also found a significant increase of alcohol use by grade; 3.4% of grade 7 students reported alcohol use while 50.8% of grade 12 students reported alcohol use. Overall, only 36.1% of grade 12 students across

10 Canadian provinces reported that they were not currently using any substances (i.e. alcohol, tobacco, marijuana, or illicit drugs). Of additional concern is that the questions in their survey regarding alcohol were based solely on binge drinking, not occasional alcohol consumption. These authors also reported that alcohol use was found to almost always occur in combination with other substances such as marijuana, cocaine, or tobacco (Leatherdale & Burkhalter, 2012). In another study of 6,172 adolescents aged 12-14 years from the province of Ontario, 1 out of 25 adolescent participants reported binge drinking at least once in the previous 12 months (Fuller-Thomson, Grundland, Sheridan, & Sorichetti, 2014).

Of additional concern are the findings that adolescents who report using alcohol also report having established beverage preferences and engaging in high-risk drinking patterns (Siegel, Naimi, Cremeens, & Nelson, 2011). For example, for adolescents in grades 9 through 12, 43.8% of those who reported drinking within the previous 30 days preferred drinking hard liquor over beer, wine, coolers, or other alcoholic beverages (Siegel et al., 2011). Siegel and colleagues (2011) also found that those who reported a preference for liquor also reported engaging in high-risk alcohol use, and engaged in other high-risk activities such as drinking and driving, having sex without a condom, and having sex with multiple partners.

Marijuana

Describing high-risk marijuana use. Despite the emerging movement in various North America regions towards the legalization of marijuana for medicinal purposes, it is still predominantly considered an illegal substance. However, this does not deter individuals from participating in marijuana usage. According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2015) marijuana is the most frequently used drug, after alcohol and tobacco. Possible, but not as currently well-researched consequences of marijuana use include

deficits in everyday cognitive tasks such as reading (Shrivastava, Johnston, & Tsuang, 2011). Some research findings point to the substantial relationship between marijuana use and an increased risk of developing schizophrenia, specifically among those individuals who are already especially vulnerable to the possibility of developing schizophrenia; marijuana can also increase the severity of the symptoms of an existing schizophrenic disorder (Hall & Degenhardt, 2000).

According to the DSM 5, a Cannabis Use Disorder occurs when there is a "problematic pattern of cannabis use" (American Psychological Association, 2013, p, 509) that occurs over the course of a year and also includes the presence of at least two additional diagnostic criteria such as cravings for cannabis, continued use of cannabis despite it causing significant problems in an individual's social and professional endeavors, and need for consumption of greater amounts of cannabis to obtain the same effects (American Psychiatric Association, 2013). However, unlike Alcohol Use Disorder, there is no specified amount of cannabis consumption that is outlined to delineate a definition of what is considered problematic use by quantity. As such, there are also no universally agreed upon definitions to explain the difference between 'heavy' marijuana use and 'regular' marijuana use.

Immediate physiological effects of marijuana include distorted perception, cognitive impairments such as problem solving, and various motor coordination impairments (SAMHSA, 2015). Although researchers continue to debate the evidence of impairment due to marijuana use, Filbey and colleagues (2014) found that long-term heavy marijuana users do have reduced orbitofrontal cortex grey matter and lower structural connectivity. Similarly, other researchers have reported physiological effects of marijuana use such as impaired psychomotor function, changes in blood pressure, and self-reported increase in feelings of anxiety (Desrosiers, Ramaekers, Chauchard, Gorelick, & Huests, 2015). Some researchers have also described

functional consequences—individuals who regularly use marijuana are at greater risk of workplace injury (Macdonald et al., 2010), lower academic effort and motivation, and lower grade point average (Phillips, Phillips, Lalonde, & Tormohlen, 2015). Gruber, Pope, Hudson, and Yurgelun-Todd (2003) found that former heavy users of marijuana as a group have a lower college completion rate and report a household income average that hovers just above the poverty line. Moreover, participants in their study reported that they believed their heavy marijuana use negatively affected their physical and mental health, as well as their social lives (Gruber et al., 2003). Shrivastava and colleagues (2011) suggest that, based on their research, adolescents are at greater risk of more severe consequences of heavy cannabis use due to exposure to marijuana during critical stages of adolescent brain development (see also Canadian Centre on Substance Abuse, 2014).

Prevalence of marijuana use. Marijuana use that occurs during adolescence has been found to be associated with negative future outcomes such as reduced high school completion and increased risk of later drug dependence (Macleod et al., 2004; Silins et al., 2014), as well as high-school sexual activity (Poulin & Graham, 2001). Although marijuana is an illegal substance, 48.6% of youths between the ages of 12 and 17 reported that it would be 'easy' to 'very easy' for them to have access to marijuana if they wanted it (National Survey on Drug Use and Health, 2013). In 2013 Canadian youth reported higher marijuana use than any other students in developed countries (United Nations Children's Fund, 2013). Marijuana is the most frequently used illegal substance by adolescents (Canadian Centre on Substance Abuse, 2014). The recent Canadian Tobacco, Alcohol and Drugs Survey (CTADS) found that in 2013 alone, youth reported using marijuana almost three times as frequently as adults over the age of 25 (Health Canada, 2013).

Leatherdale and Burkhalter (2012) found that about 20% of adolescents reported current marijuana use, with males more likely to report marijuana use than females. As with high-risk alcohol use, they also identified a significant increase in reported current usage by grade. As such, 3.3% of grade 7 students in their study reported current marijuana use while 29.1% of grade 12 students reported current marijuana use.

Sexual Activity

Describing high-risk sexual activity. Examples of high-risk sexual behaviour include engaging in unprotected oral, anal, or vaginal sex, beginning sexual activity at a young age (i.e. adolescence), having multiple sex partners, having sex with a high-risk partner, having sex with someone who has injected drugs, and being a sex trade worker (Government of Alberta, 2014; Slaymaker, Walker, Zaba, & Collumbien, 2004). Some of the possible short-term health related consequences of engaging in high-risk sexual behaviour are contracting sexually transmitted infections (STI's) such as Chlamydia (Peterman, 2014).

There are also many possible long-term health related consequences of high-risk sexual behaviour such as contracting viruses like Hepatitis, Herpes Simplex Virus (HSV), or Human Immunodeficiency Virus (HIV) (Slaymaker et al., 2004), as well as other secondary health risks associated with contracting an STI such as cervical cancer, which can be caused by Human Papilloma Virus (HPV) (Borruto & De Ridder, 2012) or Pelvic Inflammatory Disease (PID), which can be caused by Chlamydia or Gonorrhea that has been undiagnosed and therefore untreated for an extended period of time (Brunham, Gottlieb, & Paavonen, 2015). Along with these short and long-term health consequences are potential social and emotional consequences such as dealing with an unplanned pregnancy, coping with the impact on a relationship when an STI is contracted, or when the individual has a pervasive infection like Herpes that they have to

divulge to their partner. In addition to the social and emotional consequences is the negative social stigma attached to having, or spreading, an STI regardless of whether it is a temporary or long-term infection (Foster & Byers, 2013; Public Health Action Support Team CIC, 2011; Wong, Chan, Boi-Doku, & Mcwatt, 2012).

Prevalence of high-risk sexual activity. Some individuals view adolescent sexual activity as not dangerous in of itself, but the high-risk sexual behaviours that increase an adolescent's risk of pregnancy, contracting an STI, or experiencing violence of a sexual nature as dangerous (Feldstein & Miller, 2006). In Boyce and colleagues' (2006) Canada-wide adolescent sexual health study they found that 23% of grade 9 males and 19% of grade 9 females reported having sex, while 40% of grade 11 males and 46% of grade 11 females reported having sex. Overall, 15-16.5% of females and males who have reported having sex also reported having four or more sexual partners. At last intercourse, 10% of grade 9 males and 8% of grade 9 females reported not using a condom or other form of birth control while 5% of grade 11 males and 6% of grade 11 females reported not using a condom or other form of birth control. Additionally, among females in particular, as reports use of birth control increased, reported use of condoms decreased. This suggests female adolescents are focused more on pregnancy prevention than STI prevention. Furthermore, 73% of males and 50% of females reported that they were under the influence or drugs or alcohol during their last sexual encounter (Boyce et al., 2006).

In the Public Health Agency of Canada national survey on "The Health and Well-being of Canadian Youth and Young Adults" in 2009, approximately 20% of 15 year olds, 40% of 16 year olds, and 50% of 17 year olds reported having sexual intercourse. Meanwhile rates of Chlamydia among 15-19 years olds per 100,000 is 2,114, and rates of Gonorrhea among 15-19 year olds per 100,000 is 207. With regards to rates of teen pregnancy, 14.3 teen pregnancies

occur per 1000 15-19 year olds. To put this into perspective, in 2007, two years prior to the "Health and Well-being of Canadian Youth and Young Adults" survey (Public Health Agency of Canada), 31% of the Canadian population was comprised of children and adolescents; 2.2 million were between the ages of 15 and 19 (Statistics Canada, 2008).

The above discussion of high-risk behaviours associated with alcohol, marijuana use, and sexual activity highlight why effective prevention is important. There are primary physiological, psychological, and emotional consequences that can impact individuals who engage in these behaviours. However, there is also a ripple effect of these consequences that are detrimental not only to the individuals engaging in the high-risk behaviours but also to the people in their immediate social circle, and society at large. The consequences of engaging in high-risk behaviours can range from interpersonal, to financial, to societal (Reyna & Farley, 2006). Of tremendous concern is that there are adolescents that engage in these high-risk behaviours, and are therefore at risk of establishing unhealthy sexual behaviours and substance abuse habits that can follow them for the rest of their lives, along with the potential consequences of engaging in these behaviours.

