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**Factors impacting on the relationship between alcohol use and risky sexual behaviour
among young people: a systematic review**

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ABSTRACT

Within the literature, there is a well-established relationship between alcohol use and risky sexual behaviour. Three different but related explanations have been identified to account for the relationship, namely: social, biological and individual. Although these explanations and the associated factors have been well explored in the literature there is currently no empirical initiative that has shown how these factors interact with each other within the alcohol use and risky sexual behaviour relationship. The aim of the systematic review is to review and synthesise existing literature on the relationship between alcohol use and risky sexual behaviour among young adults (18 – 24 years old). Seventy-one articles were included in the review subsequent to a systematic search of the literature. The review highlighted three thematic domains relating to personality traits, social determinants and interpersonal factors, contributing to a more comprehensive understanding of these factors. At a foundation level, more research is required to gain new insights, discover new ideas and/or increase knowledge of a phenomenon, i.e. factors impacting the relationship between alcohol use and risky sexual behaviour among young adults.

Keywords: Alcohol use, Risky sexual behaviour, Adolescence, Young adults, Risk and protective factors, Contributing factors and influences, Systematic Review.

INTRODUCTION

There is a substantial body of evidence documenting the relationship between alcohol use and risky sexual behaviour (see Adams et al., 2014; Campbell, Williams & Gilgen, 2002; Fritz et al., 2002; Mbulaiteye et al., 2000; Weiser et al., 2006). While the literature indicates a relationship between alcohol use and risky sexual behaviour there is little empirical evidence highlighting the nature and complexity of this relationship, especially as it relates to intensity and frequency of alcohol use and contextual variables such as socio-economic status as well as gender and age (Cooper & Orcutt, 2000; Leigh & Stall, 1993). Similarly, the links between motivations for alcohol use and sexual behaviours are not well understood (Patrick & Maggs, 2010). It is noteworthy that high risk sexual behaviours and the resulting health effects disproportionately affect young people.

Evidence from a 2010 National Survey on Drug Use and Health conducted among young people, predominantly urban youth located in New York City, indicated that alcohol use was highest among young adults from 21-25 years of age with 45.5% of these individuals reporting binge drinking, and 18% reporting heavy drinking (binge drinking on 5 or more days) in the past month (Griffin, Scheler, Acevedo, Grenard & Botvin, 2012). Furthermore, in a study conducted in the US, approximately 50% of all new sexually transmitted infections (STIs) in the US occurred among 15 to 24-year olds, and almost 50% of all new HIV infections in the US occurred in young people aged 24 years or under (CDC, 2003, Griffin et al., 2012). Brown and Venable (2007) also found that alcohol use prior to a sexual encounter was strongly correlated to unprotected sexual intercourse encounters involving casual partners. Important to note previous research has focused on adolescents or youth in formal educational settings (Pithey & Morojele, 2002), in other words those attending school, college and/or university. Additionally, it is important at this point to note the definition of both adolescents and young adults.

According to the APA (2002) the most commonly used chronologic definition of adolescence includes ages 10 – 18, nevertheless it could include 9 – 26 years depending on the source. “The current lack of consensus of an operational definition of adolescent chronology can be attributed to a number of factors, including: the appreciated continuity of human development; a recognition of individual, cultural, gender and racial variability; the ascribed relative salience of specific developmental milestones, and a perpetually refined science of

human development in a dynamically evolving society” (Curtis, 2015 p.9). Curtis (2015) proposes an operational definition of adolescence based in developmental science that includes ages from 11 to 25 years. In this definition, “early adolescence” and “young adulthood” are sub-stages of this critical transitional period. With early adolescence ranging from 11 years -13 years, adolescence from 14 – 17 years, and young adulthood from 18 – 24 years old. For the purpose of this study, Curtis’ (2015) operational definition will be taken into account when referring to young adults.

The relationship between alcohol use and risky sexual behaviour is complex and cannot be explained by a single mechanism. This relationship instead reflects multiple underlying causal and non-causal processes (Cooper, 2006). While there is a clear relationship between alcohol use and risky sexual behaviour, research identifies them as two separate variables interacting at a specific given point. The use of alcohol has globally been identified as the third leading risk factor for poor health (World Health Organisation, WHO, 2010). The deleterious effects of alcohol result in an estimated 2.5 million deaths every year, of which a significant proportion occur amongst young people (WHO, 2010). Previous research has shown that a range of alcohol-related problems, including poor class attendance, hangovers, trouble with authority, injuries, and even fatalities are commonly experienced by young adults engaging in heavy drinking (see Hingson, 2010; Hingson, Heeren, Winter, & Wechsler, 2005; Foster, Neighbours & Young, 2013). Despite these findings, heavy alcohol consumption (AC) among young adults remains normative and is increasing in prevalence within university populations (Stewart & Devine, 2000). Stewart and Devine further state that studies have shown that about one-third of undergraduate students drink at a level that produces acute physical, psychological, social, and academic problems (e.g. hangovers, lowered self-esteem, sexual misconduct, missing classes). Crawford and Novak (2007) reported that students who perceive heavy drinking as a common activity at school are more likely to increase their levels of AC in order to gain social acceptance and avoid negative peer evaluations. Despite having specific policies designed to reduce students’ levels of consumption, binge drinking remains a frequent recurrence and is escalating (Crawford & Novak, 2007).

Previous research (see Baer, 1994; Critchlow, 1987; Darkes & Goldman, 1993; Evans & Dunn, 1995; Stacy, Widaman & Marlatt, 1990) has identified a number of specific factors associated with heavy drinking, including demographic characteristics (gender and

fraternity/sorority membership); descriptive and injunctive social norms; enhancement, social, coping, and conformity drinking motives, expectancies and tendencies; and subjective evaluations of positive and negative alcohol effects. Surprisingly little research has evaluated the relative contribution of different factors in predicting AC and related problems as well as the direct impact of these constructs on binge-drinking consequences in a systematic manner (Neighbors, Lee, Lewis, Fossos & Larimer, 2007; Turrisi, Wiersma & Hughes, 2000).

Hall, Holmqvist, Simon and Sherry (2004) define risky sexual behaviour in terms of the behaviour itself, as well as the nature of the relationship between partners. Simply put, it can take several forms, ranging from acquiring a large number of sexual partners, to engaging in risky sexual activities and sexual intercourse under the influence of substances such as cocaine or alcohol (Hall, Holmqvist, Simon & Sherry, 2004). Risky sexual behaviour is identified as the second highest risk factor for harm in high mortality developing countries and constitutes 10.2% of the global burden of disease (Rehm & Room, 2003, as cited in Morojele et al., 2006). Globally there are an estimated 357 million new cases of sexually transmitted infections (STIs) each year (WHO, 2016), with the highest rates among 20-24 year olds (Karl & Gabriele, 2005). Young adults are vulnerable for a number of reasons: their tendency to have multiple sexual partners (concurrent or sequential) as well as difficulty accessing effective STD prevention services (Charnigo et al., 2013); unprotected sexual intercourse (Gulle et al., 2006; Khasakhala & Mturi, 2008); social, economic and contextual settings (Khasakhala & Mturi, 2008); sexual debut for most people occurs during their teenage years (Khasakhala & Mturi, 2008); the urge to have sex and curiosity play a role in risky behaviour but to name a few (Caron, Davis, Wynn, & Roberts, 1992; Keeling, 1995; Mickler, 1993; Okafor & Obi, 2005; Sells & Blum, 1996). Simultaneously, there has been a marked increase in the unwanted personal and social consequences associated with these behaviours such as: higher prevalence of STDs, unintended pregnancies, school dropouts, and heightened demands on the health and human service agencies (Langer, Warheit & McDonald, 2001)

As reported by Langer et al. (2001), these negative social and personal consequences associated with these changes in sexual attitudes and behaviours have attracted the interest of researchers and scholars from a variety of disciplines. Researchers collectively have examined the impact of biological and psychological predispositions as well as elements derived from our social and cultural environments (Langer et al., 2001). These include

psychosocial variables (e.g., norms, attitudes, and self-efficacy) as well as personality traits such as sensation seeking and impulsivity (Charnigo et al., 2013; Hoyle, Fejfar & Miller, 2000; Noar, Zimmerman, Palmgreen, Lustria, & Horosewski, 2006).