High Risk Behaviour

Engagement in any form of high-risk behaviour can have profound and far-reaching consequences for individuals that engage in these behaviours, as well as those who are connected to those who engage in these behaviours. Some of these behaviours, along with their consequences, can last many years and possibly even a lifetime. It is noted that many adolescents do not intentionally or consciously participate in high-risk behaviours, and may even intend not to engage in high-risk behaviour, yet in practice they are doing the opposite (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; Reyna & Farley, 2006). In contrast, others may consciously

engage in high-risk behaviour for various reasons. Reyna and Farley (2006) explain that an adolescent's perception of the likelihood of consequences can play a significant role in the continuation or stoppage of participation in high-risk behaviour, and can be dependent on whether or not an adolescent has already experienced some degree of some form of consequence—such as contracting an STI from having unprotected sex—as a result of their behaviour. Adolescents rate themselves as being at lower risk of consequences from high-risk behaviour in comparison to their peers, but at greater risk of consequences from high-risk behaviour than adults (Reyna & Farley, 2006). They also overestimate their reports on the frequency with which they believe their peers are participating in high-risk activities (Prinstein & Wang, 2004). In order to enrich our understanding of adolescent high-risk behaviour it is valuable to explore some proposed explanations as to why adolescents participate in these activities.

Rational for High Risk Behaviour in Adolescents

The alarming prevalence of high-risk youth behaviour and the potential negative impacts associated with alcohol, sex, and marijuana use, have motivated researchers to examine why this is happening during this crucial period of development. In particular, researchers have suggested that the high-risk behaviour that adolescents participate in is strongly correlated with neurobiological development, and their decision-making. Additionally researchers have identified parenting style, a history of abuse, and adolescent social structures as also contributing to the likelihood adolescent high-risk behaviour. Uri Bronfenbrenner's ecological systems theory provides a theoretical framework from which to consider the possible factors that may contribute to the occurrence of adolescent high-risk behaviour. Ecological systems theory considers: (a) a child's immediate environment (microsystem), such as home, school, or their own biological

make-up; (b) the relationship between environments in the microsystem (mesosystem) such as parent involvement in their child's schooling; (c) the effects of outside influences on systems within the mesosystem (exosystem), such as parents' profession, or school board the child's school belongs to; and (d) the influences of the larger culture (macrosystem) (Lightfoot, Cole, & Cole, 2013). Although these systems have separate definitions, each of them influences the other to the extent that, at times, there may not be clear boundaries outlining which factors belong to which system. Although the discussion below about possible causes of adolescent high-risk behaviour explores influences largely from within the microsystem, any relationship between each of these systems would also be considered part of the mesosystem. Discussion about school-based risk prevention and risk reduction initiatives, as well as the regulation of educational content through the Alberta Program of Studies, would be considered part of the mesosystem as well.

Developmental perspective. Spear (2002) points out that the adolescent brain goes through "progressive and regressive changes" during development (p. 72). As an example, Martin and colleagues (2002) reported that the propensity for adolescents to engage in high-risk behaviours could be attributed to an escalation in sensation seeking behaviours stemming from hormonal fluctuations that occur during puberty. Other researchers examining substance use have found that adolescents who come from families with a history of substance abuse, who have not yet participated in drinking alcohol themselves, do show pre-existing differences in neural structure and function (Schweinsburg et al., 2004; Silveri, Rogowska, McCaffrey, &Yurglen-Todd, 2011; Squeglia, Jacobus, & Tapert, 2014). Squeglia and colleagues (2014) believe that these findings suggest that the neural and structural differences are a result of the interaction between genotypes and the environment that put some adolescents at a greater risk for substance

abuse. This also suggests that brain development and function alone cannot effectively explain why adolescents engage in high-risk behaviours. Other causes, such as family environment, also need to be considered in order to have a more complete understanding of the complexity with which high-behaviour emerges in adolescents.

Another developmentally based theory aimed at explaining adolescent high-risk behaviour is fuzzy trace theory. This theory proposes that the ability to make decisions emerges from the meaning attributed to simple mental representations ('fuzzy' recollections referred to as gists) and not explicit detailed memories of previous learning or events (Brainer & Reyna, 1990; Rivers, Reyna, & Mills, 2008). This particular theory can also account for the influence of mood fluctuations and emotional changes that occur during adolescence can have on high-risk behaviour; "risky behaviour increases substantially" (Rivers et al., 2008, p. 109) during times of adolescent emotional change.

Within the context of fuzzy trace theory, as an individual develops so too does their ability to make decisions intuitively—as individuals become more experienced they process less quantitative information to make their decisions and their advanced reasoning is more intuitive in nature (Rivers et al., 2008). Based on this supposition, Rivers and colleagues (2008) claim that adolescents are at transitional stage in which their decision-making about risky behaviour is based on degrees of risk influenced by multiple representations that range from gist-based to very specific. In lieu of this, they tend base their choice on which activity is worth the degree of risk they have inferred, as opposed to not engaging in any of the risky behaviours. Importantly, emotions influence the 'gist' references individuals draw upon in order to make decisions about high-risk behaviour, even when those emotions are not directly related to the situation. Moreover, adolescents may be especially susceptible to the influence positive or negative

emotions have on their based decision making because of their heightened arousal in response to rewards (i.e., social, emotional, or experiential). This interference of emotions can lead to relying too much on experiences or biases, or paying too much attention to irrelevant details about the decision to be made. Rivers and colleagues (2008) note that, "adolescents may be more vulnerable to emotion inappropriately coloring their interpretation of events because the gist of events is difficult for them to grasp" (p. 133).

Parenting influences. Researchers have shown a correlation between low parental monitoring and adolescent engagement in high-risk behaviour (DiClemente et al., 2001; Huebner & Howell, 2003). One such parental monitoring theory that Biglan and colleagues (1990) use to explain adolescent high-risk behaviour—which they refer to as 'anti-social' behaviour in their article—is Patterson's theory of coercive family processes (as cited in Biglan et al., 1990, p. 247). These authors summarize this theory in the context of 'anti-social' behaviour as being a great possibility when parents "(a) use coercive discipline practices, (b) fail to monitor their children's activities, (c) fail to support prosocial behaviour [*sic*], and (d) are not skilled at discussing problems with their children" (Biglan et al., 1990, p. 247). Biglan and colleagues (1990) found that in families where parental availability was limited, adolescents engaged in more sexual risk taking in general, and there was reduced condom usage among sexually active adolescents. In contrast to this, they also found that parental support was consistently positively associated with reduced risky sexual behaviour among adolescents.

Similarly, Ary, Duncan, Duncan, and Hops (1999) found a connection between unsupportive and inattentive parenting and increased possibility of adolescents engaging in high risk behaviours, as well as increased possibility of adolescents choosing peers whom engage in high-risk behaviours. Luster and Small (1994) came across similar findings in their study.

Among Luster and Small's (1994) participants, those who engaged in high-risk behaviours had minimal parental support and monitoring. They found these adolescents had higher rates of abuse, and poor relationships with their parents. Ryan, Jorm, and Lubman (2010) showed that the parenting variables of parent modeling, parent-child communication and relationship quality, and parent involvement were all strong predictors of delayed alcohol initiation among adolescents.

History of trauma. Alternatively, adolescent high-risk behaviour can also be attributed to stemming from trauma such as exposure to violence, physical abuse, or sexual abuse, or some combination of these three traumatic experiences. Working from a national sample of 3,907 participants, Kilpatrick and colleagues (2000) found that childhood trauma is correlated with adolescent high-risk behaviour. The researchers found that adolescents who were exposed to violence (directly and/or observed), or were victims of assault, had a "consistently elevated" (p. 24) risk of substance abuse or dependence (Kilpatrick et al., 2000). They also found that 10% of adolescents 17 years of age with substance abuse or dependence issues, and experiences of violence in the year prior to the study had increased risk of problem substance use within the following 12 months. Additionally, post-traumatic stress disorder increased the risk of marijuana and hard drug use and abuse (Kilpatrick et al., 2000). Importantly, being a witness to violence as a child or adolescent was one of the strongest risk factors for an adolescent substance use disorder, and adolescents who experienced some form of victimization (sexual or violence) were more likely to begin experimenting with substances at an earlier age than those who had not experienced any form of victimization (Kilpatrick et al., 2000).

In regard to females in particular, researchers highlight the increased chance of high-risk sexual behaviour, delinquency, and post-traumatic stress disorder when early childhood trauma has occurred (Smith, Leve, & Chamberlain, 2006). In addition, Johnson and Johnson (2013)

found that the more severe the sexual trauma a woman experiences, the more frequently this woman will report participating in high-risk sexual behaviours, and the more likely she is to engage in high-risk substance abuse. It is theorized that the increased use of drugs and alcohol among individuals who have been victims of childhood sexual abuse may be a way for those individuals to cope with their emotions associated with the trauma, as well as to mitigate their negative feelings associated with sexuality and sexual encounters (Wells et al., 2015). Consequently, the use of drugs and alcohol as a coping mechanism for past trauma may influence the pervasiveness of sexual risk taking due to "impaired judgment and risk negotiation abilities" (p. 2) that occurs during intoxication (Wells et al., 2015).

Social context. Other researchers have used the reputation enhancement theory to explain adolescent high-risk behaviour. This theory proposes that adolescents have a particular social identity that they choose to portray and consequently choose peers and activities that are congruent with the identity that they are trying to portray (Emler, 1984; Odgers, Houghton, & Douglas, 1996). Odgers and colleagues (1996) use reputation enhancement theory to explain why high school aged students use drugs and alcohol; they state that these adolescents use substances "as a means of attaining a Non-conforming [*sic*] reputation" (Odgers et al., 1996, p. 1021). It also noteworthy that Odgers and colleagues (1996) discovered gender differences in their findings; males tended to prefer non-conforming reputations while females tended to prefer conforming reputations (Odgers et al., 1996). Interestingly, and perhaps an opportunity for further research, it is not clear to whom exactly adolescents are choosing to conform.