As Cooper (2002) noted, “the relationship between Alcohol use and risky sexual behaviour appears to be both complex and highly circumscribed” (p. 115), varying with characteristics of the individual drinker and the sexual situation. Although some multiple-event studies have supported the hypothesis that AC increases the likelihood of engaging in risky sexual behaviour, the findings are mixed (Cooper, Peirce, & Huselid, 1994; Graves & Hines, 1997; Morrison et al., 2003; Testa & Collins, 1997). Some authors point to an interplay between individual and environmental factors reflecting a cyclical and mutual dynamic of the individual influencing or being influenced by their environment (Choquet, 2004; Clapp, Segars & Voas, 2002, 2008; DeJong et al., 2006; Harford, 1979; Jessor, 1998; Wechsler et al., 2002). Other authors have found stronger results when the outcome measure was number of casual sexual partners than when it was frequency of condom use (Cooper, 2002). Graves and Hines (1997) found that AC was more common in sexual events that involved partners known for a short period of time; however, results regarding the relationship between AC and condom use were inconsistent. The interrelationships between partner type, intoxication, and condom use make it difficult to disentangle alcohol’s role in unprotected sex (Abby, Parkhill, Buck & Saenz, 2007). Although alcohol researchers focus on alcohol’s role in risky sexual behaviour, many theories of health behaviour have been applied to sexual risk taking and STD and HIV prevention (Albarracin et al., 2005).

Prior literature focused on adolescents, while less is known about how associations between substance use and risky sexual behaviour may change across young adulthood. The transition to adulthood is marked by dramatic increases in freedoms and responsibilities that occur at the same time that an individual’s ability to self-regulate is still emerging (King, Nguyen, Kosterman, Bailey & Hawkins, 2012). However, how the associations between substance use disorders and risky sexual behaviours unfold across young adulthood remains unclear. (King et al., 2012). Despite the strong link between alcohol use and risky sexual behaviour, researchers have not adequately explored this relationship among young adults. The studies that have been conducted focused primarily on adolescents in formal educational settings (Cooper, 2002; Flisher et al., 1996a, 1997b, as cited in Pithey & Morojele, 2002), clinic-based populations receiving treatment for STIs and HIV (Kalichman, Simbayi Cain & Jooste,

2007). It is important to note that, the majority of studies that have linked alcohol use and risky sexual behaviour have been carried out in the developed world and among high school or college students (Khasakhala & Mturi, 2008). In a study conducted by Griffin et al. (2012), they found, these behaviours peak during the early to mid-twenties, as young people live more independently and autonomously from their family of origin, enjoy new freedoms such as legal drinking and the ability to enter bars and nightclubs, and have increased opportunities for sexual and romantic relationships. With statistics suggesting that the age group of 18–25 years is most vulnerable in terms of abusing alcohol (SACENDU, 2010), it is imperative to explore the link between alcohol use and risky sexual behaviour in this cohort. This would contribute to a more comprehensive understanding of the relationship between Alcohol use and risky sexual behaviour as suggested by Adams et al. (2014).

Rationale

Within the literature, there is a well-established relationship between alcohol use and risky sexual behaviour (Adams et al., 2014; Campbell et al., 2002; Fritz et al., 2002; Mbulaiteye et al., 2000; Weiser et al., 2006). This relationship has emerged as a major health concern especially among young adults between the ages of 18-25 (Morojele et al., 2004; SACENDU, 2010). Freeman and Parry (2006) have identified three different but related explanations to account for the relationship, namely: social, biological and individual. Although these explanations and the associated factors have been well explored in the literature there is currently no empirical initiative that has shown how these factors holistically interact with each other within the alcohol use and risky sexual behaviour relationship. The current study hopes to contribute in this regard, by systematically reviewing the literature with the ultimate aim of informing future studies. It is anticipated that this would contribute to a more comprehensive understanding of the factors influencing the relationship between alcohol use and risky sexual behaviour among young adults, and better inform intervention strategies.

Aim

The aim of the systematic review is to review and synthesise existing literature on the factors that impact on the relationship between alcohol use and risky sexual behaviour among young adults (18 – 24 years old).

METHOD

We performed a systematic review of published studies since 2000 to identify factors impacting on the relationship between alcohol use and risky sexual behaviour among young

people (age 18-24 years). The findings of this review will provide evidence-based knowledge critical for addressing the aim and specific objectives.

Review question

- What factors impact the relationship between alcohol use and risky sexual behaviour among young adults?

Article Search

Various resources, published in English from the year 2000 to present, were consulted for the review. Based on the nature of the topic, ScienceDirect and Ebscohost were the main sources for the search. Databases within EbscoHost included PsychARTICLES, SocINDEX, and Academic Search Complete. Once the articles had been appraised, manual searching of reference lists then took place. An initial review of relevant literature was conducted to identify key studies in the field. The following keywords formed part of the initial search within the above-mentioned databases: Prevalence, alcohol consumption, risky sexual behaviour, alcohol use and risky sexual behaviour, participants, risk and protective factors, extraneous factors, at-risk behaviour, and risk-taking behaviour.. Within the searches that were initially conducted it was found that the initial keywords did not yield the expected number of studies pertaining to the topic or no results were yielded. It was therefore, decided to use the following terms: alcohol consumption, risky sexual behaviour, young people, young adults, risk and protective factors, contributing factors and influences.