From this brief review of some explanations for adolescent behaviour, it is clear that there is not a single cause or theory to be advanced. Instead, it is evident that adolescent behaviour is a complex interaction between multiple factors. Moreover, these factors are varied

and individualized, and therefore limit our ability to predict whether or not an adolescent is going to engage in some form of high-risk behaviour. At times, behaviour that may appear unpredictable may actually be a reflection of our present lack of understanding of adolescent behavioural and emotional functioning. That said, researchers have provided insights into possible internal risks (developmental stage) as well as external risks (family and peer factors) that may elevate the likelihood. It is this information that has formed the foundation of prevention initiatives geared towards reducing the risks and supporting adolescents making healthy life choices.

School Based Prevention Initiatives

Schools are one setting in which prevention initiatives can be implemented. There are a variety of approaches for addressing adolescent sexuality and substance use. Programs can range from promoting abstinence—from sex as well as substances—to encouraging safe sex practices, to teaching strategies for handling situations in which high-risk activities are occurring. However, some researchers are concerned about current approaches to teaching adolescents about the choices and consequences associated with high-risk behaviours:

> Opinions about proper solutions to the problem of unhealthy adolescent risk taking are plentiful, ranging from abstinence education to higher legal drinking ages. However, the public and policymakers rarely make use of the scientific literature on risky decision making in adolescence, and, as in many areas of human behaviour [*sic*], prevention and intervention programs are generally not based on such evidence (Reyna & Farley, 2006, p. 2)

In addition to this, there is research about sexual health and substance use prevention education that is far from promising. For instance, a meta-analysis of 370 randomized control trials on school-based preventive interventions for adolescent alcohol use showed that effects for up to one year after the interventions are positive, but small (Strom, Adolfsen, Fossum, Kaiser, & Martinussen, 2014). The authors of this meta-analysis argued that small effects sizes still matter. However, in 2007 there were 2.2 million adolescents between the ages of 15 and 19 in Canada (Statistics Canada, 2008), and with an adolescent population of this magnitude the need for interventions that have a greater than 'small' impact becomes relevant. Moreover, the concern for the current state of high-risk behaviour prevention programing is further supported by the above-discussed prevalence with which youth continue to engage in high-risk behaviours, and suffer consequences from their engagement in those behaviours.

Another example of general prevention programming criticism comes from Prista and Rosenberg's (2010) research; in their study, over two thirds of Grade 11 and 12 students reported that they would likely not use cognitive behavioural strategies such as telling on their peers, being aggressive in their refusal, or telling some sort of lie to get out of the situation to decline offers for drugs or alcohol from their peers. They found that the two most frequent strategies their respondents reported willingness to use were to say "no" or simply decline the offer. Their findings suggest that educational initiatives directed towards an extensive focus on the variety of ways adolescents can deal with situations when they are offered drugs or alcohol may not be a fruitful endeavour. This is further supported when considering that regardless of the fact that adolescents are being taught how to effectively handle difficult situations involving invitations to use drugs and alcohol, researchers find that many of them are still choosing to engage in these

high-risk behaviours. Further inquiry into the usefulness of diverse response options versus the traditional "just say no" approach may prove valuable to future programming.

Lastly, after working with a series of small focus groups to discuss the education needs of sexual health, MacDonald and colleagues (2011) established that adolescents had meaningful input suggesting that they are not satisfied with the current status of their health education. MacDonald and colleagues (2011) reported that adolescents recommend that Canadian sexual health education start earlier, that sexual health be an ongoing topic and not just something briefly covered in class, and that what is currently being taught around sexuality is too serious and extreme. The authors conclude from their study that there is a need for curriculum to be more relevant to adolescents and their experiences, and that there be more targeted training and support for teachers responsible for disseminating information about sexuality. The feedback from the participants in this study also suggests that there is a gap between what is supposed to be being taught, and where adolescents stand on the topic in terms of the perspectives and behaviours.

Alberta education policy. The Alberta Learning Program of Studies (POS) contains the specific learning objectives within the Health and Life Skills/Career and Life Management curriculum that need to be met. It is within the Health and Life Skills/Career and Life Management curriculum that learning objectives pertaining to sexual activity and substance use are communicated. General Outcomes aim at teaching students to make informed decisions that allow them to maintain health and safety for themselves and others, maintain responsible, healthy, and safe relationships, and make choices regarding their future goals, make responsible financial decisions, and manage personal well-being (Alberta Learning, 2002a; 2002b). The POS is also broken down even further to address specific objectives. Table 1 highlights almost all of

the POS specific learning objectives teachers must follow when planning their lessons on sexuality for students in grades 7-9.

Table 1. Program of Studies - Sexual Health Learning Objectives.

Grade	*Specific Learning Objective*
7 (W-7.13)	*Examine the influences on personal decision making for responsible sexual behaviour (p. 12).*
7 (W-7.14)	*Examine abstinence and decisions to postpone sexual activity as healthy choices (p. 12).*
8 (W-8.12)	*Identify and describe the responsibilities and consequences associated with involvement in a sexual relationship (p. 12).*
8 (W-8.13)	*Describe symptoms, effects, treatments and prevention for common sexually transmitted diseases; i.e., chlamydia, HPV, herpes, gonorrhea, hepatitis B/C, HIV (p. 12.).*
8 (W-8.14)	*Identify and describe basic types of contraceptives; i.e., abstinence, condom, foam, birth control pills (p.12).*
9 (W-9.12)	*Determine "safer" sex practices; e.g., communicate with partner, maintain abstinence, limit partners, access/use condoms/contraceptives properly (p. 12).*
9 (W-9.13)	*Identify and describe the responsibilities and resources associated with pregnancy and parenting (p. 12).*
9 (W-9.14)	*Develop strategies that address factors to prevent or reduce sexual risk; e.g., abstain from drugs and alcohol, date in groups, use assertive behaviour (p. 12).*

Table 2 highlights almost all of the POS specific learning objectives teachers must follow when planning their lessons on substance use/abuse for students in grades 5-9.

Table 2. Program of Studies – Substance Use/Abuse Learning Objectives.

Grade	*Specific Learning Objective*
5 (W-5.6)	*Examine and evaluate the impact of caffeine, alcohol and drugs on personal health/wellness; e.g., physical, emotional, social (p. 7).*
6 (W-7.14)	*Examine and evaluate the risk factors associated with exposure to blood-borne diseases—HIV, AIDS, hepatitis B/C; e.g., sharing needles, body piercing, tattooing, helping someone who is bleeding, being sexually active (p. 7).*
7(W-7.6)	*Analyze social factors that may influence avoidance and/or use of particular substances (p. 8).*
8 (W-8.6)	*Analyze possible negative consequences of substance use and abuse; e.g., fetal alcohol syndrome, drinking and driving (p.8).*

9(W-9.6)	*Analyze addictions; e.g., stages, kinds, and resources available to treat addictions (p.8).*

Beyond the above outlined learning objectives, the teachers determine the details of how and to what extent this content is addressed. Teachers have access to in-school resource materials including lesson plans and teaching materials, as well as online through websites like 'teachingsexualhealth.ca' put on by Alberta Health Services. Teachers have the freedom to choose which resources they will use, and how they will teach the subject matter. It is also worth noting that parents have the option of having their children excluded from all lessons related to human sexuality. Further, unlike the Kindergarten to grade 9 Health and Life Skills Program, the grade 10-12 Career and Life Management POS does not have specific objectives regarding sexuality and substance use. Teachers at the senior high level are encouraged to make use of community-based agencies, such as WRaP, Alberta Health Services, Sexual Assault Centre of Edmonton, and Pride Edmonton to aid in planning and implementation of educational programming that supports student learning in these areas (Alberta Health Services, 2015; Alberta Learning, 2002a). In essence then, although Alberta Education highlights specific learning outcomes about sexuality and substances use, the depth of the content, delivery of the content, and quality of the delivery of the content is dependent on the particular school board, the philosophy and resources of the given school, and individual teachers teaching the subject matter.

Research Questions and Hypothesis

Above and beyond what adolescents are being taught at school, they are also bombarded by unfiltered information about sex, drugs, and alcohol from a variety of credible and non-credible sources (Villani, 2001). Access to a variety of unregulated content through social media

and other avenues means that youth can access information that not only has the potential to be grossly inaccurate, but might also have an significant influence the development of their personal values and beliefs, and their decisions pertaining to sex, drugs, and alcohol (Strasburger, Jordan, & Donnerstein, 2010). Additionally, the peer group they belong to may also easily influence adolescents' beliefs and attitudes about high-risk behaviours (Tze, Li, & Pei, 2012). This points to the need to ensure that adolescents are armed with the most up-to-date educational information about their sexual health, and to inform the decisions they make about their sexuality and substance use from resources they can trust.

As earlier noted, adolescents are engaging in, and experiencing, the consequences of high-risk behaviours at alarming rates. As such, it is important to safeguard adolescents from negative or inaccurate information regarding their sexual health and substance use. Ideally, parents, teachers, role models, and/or caregivers should provide accurate education and authentic support. In order to provide the right education and support, it is valuable to understand what it is that adolescents currently claim to know and believe, and how they feel about these topics, from their perspective. This information would allow education, caregivers, and policy makers to design and implement differentiated educational paradigms surrounding sex, drugs, and alcohol that the youth will not only be receptive to, but could integrate into their decision making and behaviours as they are faced with challenging situations that put them at risk of making unsafe or unhealthy choices. Additionally, by determining if the perspectives of adolescents change as they progress from junior high to senior high, we may gain insight into which areas educational initiatives are currently influencing accurate perspectives, as well as which areas adolescent perspectives may not be increasing in accuracy, regardless of their exposure to educational initiatives throughout the grades. Therefore, this study aimed to answer the following questions:

1) What do adolescents say they know and believe about marijuana, alcohol, and sex?
2) Are junior high school students' perceptions about marijuana, alcohol, and sex different from senior high students?
3) What do adolescents say about the education they receive around sexual activity and substance use?