Inclusion/Exclusion Criteria. Included studies were original English-language research articles published in peer-reviewed literature which reported on both quantitative and qualitative studies that focused on the factors impacting on the relationship between alcohol use and risky sexual behaviour among young people. The review did not attempt to categorise studies in terms of these two methods of research, but instead to provide a comprehensive picture of studies exploring the factors contributing to alcohol use and risky sexual behaviour. The review included both males and females between the ages of 18-24 years. Any racial, ethnic, cultural, or religious groups were eligible for inclusion, regardless of geographic region. Articles pertaining to sexual violence, sexual coercion, intimate partner violence, HIV/AIDS and alcohol use disorders were not included in the review, as there has been a paucity of research conducted to adequately address the extraneous factors contributing to the relationship between alcohol use and risky sexual behaviour (Morojele et

al., 2006; Scott-Sheldon et al., 2012). Furthermore, studies focusing on age groups other than young adults, and studies focusing on substance use in general were also excluded from the review.

Quality Assessment. Study quality assessment is relevant to every step of a review. The assessment is crucial in evaluating the strengths, weaknesses and benefits of the assumptions and conclusions made in the study, as well as exploring heterogeneity and informing decisions regarding suitability of meta-analysis. In addition, they help assess the strength of inferences and make recommendations for future research. The selection of studies to be included in the review was thus assessed by utilising an adapted version of the *Evaluation Tool for Qualitative Studies* and *The Evaluation Tool for Quantitative Research Studies* (Long, Godfrey, Randall, Brettle & Grant, 2002; Long & Godfrey, 2004, Attached hereto as Appendix V).

Data extraction. Using the template in Table 1 (Appendix) data was extracted at various stages namely: Assessment of eligibility, assessment of quality, assessment of study characteristics and extraction of study findings. The table utilised for data extraction has been formatted to extract data specifically relevant to the research question, which includes the study authors, aim, sample size, participant characteristics, research design, outcomes, themes, and self-concept domain.

Data synthesis. Data was summarized by means of tabulation of study characteristics, quality and effects as well as statistically if they are sufficiently similar and if they are of adequate quality to explore differences between studies and combining their effects (meta-analysis). The *Textual Narrative Analysis* approach as proposed by Lucas, Arai, Baird, Law and Roberts (2007) was utilised. This method synthesises the studies used for review by: study characteristics, context, quality and findings are reported on. Structured summaries were then developed, expanding on and illuminating the context of the extracted data. This method was utilised as this approach typically groups studies more homogenous groups, synthesising different types of research evidence, and making explicit the diversity in study designs and contexts (Lucas et al., 2007).

RESULTS

The aim of the systematic review is to review and synthesise existing literature on the factors that impact on the relationship between alcohol use and risky sexual behaviour among young adults (18 – 24 years old). The results of the systematic review are structured as follows: type of research, scope and focus of research, context of the studies, quality (content and method of the studies), age cohort, theory, and findings; as proposed by Lucas et al. (2007) in the Textual Narrative Analysis. A detailed summary of the final search procedure will be outlined below followed by a comprehensive explanation of the findings.

Article search procedure

The keyword search yielded a total of 4149 articles with 196 titles identified as relevant and were included for the abstract appraisal. The 147 articles that were excluded did not meet the inclusion criteria as it focused on other substances, HIV/AIDS related cases, intimate partner violence, and other age groups. Of the 196 abstracts, 29 were included for full text appraisal. After a full-text appraisal only 23 articles were included in the review. Based on reference list mining of the included article an additional 28 articles were identified as relevant for full-text appraisal. This process is outlined in the figure 1.

[INSERT FIGURE 1 HERE]

1. Type of Research

The 51 articles included in the review can broadly be categorised into two types that is empirical work and review articles on alcohol use and risky sexual behaviour. Forty-five articles were classified as empirical articles utilising both qualitative and quantitative methods, as well as longitudinal studies with various age cohorts of young people ranging from children in school, adolescents in high school, college and university students, employed and unemployed youth, drinkers and non-drinkers. Additionally, 6 of the articles were review articles, consisting of literature reviews and systematic reviews focusing on various aspects of the relationship between alcohol use and risky sexual behaviour, such as the nature of the relationship, the motivations for engaging, and risk and protective factors.

[INSERT TABLE 1 HERE]

2. Scope and focus of research

The research focus of the 45 studies in the review can generally be divided into four thematic domains namely:

1. Personality influences on alcohol use and risky sexual behaviour;
2. Social determinants of alcohol use and risky sexual behaviour;
3. Interpersonal factors related to alcohol use and risky sexual behaviour (See Table below).

These domains will be discussed in greater detail below.

[INSERT TABLE 2 HERE]

Thematic Domains

1. Personality influences on alcohol use and risky sexual behaviour

Studies in this domain focused on how personality traits influence their motivation to engage in risky alcohol use, risky sexual behaviour and/or the combination of the two. More specifically the articles focused on concepts like, self-efficacy, self-regulation, impulsivity, self-esteem, self-awareness, self-consciousness, sensation seeking but to name a few. This domain included fourteen studies. Using Textual Narrative Analysis as a guide, it is discussed specifically in terms of (1) content, (2) age cohort, (3) context, (4) method, and (5) theory.

Content

The content and specific focus of the research studies in this domain ranged from elucidating the joint contribution of sensation seeking and impulsivity to decision making to risk behaviours (Charnigo et al., 2013), evaluating self-consciousness, self-awareness, drinking identity, sensation seeking, self-esteem, as a moderator or contributor to risky alcohol use and subsequent risky sexual behaviour (Gullete et al., 2006; Miller et al., 2003). Studies (Quinn & Fromme, 2010) also focused on self-regulation as buffering risk associated with alcohol use and as a protective factor to heavy drinking and unprotected sex. Other studies focused specifically on gender differences (Morojele et al., 2006), individual competencies (Stuewig et al., 2015), distinct facets of impulsivity and its contribution to alcohol use outcomes (Shin, Hong, & Jeon, 2012), examining restraint and temptation (Rinker et al., 2013), and drinking refusal self-efficacy (Oei & Morawska, 2004).

Age Cohort

The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 17 and 26-years. Two longitudinal studies focused on a specific cohort at two points in their lives, one focused on a mean age of 14.6 years and the

second point was at a mean age of 22.8 (Griffin et al., 2012), the second study's first point was at age 10 -12 years and the second point was at 18 -21 years (Stuewig et al., 2015).

Context

The context of the research studies which focused on alcohol use and risky sexual behaviour among young adults were conducted primarily in various states in the United States of America, specifically various states in the United States of America. Studies were predominantly conducted amongst university students in both the private and public sectors. Studies were also conducted in both low-income communities and middle-income communities.

Method

The majority of the studies utilized quantitative methods (n = 9 of 10) with most utilising self-reported questionnaires or computer or online based surveys. Three studies were longitudinal studies that each had two contact points with individuals that reported on how behaviours at point one could be possible predictors for behaviour at point two (Griffin et al., 2012; Stuewig et al., 2015; Quinn & Fromme, 2010). All studies (n = 9) were generally descriptive studies that utilised correlation analysis and one utilising structural equation model (Murry et al., 2013). The one review study focused on key constructs of alcohol expectancies (AEs) and drinking refusal self-efficacy (DRSE) to explain the acquisition and maintenance of binge drinking.

Theory

There were only 5 of the 10 studies which used a theoretical framework to guide their study. Four of the eight studies utilized the Five-Factor Model of Personality (Charnigo et al., 2013; Miller et al., 2003; Shin et al., 2012; Stewart & Devine, 2000) to synthesise and interpret the findings of their study. Other studies utilized, Transtheoretcal Model of Behavioral Change (Gullete et al., 2006), and Alcohol Expectancy Theory (Oei & Morawska, 2004). One study utilised the theory behind Self-regulation and sensation seeking to synthesise and explain the findings (Quinn & Fromme, 2010).

[INSERT TABLE 3 HERE]

2. Social determinants of alcohol use and risky sexual behaviour

The studies in this domain explored the social, contextual and environmental factors impacting on the relationship between alcohol use and risky sexual behaviour. More

specifically the articles focusing on social aspects including social norms, motives assumptions and beliefs in the social context. Contextual aspects focused on the context in which alcohol use and risky sexual behaviour takes place. Lastly environmental aspects focus on the historical construction of communities.