Methods

Participants and Procedures

Participants in this study consisted of junior high school and senior high school students from 7 different schools in Edmonton and surrounding rural communities within the Pembina Hills, Grand Yellowhead, Elk Island, and Edmonton Public school districts. The schools participating in the survey are all partners in the Wellness Resiliency and Partnership program (WRaP). The WRaP program is an in-school program of 'coaches' whom provide supports for junior high and senior high students who have, or are believed to have, Fetal Alcohol Spectrum Disorder. As part of the WRaP program, the in-school coaches provide support in addressing issues surrounding high-risk activities that youth may engage in. In this study the WRaP coaches played the role of liaison between schools and researchers to ensure implementation of the survey caused minimal disruption in instructional time, and respected the anonymity of the students in the schools. Each coach received one on one verbal instruction on procedures for: negotiating participation in the survey with teachers at the schools; disseminating and gathering assent and consent forms; and, facilitating the completion of the online survey.

A total of 3,012 study information letters and consent/assent forms were dispersed amongst the participating schools; Pembina Hills, Grand Yellowhead, and Edmonton Public Schools required consent forms to be sent home and completed by parents or guardians then

returned to classroom teachers (see Appendix C). Even when parents consented to their adolescent participating in the survey, the adolescent still had the option to opt out should they wish to do so. Elk Island school district used exemption forms, which required guardians to complete and fill out the forms only if they chose for their child not to participate in the survey (see Appendix B). A total of 418 forms were returned for a completion and participation rate of 14%.

The surveys were implemented during instructional time, and during health and wellness classes where possible in order to correspond with the Program of Studies in Health and Life Skills and Career and Life Management, and to respect the sensitive nature of the topics. In order to maintain anonymity of students whom consented to participating in the survey, all students in the class were on school computers during administration of the survey. Those who did not receive parental consent, or declined to participate themselves, were directed to a webpage with links to various school and age appropriate websites pertaining to the subject matter of the survey, or were provided with alternate school related online activities by the WRaP coach, or classroom teacher. Coaches and/or teachers were available in the lab to answer any student questions.

Measures

The 'Youth Prevention' survey was implemented through the online survey software Survey Monkey©. The questions on the survey were adapted from existing youth surveys about high-risk behaviour (for examples see Boyce et al., 2006; Cole, 2003; or Robinson, Price, Thompson, & Schmalzried, 1998) and selected with consideration of curricular objectives from the grade 7 through 12 Health and Life Skills Program of Studies outlined by Alberta Learning. Items on the survey consisted of 20 knowledge-based questions about sex, drugs, and alcohol; 15

attitude-oriented items for clarification of attitudes that may influence their choices; and 15 questions directed towards clarification of adolescents' beliefs pertaining to sex, drugs, and alcohol, for a total of 50 items on the survey (see Appendix D for complete survey). The items can be further differentiated by item type: 1 consent to participate, 3 demographic questions, 31 Likert-type questions, 2 multi-answer questions, 8 single-answer questions, and 5 qualitative questions. The items addressed content that is considered sensitive and somewhat controversial in nature, therefore, in order to respect the dignity of the youth by not being overly intrusive, specific questions about sexual activity, drug use, and alcohol use were worded in a generic manner and did not ask the participants directly about their own behaviours. A page with links where adolescents could get more information about the subject matter of the survey was also included at the end for participants who had more questions, wanted to confirm their own understandings, or chose not to participate in the study but were still interested in the topic.

Data Analysis

The survey consisted of primarily quantitative items with a short qualitative section intended to enrich the understandings of outcomes from the descriptive analysis of the quantitative content. The quantitative data was examined via descriptive analysis by assignment to either junior or senior high groups, and examined in its entirety. Analyzing the data in this manner allows for identifying similarities or differences by group, and allows for identifying overall trends. The qualitative data was reviewed via thematic analysis in order to identify themes relevant to the research questions. During the preliminary analysis and data cleaning 25 surveys were removed and consequently excluded from analysis due to a) offensive responses in the qualitative data making the validity of these surveys questionable in their entirety, b) participants lying about their age in the demographics section, or c) items being left blank.

All of the likert-type scale questions were recoded to correspond with the established likert-type scale format. The original 9-point scale was also amalgamated into a 5-point scale to account for the absence in differences between scale points at each end of the scale. As a result of these changes to the scales, numerical response option 9 represent the responses 'strongly agree' 'always' or 'always,' depending on the nature of the question. The numerical response options 7 and 8 were combined to represent the responses 'agree', 'almost always', or 'almost always true,' depending on the nature of the question. Numerical response options 6, 5, and 4, were combined to represent the responses 'don't know' or 'unsure,' depending on the nature of the question, while numerical response options 2 and 3 represent 'disagree', 'almost never' or 'almost never true,' depending on the nature of the question. The numerical response option 1 represents the responses 'strongly disagree', 'never', or 'never true'. In order to best answer the research questions in this study descriptive statistics were used.

Results

Participant Demographics

Of the 418 adolescents that consented to participate in the survey, 393 provided their grade level, and 393 reported their gender. From those who reported their grade level, 37.9% (n=149) were in grade 7, 22.1% (n=87) were in grade 8, 8.9% (n=35) were in grade 9, 7.8% were in grade 10 (n=33), 10.4% (n=41) were in grade 11, and 12.2% (n=48) were in grade 12. Overall, 49% (n=194) were female while 51% (n=199) were male; 68.9% of students were in grades 7 through 9 (junior high; n=271), and 31.0% of students were in grades 10 through 12 (senior high; n=122).

What Adolescents Say They Know, and Believe About Alcohol and Marijuana

Based on a common myth that some drinks contain more alcohol than others and therefore individuals can manage their drinking through their choice of beverage, students were asked about which popular alcoholic beverages contained the most alcohol (and also provided with the option that 'all have the same amount'). About 70% of adolescents sampled believe that a 'shot' of rum/vodka/tequila has more alcohol than a glass of wine or beer. Moreover, 34.3% (n=135) disagree or strongly disagree with the statement that 'getting drunk is the same thing as binge drinking'.

As shown in Table 3, the adolescents sampled reported that being under the influence of alcohol and marijuana affects their ability to make safe decisions. This is somewhat more pronounced at the junior high level than at the senior high level. However, almost a quarter of senior high students are unsure about the affect marijuana has on their ability make safe decisions. In general, most junior high students adolescents believe they cannot be in control of themselves if they are drunk while almost half of senior high students are unsure about this. Almost a quarter of senior high students believe they can still be in control of themselves when they are high, whereas just under half of junior high students believe the same.

Table 3. Substance Use, Decision Making, and Self Control

	Percentage of Agreement							
	Alcohol Affects Safe Decisions		Marijuana Affects Safe Decisions		Be Drunk and Have Control		Be High and Have Control	
JH (n=265); SH (n=121)	JH	SH	JH	SH	JH	SH	JH	SH
Strongly Agree	59.2	39	59.2	30.6	5.7	6.6	9.1	20.2
Agree	20.4	30	18.9	28	22.3	19.8	11	31.1
Unsure	8.7	16.7	7.1	24.7	29.1	40.5	23.9	22.7
Disagree	2.2	9.2	3.3	6.6	9.8	14	19	11.7
Strongly Disagree	9.4	7.5	12.5	16.5	33.2	19	37.1	14.3

JH=Junior High SH=Senior High

Approximately 70% of adolescents sampled agreed to strongly agreed that they have all the information they need to drink responsibly, and 65% of adolescents sampled agreed to strongly agreed that they have all the information they need to make safe decisions about drugs. When asked if it is considered more normal as a teenager today to drink alcohol than to not drink alcohol, almost 50% of adolescents sampled agreed to strongly agreed while only 15% of adolescents' sampled disagreed to strongly disagreed with this.

What Adolescent Say They Know and Believe About Sexual Activity

Adolescents participating in this survey were asked about their knowledge regarding birth control and safe sex practices. The adolescents that completed this survey claimed to know more about how to get condoms than birth control, as shown in Table 4. Senior high students claimed to know a lot more about how to get condoms and birth control than junior high students. However, almost three quarters of senior high students know about how to get condoms while just over a quarter of them know how to get birth control. When presented with the statement that teens need parental consent to take birth control, half reported this statement as true while the other half reported this statement as false.

Table 4. How much do you know about how to get birth control versus condoms?

	Percentage Agreement					
	A lot		A little		Nothing	
JH (n=266); SH (n=119)	JH	SH	JH	SH	JH	SH
How much do you know about how to get condoms?	32.5	68	38.9	25.4	28.7	6.6
How much do you know about how to get birth control?	10.8	33.6	48.7	46.7	40.4	19.7

JH=Junior High SH=Senior High

Both junior and senior high students sampled were divided in their beliefs about who is responsible for birth control and condoms, as shown in Table 5. Approximately half of both groups believed that males are always or almost always responsible for carrying condoms if they

plan on having sex while just over a quarter of both groups sampled were unsure. When asked if females are responsible for carrying condoms if they plan on having sex, about a quarter believed they are always or almost responsible for carrying condoms while half of both groups sampled responded that they were unsure. When asked if females are responsible for being on the pill if they plan on having sex, about half of both groups chose always or almost always while over a quarter were unsure, with more junior students' sampled being unsure than senior high students sampled.

Table 5. Males/Females responsible for condoms/pill if they plan on having sex

Percentage of Agreement										
	Never		Almost Never		Unsure		Almost Always		Always	
JH (n=261); SH (n=121)	JH	SH	JH	SH	JH	SH	JH	SH	JH	SH
Males Condoms	3.4	5.8	5.7	4.2	38	38	21.4	18.2	31.4	33.9
Females Condoms	10.3	9.1	13.3	8.3	48.1	45.5	12.6	16.5	15.6	20.7
Females Pill	6.2	8.2	5.8	4.1	40.4	33.6	20	27.1	27.7	27

JH=Junior High SH=Senior High

According to sampled junior high adolescents, the top three sources of the best information when making decisions regarding sexual activity is first their parents, followed by their teachers, then their friends. Meanwhile, senior high students sampled rated friends first, followed by parents, then siblings (see table 6 below).

Table 6. Who do you think provides you with the best information when you are making decisions about sexual activity?

Percentage of Agreement				
	Junior High		Senior High	
	n	%	n	%
Friends	77	28.6	78	63.9
Boyfriend/girlfriend	33	12.3	46	37.7
Parents	167	62.1	64	52.5
Teachers	88	32.7	23	18.9
Stuff you Read Online	49	18.2	29	23.8
Older Siblings	75	27.9	48	39.3
Cousins	40	14.9	23	18.9

Overall, 58% of adolescents sampled agreed to strongly agreed that they have all the information they need to avoid an unplanned pregnancy, while 26.5% were unsure and 15.6% disagreed to strongly disagreed that they have all the information they need. When asked if it is considered more normal as a teenager today to engage in sexual activity than to not engage in sexual activity, 48.2% agreed to strongly agreed with this statement, 37.6% were unsure, and 14.2% disagreed to strongly disagreed that engaging in sexual activity is more normal today.

Adolescents sampled were asked to choose which reasons they believed youth choose to have sex. As shown in Table 7, both junior and senior high students reported curiosity as the number one reason youth choose to have sex, followed by losing their virginity second, and love as the third reason youth choose to have sex; these were all followed (in order) by pressure from their partner, the influence of drugs or alcohol, to get into a relationship, and loneliness.

Table 7. What is the number one reason you think youth choose to have sex?

	Percentage of Agreement			
	Junior High (n=235)		Senior High (n=105)	
	n	%	n	%
For Love	42	17.9	15	14.3
Curiosity	71	30.2	31	25.4
Influence of drugs/alcohol	17	6.3	7	6.7
Loneliness	9	3.8	4	3.3
To get into a relationship	12	5.1	9	7.4
To lose their virginity	53	22.6	29	23.6
Pressure from their partner	31	13.2	10	9.5

Adolescent Perspectives: What do adolescents say about the education they receive on sexual activity and substance use?

Participants also responded to open ended survey questions to provide their perspective on both the topics and their prevention education regarding sexual health and substance use, to inform prevention initiatives. Adolescents' responses were categorized into three themes that describe their perceptions of their current educational needs and recommendations for the future:

(1) we know there are consequences; (2) we want to understand the consequences; and, (3) we want to learn from someone we trust.

We know there are consequences. A primary theme identified from the first question about what participants think are the most important issues regarding sex, pregnancy, drugs, and alcohol for adolescents today is the theme of 'consequences from high risk behaviours that impact the quality of life'. As an example of this, one youth stated, "people are way too young to get into these problems and mess up their lives". This broad statement acknowledges that, in generic terms, consequences of engaging in high-risk behaviours can have detrimental affects on their lives. Additionally, as these participants put it, "it's all fun and games when really these topics can ruin your life" and "it affects the rest of their life and can mess up their future". These responses, as well as many others that were similar in nature, focus on the consequences of high-risk behaviours. Regardless of the nature of the consequences, the overall message from the participants is that the issue is not that what they are doing is wrong, but that what they are doing can lead to negative consequences—often consequences that are more abstract and future oriented. Furthermore, given the awareness of consequences that was illuminated by the frequency of consequential thinking communicated in participant answers, it is clear that adolescents have a strong understanding about the possibility of consequences of high-risk behaviours.

We want to understand the consequences. Adolescents reported that they need prevention content to be taught in a manner that is forthright and comprehensive, including evidence based content that draws on research in conjunction with a real world context. For example, one participant answered that youth need to learn more about, "deeper medical studies like what alcohol does to brain cells". Another explained "[…] they should show us how it can

really ruin your life, like show us people and TV shows about abuse of drugs or alcohol to scare us out of it, or show us real life events that have happened to people…". These two participant responses emphasize the need for more detailed educational content that is uncensored and honest. This theme is further evidenced with comments such as:

> It seems like sometimes health classes have advice that teens wouldn't use because it sounds pretty lame when you say it talking to someone. A good idea would be to actually have a teenager or someone who's gone through the consequences to speak to a health class learning about sexual health.

This comment, the examples above, and many others point to the adolescent perspective that they really do want to learn about their sexual health and drug and alcohol abuse. However, they want to learn it in a manner that addresses the topic, the consequences, and the science behind all the information being presented them that is extensive and accurate.

We want learn from someone we trust. Adolescents reported that parents, teachers, and people with experience were their top three choices for who they think should be teaching them about sexual health and drug and alcohol abuse. Specifically, they said they would like to learn about these topics from someone they trust and respect. One participant said "really close family or friends who are greatly experienced and make smart choices" while others stated "either a health teacher or parent you are really close with," or "someone trustworthy like a teacher, guardian, or counsellor", and, as one participant noted "…I think we should be taught by a teacher chosen by the students, cause they will feel more comfortable". Other respondents provided answers that pointed to researchers, individuals whom are experts, and those who have direct experience with what they are teaching the students about. These comments highlight that participants would prefer to receive their learning from someone that is knowledgeable in the

subject areas and the therefore worthy of their respect, or someone that they respect and trust because of the nature of the relationship they have with that person.

Taken together, the above three themes establish that adolescents recognize that sexual health and substance use are important topics, and that this topics are especially relevant to them. Moreover, they clearly have strong and thoughtful perspectives on what they believe the issues are, what they think they need to know more about, and whom they think should be teaching it to them. The themes also indicate that adolescents are feeling like they aren't getting the entirety of the information they believe they should be receiving and that they may not be learning it from individuals they consider experts or that they trust enough to learn from about topics of such a delicate and serious nature.

Discussion

The purpose of this study was to explore the perspectives of a sample of Edmonton and area junior and senior high students about sex, alcohol, and marijuana, as well as to explore whether there are differences between the perspectives of junior and senior high youth. The Alberta Program of Studies health curriculum objectives propose that beginning in grade 5 students should be taught the impact of drugs and alcohol on personal wellness, and by grade 9 students should be analyzing the negative consequences of substance use, and abuse. The Alberta Program of Studies health curriculum objectives also propose that sexual health content should begin in grade 7 with responsible sexual behaviour, and by grade 9 should be directed towards developing strategies that address factors to prevent or reduce sexual risk. Therefore it was expected that the senior high youth would provide more accurate perspectives in these areas than junior high youth. Yet in all three areas—alcohol, marijuana, and sexual activity—adolescent knowledge was found to be inconsistent and not always accurate. When comparing junior high to

senior high students sampled there were some inconsistencies as well. There are topics that the senior high students sampled should have been exposed to more of in comparison to the junior high students sampled, based on POS objectives. Therefore, senior high students sampled were expected to have had greater accuracy in their perspectives on these topics than junior high students sampled. However, this trend of growth in accurate perspectives from junior to senior high was not consistently revealed. For instance, perspectives about the effects of marijuana or alcohol from senior high students sampled were actually less accurate than junior high students sampled. In other areas such use birth control knowledge, or reasons adolescents choose to have sex, there were minimal differences between perspectives of junior high and senior high students sampled.

Perspectives on substance use. In terms of substance use, findings from this study reveal that adolescents sampled hold some inaccurate knowledge and beliefs regarding alcohol and marijuana. For example, over half of the adolescents participating in this survey agreed with the belief statement that it was more normal today for adolescents to drink alcohol. With this kind of belief there is a possibility that the prevalence of adolescent alcohol consumption will continue to increase over the coming years.

Additionally, their knowledge/beliefs around alcohol content, responsible drinking, and safe decision making reflect misconceptions that could have a significant impact on use patterns. For example, the majority of adolescents in this study did not know that there is no difference in actual alcoholic content between common beverages. A standard drink (i.e. 6 ounce glass of wine, a bottle of beer, or 1.5 ounce shot of tequila) typically contains 14 grams of alcohol; the difference between each of the beverages, which is usually explained by percentages, is actually the ratio of alcohol to other liquid content within the drink (National Institute of Alcohol Use and

Alcohol Abuse, 2000). Another misunderstanding that may impact use patterns is their inaccurate knowledge about what 'getting drunk' is and its relationship to binge drinking. The Centre for Addiction and Mental Health (2008) explains that binge drinking is the consumption of several drinks on one occasion with the intention or outcome of intoxication; intoxication is, in layman terms, 'getting drunk'. A path of inquiry moving forward may be to explore whether or not these inaccurate understandings are a result of a larger misunderstanding among the general population about safe alcohol use.