Content

The content and specific focus of the research studies in this domain consisted of an array of focal areas including: assumptions of environmental approaches to alcohol use (Clapp et al., 2002), normative perceptions (Lewis, Patrick, Mittmann & Kaysen, 2014), social norms, demographics, drinking motives, and alcohol expectancies in predicting AC and related problems (Neighbors, Lee, Lewis, Fossos & Larimer, 2007), the nature of the relation among drinking beliefs, drinking tendencies, perceived sexual control (Walsh et al., 2013), behavioural consequences (Turisi et al., 2000), and effects of alcohol use on condom use (Abbey, Saenz, & Buck, 2005). Further studies explore alcohol use and risky sexual behaviour (Abby et al., 2007; Orchowski et al., 2012; Seth, Wingood, DiClemente & Robinson, 2011). Contextual aspects include the extent to which Spring Break drinking and sexual behaviours are related (Patrick, 2013), rates of risky sexual behaviour among women bar drinkers (Parks, Hsieh, Collins, Levonyan-Radloff & King, 2008), and reducing sexual risk behaviours among university students in particular (Connor, Psutka, Cousins, Gray & Kypri, 2013). Further studies focus on identifying patterns of alcohol use behaviours and alcohol expectancies among women (Stappenbek et al., 2001), the relationship between binge drinking, “reflection impulsivity” alcohol-related expectancies, and unplanned sexual behaviour in a sample of young social drinkers (Townsend et al., 2011). Environmental aspects include studies focusing on the extent of the current alcohol problem as well as a historical perspective (Vicary & Karshin, 2002), how alcohol misuse increases the occurrence of sexual risk behaviour in South African communities (Pithey & Morojele, 2002), and describing an example of the use of latent variable modelling to create measures of complex phenotypes and environments that illustrate the utility of the general versus specific conceptualization (Bailey, Hill, Meacham, Young & Hawkins, 2011).

Age Cohort

The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 17 and 35-years. One longitudinal study focused on 5th

graders at its first point of contact and adults were later retained at 24 years old (Bailey et al., 2011).

Context

The context of the research studies focused young adults in relation to social, contextual and environmental aspects of alcohol use and risky sexual behaviour primarily in countries outside of South Africa, specifically various states in the United States of America. Studies were predominantly conducted in schools, colleges and universities in both the private and public sector. Studies were also conducted in both low-income communities and middle-income communities. Two studies were conducted in South Africa, one in an impoverished community on the Cape Flats (Abby et al., 2007), and a second in broader South African communities (Pithey & Morojele, 2002).

Method

It was found that most studies in this domain utilised quantitative methods (n = 16). Various designs and data analysis techniques were used in these studies. The research designs used included correlational designs, cross-sectional and longitudinal designs. Many of these quantitative studies used independent and correlational techniques such as multiple, hierarchical and logistic regression (Abbey et al., 2005; Abby et al., 2007; Bogg & Finn, 2009; Connor et al., 2013; Lewis et al., 2014; Neighbors et al., 2007; Orchowski et al., 2012; Parks et al., 2008; Turisi et al., 2000; Seth et al., 2011). Two of the studies made use of latent analysis (Stappenbek et al., 2001; Townsend et al., 2011), and one study made use of path modelling procedures (Walsh et al., 2013). Three of the articles in this domain were review articles (Pithey & Morojele, 2002; Vicary & Karshin, 2002).

Theory

There were only three studies which used a theoretical framework to guide their study. These studies all utilised different theories to guide their study. Theories considered problem behaviour theory (Murry et al., 2013) and Traumagenic dynamics theory (Walsh et al., 2013). Another study utilized a conceptual model, more specifically family and economic stress theories and problem behavior theory (Murry et al., 2013). Lastly, Oei & Jardim (2007), utilized the theory behind alcohol expectancies (AE) and Drink refusal self-efficacy to shape and guide their study.

[INSERT TABLE 4 HERE]

3. Interpersonal factors related to Alcohol use and risky sexual behaviour

The studies in this domain focused on the family, peers, risk and protective factors, and personal attributes. The articles that focused broadly on the family and in particular, parental and family influence and parental and family beliefs. Peer aspects focused on the relationship between young adults and their peers. These factors included perceived care of friends, role modelling, and perceived alcohol use and sexual behaviour of friends. Personal attributes refer to attitudes, race, gender, genetics and religiosity. Lastly, risk and protective factors also emerged in this domain. Using Textual Narrative Analysis as a guide, it is discussed specifically in terms of content, age cohort, context and method, and theory.