Although the majority of adolescents reported that they have all the information they need to drink responsibly, they also report that they believe it is still possible to make safe decisions while under the influence of alcohol or drugs, and even more adolescents report they can still be in control of themselves when they are intoxicated or high; this belief was more pronounced among senior high students than junior high students sampled. This is unexpected because adolescents first learn about substance use in grade 5 (see W-5.6 in Table 2) meaning that by senior high they should ideally know the impact of substance use on their decision making and self control; yet their responses suggest a decline in this knowledge. As such adolescents may be naïve to the neurophysiological affects that occur during alcohol or drug intoxication; effects that impair brain function (Jacabus & Tapert, 2013; Spear, 2002), and the ability to make sensible decisions while under the influence of alcohol (George et al., 2005; Levine & Moreland, 2012). Filbey and colleagues (2014) note that researchers are still seeking to understand the impact marijuana has on decision-making, which suggests that it would be prudent to educate adolescents on the most up-to-date research on the effects marijuana has on physiological functioning (Desrosiers et al., 2015), neurological development (Filbey et al., 2014; Shrivistava et al., 2011), and future academic and life success (Gruber et al., 2003; Phillips

et al., 2015) in order to support informed decision making while research continues to explore consequences of marijuana use.

Perspectives on sexuality. Findings from this study reveal that adolescents sampled have some imprecise knowledge and beliefs around their sexual health as well. Consider that beginning in grade 8, adolescents are expected to learn in detail (i.e. symptoms, effects, treatment, prevention) about STI's, and about pregnancy prevention practices (e.g. abstinence, condoms, birth control, foam, etc.). However, about a quarter of adolescents sampled report that they know 'nothing' about how to get condoms and birth control. Although senior high students in this study reported knowing more about how to get condoms than junior students, almost half of both junior and senior and junior high students reported knowing only 'a little' about how to get birth control. Although condom knowledge is greater among older adolescents, it appears birth control knowledge is still unfamiliar to most adolescents in general. This is an interesting difference because both forms of pregnancy prevention methods are supposed to be taught in grade 8 (see W-8.14 in Table 1). Additionally, about half of adolescents incorrectly believe they need parental consent to obtain birth control. According to the Centre for Public Legal Education (2015) parental consent is not mandatory for an adolescent to receive a prescription for birth control. It is up to doctors' discretion to encourage parental involvement, however, in some cases if the adolescent requests that the parents not be informed of the prescription, this request must be respected. The difference in condom knowledge and birth control knowledge expressed by adolescents sampled suggests that their knowledge in birth control is not retained to the same extent as condoms. Although it is not possible to identify the specific lessons adolescents are receiving in school, according to the POS they should be receiving this content in school at the same time. This difference in knowledge may also be a reflection of greater accessibility of

condoms, especially given that almost half of adolescents sampled believe that they need parental consent to take birth control.

Adolescents participating in this study also appear to have uncertain beliefs about who is responsible for safe sex and pregnancy prevention practices. About half of junior high and senior high students sampled believe that males should be responsible for carrying condoms. Almost half of both junior and senior high sampled are unsure about girls being responsible for carrying condoms, while almost a quarter of both groups sampled chose never or almost never. Meanwhile, over half of junior and senior high students sampled believe girls are responsible for being on the pill. This is of significant concern because condoms are not only meant for prevention of pregnancy but also to prevent the transmission of STI's, something that may be more easily prevented when both genders take responsibility for prevention via carrying condoms—male or female condoms. Given the rate at which at which teen pregnancy occurs, and the prevalence of STI's among adolescents, a noteworthy question to ask is to what extent is their inaccurate knowledge about condoms and birth control use, along with their beliefs about roles of responsibility, informing their decisions about their sexual health and engagement in sexual activity.

There are no differences between junior and senior high reports on why they think adolescents choose to have sex. Grade 7 POS sexual health learning objectives include adolescents being taught about factors that influence their decisions regarding sexual behaviour, and the responsibilities and consequences related to becoming involved in a sexual relationship. Although it is not possible to confirm the specific content related to these objectives, the topic of reasons for having sex would be appropriate to address within these educational objectives. As such, findings from the adolescents sampled on this survey item may suggest that the content

they learned in grade 7 on this topic had a sustained impact on their perspectives throughout junior high and senior high school.

Perspectives on education. As previously mentioned, it is difficult to specify what lessons adolescents are being taught at their respective schools on sexual activity and substance use; findings from this study suggest that there are inconsistencies between adolescent perspectives, and what they are believed to be learning in school. Adolescents sampled have some meaningful perspectives about their education in substance use and their sexual health, which could be helpful to addressing these gaps. Three key themes elucidated from their feedback are: (1) we know there are consequences; (2) we want to understand the consequences; and, (3) we want to learn from someone we trust. The findings in this study about the discontinuity between current educational status and adolescent perspectives are consistent with those found by MacDonald and colleagues (2011). Further research into creating and implementing substance use and sexual health education that is developed in consideration of these discontinuities, and adolescent perspectives, may prove valuable in developing initiatives that can demonstrate measurable success in reducing adolescent high risk behaviour. Initiatives that take into consideration to what extent adolescents already know about the consequences, what additional information about the consequences of adolescent high-risk behaviour should be included in curricular content, and which individuals would be best to educate adolescents on this content could be of significant benefit to prevention education programming.

It also appears that adolescents sampled hold some beliefs that could have a detrimental effect on the decisions they make about sexual activity and substance use. Beliefs are not explicitly highlighted curricular objectives. In one study it was shown that a teacher's personal beliefs about sexuality could affect the nature of the content and delivery of the subject matter

(Iyer & Aggleton, 2013). Research on the impact of teachers' personal values and beliefs on sexual health and substance use education is extremely limited but may be a worthy of pursuit because teachers' personal values and beliefs could be reflected in the content teachers choose to teach, choose not to teach, or how much attention they give to that content. Future research into what extent curricular exposure is influenced by teachers' personal values and beliefs regarding sexual activity and substance abuse may be of substantial benefit for understanding the contributing factors to the existence of these discrepancies between education and adolescent perspectives.

Another noteworthy finding is whom adolescents sampled say they rely on for information about their sexuality. Junior high students in this study reported that the best source of information is their parents, followed by their teachers, then their friends. Senior high students in this study reported the best source of information is their friends, followed by their parents, then older siblings. For senior high students, teachers are rated 5th on this list. These responses can be of concern for a couple of reasons. The first reason is that parents often report being uncomfortable with talking about sexuality with their adolescents (Hu et al., 2012; Sneed, 2008; Walker, 2001). If adolescents do prefer to go to their parents regarding these matters, then it is recommended that parents be armed with the resources and support to ease their discomfort and ensure they are sufficiently informed on up-to-date facts about STI's, pregnancy prevention, and human sexuality.

The second reason their reports are cause for concern pertains to adolescents rating friends as one of the best sources of information about sexual activity. As the outcomes from this survey clearly illuminate, many adolescents sampled are not accurately informed in key pieces of knowledge in this subject area. This means that one of the top two resources they go to for the

best information is a resource that could be providing them with information that is wrong, and therefore potentially harmful to their sexual health. It is also noteworthy to consider that—although the Health and Life Skills/Career and Life Management curriculum delivered by teachers may be a comprehensive delivery model for information on these matters for many adolescents—junior high students in this survey rated parents higher than teachers, and the senior high participants in this survey rated teachers below parents, older siblings, and the internet. Teachers being rated fourth on the list by senior high students sampled may be a reflection of the curriculum guidelines; senior high curriculum mandates that teachers make use of outside agencies to educate adolescents on various topics including sexuality and substance use. However, it is still of concern that friends are rated at the top by both groups given some of the inaccurate perspectives of adolescents sampled in this study.

Limitations

There are several limitations that need to be considered moving forward from the outcomes of this study. The first limitation is reflective of some common challenges that tend to occur when administering anonymous surveys with adolescents. Specifically, it was found that: some participants may not have responded to the survey items honestly even though their identity was kept anonymous; they may have minimized or withheld truthful answers for fear of being identified and forced to face consequences for their answers, whether by their peers, or adults; or they may have inflated their answers so that their responses were either exaggerated or completely untrue. Additionally, the survey items were designed so that participants had the option of skipping over any items they were not comfortable with completing. This flexible response option led to a few of the survey items being left unanswered by a small portion of participants.

The second limitation of this study is the rate of consent of participation in the survey. Only 14% of consent forms were returned. It is unclear whether this low consent to participate rating is reflective of the time of year the survey was held, the timeline between dissemination of consent forms and administration of the surveys, adolescents not sharing surveys with their parents, or parents actually not wanting their children to participate in the survey.

The third limitation of this study was in the timing of administration of the surveys; all of the surveys were completed in May and June of 2014. This time of year in schools is very busy for teachers aiming to finish up curricular content in a timely manner, for preparing students for final exams, and for students in grades 9 and 12 preparing for provincial achievement tests and diploma exams. These factors may have impacted the reasoning behind some schools, and some teacher's, refusal to participate in implementing the survey.

The fourth limitation of this study pertains to the content of the survey itself. Although individuals not explicitly involved in writing the survey reviewed the items for errors, there were still item errors that became apparent post-administration. For example, a few test items were 'double-barrelled,' meaning they inadvertently asked two questions in one. Responses to these kinds of questions can lead to confusion for the participant in choosing the best answer, as well as confusion for researchers when interpreting the answers. Therefore these items had to be excluded from analysis. There were also two survey items that the response option chosen from on the online survey program Survey Monkey© template was not the best answer-type option for interpreting the data later on. For example, an item designated as a multi-response item would have been more meaningful if it had been designed as a single response or rank-ordering response type item. Most of these errors may have been identified and corrected had the survey

been run through a pilot administration or through a group 'think aloud' with the survey items. These item specific issues can be easily addressed prior to future research using this survey.