Content

The content and specific focus of the research studies in this domain broadly considered the relationship between alcohol use and risky sexual behaviour to more individual, family and peer aspects. More specifically, exploring the relationship between alcohol use and risky sexual behaviour as a phenomenon (Adams et al., 2014; Cooper, 2002; Cooper, 2006), associations across motivations for engaging in alcohol use and risky sexual behaviour (Patrick & Maggs, 2010), to Illuminating our understanding of sexual behaviour (Marston & King, 2006), risk and protective factors (Voisin, Hotton, Tan & DiClemete, 2013; Langer et al., 2001; Kogan et al., 2010), and protective behavioral strategies (LaBrie, Lac, Kenney & Mirza, 2011). Individual aspects such as gender and psychological risk and protective factors (Park et al., 2005), cognitive and affective attitudes, personal normative beliefs, social determinants, and expectations (Sonmez et al., 2006), and the impact of partner type (Brown & Venable, 2007). Family relationships, focused on parental mediation and critical thinking (Radanielina-Hita, 2015). Peer relationships, with specific reference social relationships (Townshend, Kambouropoulos, Griffin, Hunt & Milani, 2014), perceived awareness and caring, or know or care about student's behaviour (Wetherill, Neal, & Fromme, 2010).

Age Cohort

The review of literature showed that studies in this research area focused predominantly on young adults between the ages of 15 and 35-years. One Mixed method study focused on 18-62-year olds (Townshend et al, 2014).

Context

The context of the research studies focused on young adults in relation to family, peers, and individual aspects relating to alcohol use and risky sexual behaviour primarily in countries outside of South Africa. Studies were predominantly conducted in colleges and universities in both the private and public sector. Studies were also conducted in both low-income communities and middle-income communities. Two studies were conducted in South Africa, one in an impoverished community on the Cape Flats (Adams et al., 2014), and a second One of the poorest suburbs in South Africa, average household income is less than R1500 pm, and unemployment is high (Townshend et al., 2014). Four reviews were conducted within this domain focusing on published articles worldwide (Cooper, 2002; Cooper, 2006; Marston & King, 2006).

Method

It was found that most studies in this domain utilised quantitative methods (n = 15). Various designs and data analysis techniques were used in these studies. The designs ranged from correlation designs, to survey designs, and cross-sectional and longitudinal designs. Data analysis techniques used ranged from structural-equation modelling (Radanielina-Hita, 2015; Schraufnagel et al., 2010; Wayment & Aronson, 2002) and generalized estimating equations (Voisin et al., 2013; Wetherill et al., 2010), to various types of regression (Brown & Venable, 2007; Kogan et al., 2010; Langer et al., 2001; Sonmez et al., 2006;). Two studies used structural correlational analysis (Adams et al., 2014; Park et al., 2005), while one study utilized latent profile analysis (Patrick & Maggs), and another utilized path analysis (Walsh et al., 2014). It was noted that only one study was a mixed method study that utilized regression analysis for data analysis (Townshend et al., 2014). Four reviews were conducted, three being literature reviews (Cooper, 2002; Cooper, 2006), and one a systematic review (Marston & King, 2006).

Theory

Ten of the 21 studies used a theoretical framework to guide their study. Theories comprised of Ecological Systems Theory (Kogan et al., 2010; Voisin et al., 2013) and Myotopia Theory (Brown & Venable, 2007; Cooper, 2002). Other theories included Message Interpretation Model (Radanielina-Hita, 2015), Health belief model (Wayment & Aronson, 2002), and The Theory of Interpersonal Behavior (TIB) (Sonmez et al., 2006).

[INSERT TABLE 5 HERE]

DISCUSSION

While the relationship between alcohol use and risky sexual behaviour is well-established in the literature (see Adams et al., 2014; Campbell et al., 2002; Fritz et al., 2002; Mbulaiteye et al., 2000; Weiser et al., 2006), there are few empirical studies that demonstrate and unpack the nature of this relationship (see Cook & Clark, 2005; Morojele et al., 2006; Muchimba et al., 2013; Scott-Sheldon et al., 2012). Research shows that young adults engage in heavy drinking, and experience a range of alcohol-related problems, including poor class attendance, hangovers, and trouble with authorities, injuries, and even fatalities (Foster et al., 2013; Hingson, 2010; Hingson, Heeren, Winter, & Wechsler, 2005; Wechsler, Davenport, Dowdall, & Moeykens, 1994; Wechsler, Lee, Kuo, & Lee, 2000). The aim of the systematic review is to review and synthesise previous literature to discuss factors identified in the literature that impact on the relationship between alcohol use and risky sexual behaviour. Thus, the articles in the current systematic review focused on literature highlighting these factors. The key factors impacting the relationship between alcohol use and risky sexual behaviour that emerged from the review were personality traits, social determinants, and interpersonal factors. Yet, determining alcohol's precise role in sexual risk taking has proven to be difficult. Past research has produced mixed results, depending on characteristics of individuals, their partners, and the situation, as well as how the link between alcohol use and sexual behaviour was assessed (Abby et al., 2007).