A final noteworthy limitation in this study can be found within the constraints of the participant sample. Although there are 418 completed surveys representing Edmonton and surrounding area, none of the participating schools were from the Catholic School board, Private Schools, or home schooling programs. Nor are there any schools from districts further north, south, east, or west of central Alberta. As a result of this, the interpretation of the data may be a limited reflection of the knowledge, beliefs, and attitudes of all Alberta adolescents and therefore may be best interpreted as an accurate reflection the knowledge, beliefs, and attitudes of central Alberta adolescents attending junior high and high school in rural and urban public school districts. In addition to this, due to differences in ethics processes in different school districts, some students required explicit consent (a signed consent form) to participate. Other students required exemption forms (a signed exemption form) and, as such, consent was otherwise subsumed within the broader school consent provided at the beginning of the school year. This consent difference could impact sampling as the first group (explicit consent) might be comprised of students or parents motivated to participate in research, and the second group (those not exempt) may have seen removal of adolescents if parents or students were uncomfortable with the topics or research in general. Future research with this survey could address this issue by identifying which participants were explicitly permitted to complete the survey, and which participants completed the survey because parents did not request otherwise, then investigate whether there are differences in item responses between these two groups.

Future Directions

An interesting discovery that came about in the process of this study is that there is an abundance of research on adolescent knowledge, beliefs, and attitudes on a variety of topics. However, it was remarkably difficult to find studies that asked whether there is a meaningful correlation between adolescent knowledge, beliefs, and attitudes, and adolescent behaviour. Moving forward, it may be relevant to ask how much adolescent knowledge, beliefs, and attitudes matter in the context of the decisions they make. Does knowledge influence decision making more, or less, than beliefs or attitudes do? To what extent do these constructs influence behaviour, or predict behaviour?

Another interesting finding is that there are no differences between reports from junior and senior high students sampled on why they think adolescents choose to have sex. One may predict that, given factors such as differences in curricular content between junior high and senior high students, the influence of adolescent peers, and other microsystem influences, that there would be differences in their perspectives in this area. As such, future research may benefit from a qualitative inquiry into adolescent perspectives on why adolescents choose to have sex in order to understand their perspective, and perhaps understand why there appear to be no differences by school/education level.

As far as the content of the actual survey is concerned, there is opportunity to revise the items that were double-barrelled. As well, this survey—although intended to address high-risk behaviours associated with alcohol, marijuana, and sex—is primarily focused on alcohol and sex, which seems to be a pattern amongst surveys aimed at youth high-risk behaviour; marijuana use in relation to adolescent behaviour still appears to be in its infancy in research of ‘mainstream’ adolescents. Therefore, to gain further insight into all three areas the survey would benefit from

the addition of several items that inquire into adolescent knowledge, beliefs, and attitudes specifically about marijuana use.

Researchers who have explored high-risk youth behaviour have diverse recommendations for addressing these behaviours. For example, Fergusson and Lynksey (1996) state, based on their findings, that:

> Although it may be valuable to target interventions at specific outcomes, such as alcohol misuse or teenage sexual risk taking, it is also important that these interventions recognize that these behaviors [*sic*] occur within a social and developmental context in which the risk factors that encourage one adjustment problem overlap with the risk factors that encourage others (p. 95).

Based on what Fergusson and Lynksey (1996) explain, consideration for prevention programs should take a multi-topic approach that combines sexual health education and substance use education, instead of teaching these topics as separate entities. Do adolescents actually know about the relationship between substance use and increased high-risk sexual activity, and other high-risk behaviours? Would knowing this information have a positive impact on their choices about substance use and sexual activity? In order to approach sexual health and substance use education in this manner, teachers would need to have a solid understanding about what researchers suggest as the connection between adolescent substance use and adolescent high-risk sexual activity.

Others make recommendations that address the role parenting style plays in adolescent engagement in high-risk behaviour. This may be especially relevant considering adolescents rated their parents as the best source of information regarding sexual activity. Biglan and collegues (1990) recommend, based on their findings on the relationship between high-risk

sexual behaviour among adolescents and coercive parenting theory, that parents or parent-like role models be available to adolescents. They add that this is an important recommendation because they found that not only was low parent availability associated with increased risky sexual behaviour, but also associated with increased substance use, less prosocial behaviour, academic difficulties, and belonging to a peer group that also engages in these activities (Biglan et al., 1990).

MacDonald and colleagues (2011) explain that, "youth require effective interventions that respond to their specific circumstances and unique needs" (p. 443). To account for this they recommend that adolescents be active participants in the development of curriculum content, as well is in piloting the curriculum resources they aided in the development of (MacDonald et al., 2011). Outcomes from this survey may be the first step in this direction. It can be said that the quality of communication is in the response that you get; perhaps the same can be said of education—that the quality of education is in the response that you get. Involving adolescents in the development of their own learning could lead to adolescents also taking ownership of implementing that learning into a real world context.

Based on outcomes from this survey, it is recommended that implementation of sexual health and substance abuse programs be reviewed on a much larger scale. Some of the variation in adolescent knowledge of the topics addressed in this study may stem from inconsistencies between programming regardless of the adherence to curricular objectives. In addition to this, program initiatives that involve educating parents and teachers in how to access the most up-to-date information, and how to disseminate this information to adolescents, is recommended. Finally, it is recommended that adolescents be given the opportunity to become more actively involved in their own sexual health and substance use education. It was apparent from the short

answer items on this survey that adolescents have a great deal of input to provide about their education. Giving them opportunities to become active participants in the process may lead to more of them becoming active participants in the intended education outcomes in these areas, such as reducing adolescent engagement in high-risk behaviour, and reducing the consequences of adolescent high-risk behaviour.

Although this survey does not provide concrete answers about how to best address the issue of effective education regarding sexual activity and substance use, what it does do is highlight discrepancies between adolescent high-risk behaviour and their education, their beliefs regarding prevention of engagement in high-risk behaviours, and prevention of the consequences associated with adolescent engagement in high-risk behaviour. Ultimately, knowledge is not power, knowledge is only potential power; it is what one does with knowledge that makes a difference. Therefore, the next step in prevention education and high-risk adolescent behaviour may lie somewhere in that space between what adolescents are learning, and how we help them integrate what they have learned into their own beliefs, which may, in turn, influence their behaviours and choices.

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Appendix A

School Administration Information Letter

Research Project Title: Youth Prevention Survey
Researcher: Dr. Jacqueline Pei, Associate Professor, Department of Educational Psychology, Assistant Clinical Professor, Department of Pediatrics University of Alberta
Research Assistants: Alethea Heudes, Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program, and Katrina Kully-Martens Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program

Dear School Administrator(s),

We are requesting your help in completing a study that involves Alberta junior high and high school teens participating in an anonymous online survey about youth beliefs, knowledge, and attitudes regarding sexual activity, drug, and alcohol use among their peers. Information from this study will be used to support development of programs to teach students about making healthy decisions about sexuality and preventing high-risk behaviours. The results will also be shared with policy makers, at professional development sessions, conferences, and in peer-reviewed journals. We will also be happy to share the results with you once the research has been finalized.

All research assistants involved in this project will comply with the University of Alberta Standards for the protection of Human Research Participants and will sign a confidentiality agreement. All reporting of the results of the research will be in "aggregate form" (e.g., average ratings, general trends, etc.). Also, this survey is ANONYMOUS – there will be no information anywhere on the survey that will identify any students as participants. All data will be stored on a password-protected computer and only accessed by the researchers or trained research assistants. The survey is being conducted through a program called 'Survey Monkey' and as such, data will be housed in the USA and therefore subject to US privacy laws such as the Patriot Act. This survey is designed to be consistent with much of the content covered by the Alberta Education Program of Studies in Health Education, and Career and Life Management.

Please confirm with your school WRaP coach whether or not you would like your school to participate in this research project. Shortly thereafter the school coaches will connect with your teachers to organize a convenient schedule to administer the surveys. The survey portion of this research will be completed by Spring 2014. Should you have any questions or require additional information please contact Dr. Jacqueline Pei at Jacqueline.pei@ualberta.ca or Alethea Heudes at aheudes@ualberta.ca

Thank you for your support!

Appendix B

Research Information Letter and Opt Out Option

Research Project Title: Youth Prevention Survey
Researcher: Dr. Jacqueline Pei, Associate Professor, Department of Educational Psychology, Assistant Clinical Professor, Department of Pediatrics University of Alberta
Research Assistants: Alethea Heudes, Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program, and Katrina Kully-Martens Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program

Introduction: This study involves your teen doing a short survey at school about youth beliefs, knowledge, and attitudes regarding sexual activity, drug, and alcohol use among their peers. Information from this study will be used to support development of programs to teach youth about making healthy decisions about sexuality and preventing high-risk behaviours. The results will also be shared with policy makers, at professional development sessions, conferences, and in peer-reviewed journals.

Method: The online survey will take about 30 minutes to complete. All research assistants involved in this project will comply with the University of Alberta Standards for the protection of Human Research Participants and will sign a confidentiality agreement.. All reporting of the results of the research will be in "aggregate form" (e.g., average ratings, general trends, etc.). Also, this survey is ANONYMOUS – there will be no information anywhere on the survey that will identify your teen as a participant. All data will be stored on a password-protected computer and only accessed by the researchers or trained research assistants. The survey is being conducted through a program called 'Survey Monkey' and as such, data will be housed in the USA and therefore subject to US privacy laws such as the Patriot Act. This survey is designed to be consistent with much of the content covered by the Alberta Education Program of Studies in Health Education, and Career and Life Management. It will be run during class time in partnership with the school success coach and classroom teacher. All participants will be asked for assent at the beginning of the survey and will have the option to stop participation at any time during the survey with no consequences for choosing to do so.

For additional information please contact Dr. Jacqueline Pei at Jacqueline.pei@ualberta.ca or Alethea Heudes at aheudes@ualberta.ca

Should you prefer that your teen **NOT** participate in this study at all then please return this form with your signature on the attached page:

I DO NOT consent to my teen participating in the above-mentioned Youth Prevention Survey.

_____ _____

Signature Date

Thank you for your support!

Appendix C

Research Information Letter and Permission Form

Research Project Title: Youth Prevention Survey
Researcher: Dr. Jacqueline Pei, Associate Professor, Department of Educational Psychology, Assistant Clinical Professor, Department of Pediatrics University of Alberta
Research Assistants: Alethea Heudes, Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program, and Katrina Kully-Martens Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program

Introduction: This study involves your teen doing a short survey at school about youth beliefs, knowledge, and attitudes regarding sexual activity, drug, and alcohol use among their peers. Information from this study will be used to support development of programs to teach youth about making healthy decisions about sexuality and preventing high-risk behaviours. The results will also be shared with policy makers, at professional development sessions, conferences, and in peer-reviewed journals.

Method: The online survey will take about 30 minutes to complete. All research assistants involved in this project will comply with the University of Alberta Standards for the protection of Human Research Participants and will sign a confidentiality agreement. All reporting of the results of the research will be in "aggregate form" (e.g., average ratings, general trends, etc.). Also, this survey is ANONYMOUS – there will be no information anywhere on the survey that will identify your teen as a participant. All data will be stored on a password-protected computer and only accessed by the researchers or trained research assistants. The survey is being conducted through a program called 'Survey Monkey' and as such, data will be housed in the USA and therefore subject to US privacy laws such as the Patriot Act. This survey is designed to be consistent with much of the content covered by the Alberta Education Program of Studies in Health Education, and Career and Life Management. It will be run during class time in partnership with the school success coach and classroom teacher. All participants will be asked for assent at the beginning of the survey and will have the option to anonymously stop participation at any time during the survey with no consequences for choosing to do so.

For additional information please contact Dr. Jacqueline Pei at Jacqueline.pei@ualberta.ca or Alethea Heudes at aheudes@ualberta.ca

If your child has your permission to participate in this study then please return this form with your signature on the attached page:

I consent to my teen participating in the above-mentioned Youth Prevention Survey.

_____ _____
Signature Date

Thank you for your support!

Appendix D

Youth Prevention Survey – Modified to Word Document Format

Project Title: Youth Prevention Survey
Researcher: Dr. Jacqueline Pei, Associate Professor, Department of Educational Psychology, Assistant Clinical Professor, Department of Pediatrics University of Alberta
Research Assistants: Alethea Heudes, Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program and Katrina Kully-Martens Graduate Student, Department of Educational Psychology, School and Clinical Child Psychology Program

Why are you being asked to be part of this research study?
You are being asked to take part in this survey because we are trying to learn more about beliefs, knowledge, and attitudes about sexual activity, drug, and alcohol use among your peers. We are asking you to be in the study because you know much more than us adults do about what's actually going on in the lives of teens today. About 600 teens will be in this study.

Who do I contact if I have questions?
For questions regarding the study contact Dr. Jacqueline Pei at Jacqueline.pei@ualberta.ca or Alethea Heudes at aheudes@ualberta.ca
For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

If you join the study what will happen to you?
Nothing. This study is completely anonymous; nobody will know your answers except you.

Will any part of the study be painful?
Some of the questions might make you feel a little uncomfortable for a few minutes because some of the topics are a bit personal.

Will the study help you?
You may discover you want to learn more about making healthy choices and avoiding decisions that could put you in danger or lead to an unplanned pregnancy.

Will the study help others?
Yes! We will use the data from this study to help us create better programs to help you and your peers make the right choices.

Do your parents know about this study?
A letter was sent home to your parents/guardians.

Who will see the information collected about you?
There will be no information collected about you personally so nobody will ever know what questions you answered or that you took the study.
The information collected during this study will be kept safely locked up.

The study information is kept completely confidential. No one will ever know which answers are yours except you.
This study is also kept confidential under the Patriot Act. This means that people other than those on the research team could view your anonymous responses but they will never know who gave the responses.

Do you have to be in the study?
No, you do not have to be in the study. No one will be upset if you don't want to do this study. It's up to you.

What if you have any questions?
You can ask any questions that you may have about the survey before, during, or after.

What other choices do you have if you say no to this study or change your mind about participating?
You will remain in the classroom and go onto one of the games or websites we have for you. That way the only person who knows you chose not to do the survey is you.
You can also change your mind and stop being part of it at any time if you first decided you do want to participate. All you have to do is click exit.
Once you do click submit at the end of the survey you will no longer be able to withdraw because it is anonymous so we don't know which survey is yours.
If there are questions you just don't want to answer, you can just skip them!

Please choose below if you would like to go ahead and do the survey:

Yes, I will participate in this survey
No, I don't want to do this

Demographics
(2) What grade are you in?
(3) How old are you?
(4) What is your gender?

Strongly agree/Disagree:
(5) Alcohol affects your ability to make safe decisions. 123456789
(6) Marijuana affects your ability to make safe decisions. 123456789
(7) You can still be in control of yourself if you are high. 123456789
(8) You can still be in control of yourself if you are drunk. 123456789
(9) You can get pregnant when you have sex while drunk. 123456789
(10) You can get pregnant the first time you have sex. 123456789
(11) You can get pregnant if a boy does not ejaculate while having sex. 123456789
(12) A girl can get pregnant if she has sex during her period. 123456789
(13) Drinking alcohol can hurt a baby anytime during pregnancy. 123456789
(14) It's ok to drink a little bit while pregnant. 123456789
(15) Getting drunk is the same thing as binge drinking. 123456789

(16) Binge drinking is the only type of drinking that can hurt a baby during pregnancy. 123456789
(17) It's safer to drink beer/wine than it is to drink vodka/liquor when you're pregnant. 123456789 (item deleted during data analysis)
(18) It's safer to drink beer/wine than it is to drink vodka/liquor while pregnant. 123456789 (item deleted during data analysis)

(19) Which is an example of binge drinking?
- a man having 5 or more drinks in a row
- woman having 4 or more drinks in a row
- getting drunk
- all of the above

(20) Which has most alcohol?
- glass of wine
- can of beer
- shot of rum/vodka/tequila
- all have same amount

(21) How much alcohol during pregnancy is safe?
- No amount is safe
- 1-2 drinks per week
- 3-4 drinks per week

(22) What kind of birth defects might be caused by drinking alcohol during pregnancy?
- heart defects
- cerebral palsy
- miscarriage
- death
- brain damage
- ADHD
- memory problems
- learning disabilities
- none

(23) I know someone who drank alcohol while they were pregnant.
True
False
(24) Teens need parent consent to take birth control?
True
False

(25) How much do you think you know about birth control?
- A lot
- A little bit
- nothing

(26) How much do you think you know about how to get Birth control?

- A lot
- A little bit
- nothing

(27) How much do you think you know about how to get condoms?

- A lot
- A little bit
- nothing

Always/Never:

(28) Do you think that your friends who are having sex are practicing safe sex? 123456789
(29) Do you think that abstinence (not having sex at all) is realistic? 123456789
(30) It would be easier to make safer decisions about drugs/sex/alcohol if could have open and honest conversations with parents. 123456789
(31) It be easier to make safer decisions about drugs/sex/alcohol if could have open and honest conversations with teachers. 123456789
(32) It be easier to make safer decisions about drugs/sex/alcohol if could have open and honest conversations with some type of mentor. 123456789
(33) Teens want to talk about sex with an important adult(s) in their life but don't know what to say or how to say it. 123456789
(34) Having sex is not a big deal. 123456789
(35) It's okay to use alcohol to get someone to have sex with you. 123456789
(36) Drinking while pregnant is not a big deal. 123456789
(37) It's ok to have sex without using protection if it's with someone you are in a relationship with, or someone you know really well. 123456789
(38) Guys are responsible for carrying condoms if they plan on having sex. 123456789
(39) Girls are responsible for carrying condoms if they plan in having sex. 123456789
(40) Girls are responsible for being on the pill if they plan on having sex. 123456789

Strongly Agree/Strongly Disagree

(41) I have all of the information I need to avoid an unplanned pregnancy. 123456789
(30) I have all of the information I need to drink responsibly. 123456789
(31) I have all of the information I need to make safe decisions about drugs. 123456789

(39) Who do you think provides you with the best information when you are making decision about sexual activity?

- friends
- boyfriend/girlfriend
- parents
- teachers
- stuff you read on the internet
- older siblings
- cousins
- other (comment box)

Always/Never:

(45) I use alcohol to work up the courage to have sex/engage in sexual activities. 123456789
(46) I avoid situations where there will be drugs and/or alcohol. 123456789
(47) I tell my friends if I am worried they are practicing unsafe sex. 123456789

(48) I tell my friends if I am worried they are abusing drugs or alcohol. 123456789
(49) I worry about the consequences if I have unprotected sex. 123456789
Strongly Agree/Strongly Disagree
(50) It is considered more normal as a teenager today to engage in sexual activity than to not engage in sexual activity. 123456789
(51) It is considered more normal as a teenager today to drink alcohol than to not drink alcohol. 123456789

(52) What is the number one reason you think youth have sex:

- For love
- Curiosity
- Influence of drugs/alcohol
- Loneliness
- To get into a relationship
- To lose their virginity
- Pressure from their partner
- Other (comment box)

(53) What do you think are the most important issues about sex, pregnancy, drugs, and alcohol for adolescents today?

(54) How would you feel most comfortable learning about your sexual health and preventing pregnancy?

(55) What do you think students your age need to learn more about regarding sexual health and drug/alcohol abuse?

(56) Who do you think should teach you about these things?

(57) What do you think students your age need to learn less about regarding sexual health and drug/alcohol abuse?

(58) What is the biggest change you think needs to be made to help youth make safe and healthy choices about sex?

(59) What is the biggest change you think needs to be made to help youth make safe and healthy choices about drug and alcohol?