Patrick & Maggs (2010) suggested that the links between motivations for alcohol use and sexual behaviours are not well understood. However, within the literature the contributing factors for each overlap significantly, strengthening the relationship between the two concepts. While personality influences such as self-efficacy, self-regulation, self-awareness, sensation-seeking and so forth, are important to understanding and determining drinking patterns, it has been suggested that dosage is an important aspect of alcohol use which is largely under the individuals' control. However, there is evidence that frequency of drinking occasions may be greatly influenced by social factors (Vogel-Sprott, 1974). For example, university or college students with high levels of sensation seeking may be at especially high risk to begin or escalate heavy drinking. However, articles reviewed to a large extent employed a cross-sectional research design, thus making it impossible to examine changes over time and therefore, difficult to draw solid conclusions. The major implication for the studies that utilised longitudinal designs is the age periods at which data was collected.

Collecting data before adolescence and then after does not make allowance for the period in between. Future longitudinal examination of the etiology of alcohol use will allow for better understanding of the window of influence for specific risk and protective factors (Rutledge & Sher, 2001), and using multi-level modelling approaches would allow researchers to evaluate several predictors at once in order to determine their individual and combined effects (Kraemer et al., 2001).

Studies exploring the social, contextual and environmental factors conducted research on very similar populations, namely: college students or university students predominantly from first world countries (USA, New Zealand and Australia). While only four out of 20 studies under this theme focused on developing countries (South Africa and Kenya). Therefore, the above results may be limited to the specific context of North American, New Zealand and Australian young adults' patterns of risky behaviour. Literature reviewed found that social norms, social context, and social beliefs, as well as the broader environment contribute to alcohol use and risky sexual behaviour. Thus, studies from other countries are needed in order to acquire knowledge on the significance of the cultural influences of drinking motives.

Literature reviewed focusing on factors relating interpersonal aspects concentrated on how the individual interacts with various other parts of their lives such as the personal attributes (age, race, gender, biological make up, and religiosity), family, peers, romantic relationships, and broader risk and protective factors. The studies additionally highlight the impact of one's socio-political and historical situation shape decisions or lifestyles today (Cooper, 2006). Cooper (2006) further states that the belief that alcohol causally disinhibits sexual behaviour is firmly ingrained in our culture. Most people believe that drinking increases the likelihood of sexual activity, enhances sexual experience, and promotes riskier sexual behaviour (Cooper, 2006). Countries with an oppressive history have been shown to have a negative impact on an individual's healthy self-development, and more broadly on the development of the environment in which the individual resides. This is evident in studies conducted in South Africa (Adams et al., 2014; Townsend et al., 2014) and The United States of America (amongst various ethnicities such as African Americans, Hispanic and Asians) (Kogan et al., 2010; Brown & Venable, 2007; Langer et al., 2001; Park et al., 2005; Voisin et al., 2013). This is consistent with previous research that states that while there is evidence that there is an inverse relationship between risky behaviours and age (Ajayi, Marangu, Miller & Paxman, 1991; Akwara, Madise & Hinde, 2003; Chassin, Pitts & Prost, 2002; Johnston, O'Malley,

Bachman & Schulenberg, 2004; Kiragu & Zabin, 1995; Ochollo-Ayayo & Schwarz, 1991; O'Neill, Parra, & Sher, 2001; Schulenberg, O'Malley, Bachman, Wadsworth & Johnston, 1996), it is an unlikely outcome in communities characterised by poverty and lack of resources and access to educational and employment opportunities. These factors, with a historical and political genesis, are mutually influencing, resulting in a recurring process of risky behaviour and impoverishment. Along with these external factors, individual factors such as perceptions of self-identity, social identity, self-efficacy, sense of belonging and hope for the future play a significant role in contributing towards risky behaviours (Adams et al., 2014).

Despite the large body of theory and research that supports alcohol's role in risky sexual behaviour, understanding the nature of this relationship has been more challenging than originally anticipated (for reviews see Cooper, 2002; Halpern-Felsher, Millstein, & Ellen, 1996; Weinhardt & Carey, 2000). A possible contributing factor is that there were very few studies which utilised theoretical frameworks to structure the studies. The theoretical frameworks utilised attempted to summarize and make sense of individual and social factors contributing to alcohol use and risky sexual behaviour. These frameworks were used to understand the behaviour and help account for underlying mechanisms of the specific cohort's drinking and may ultimately explain points for more comprehensive intervention development and enhancement. Essentially, there is no one theory to explain the relationship between alcohol use and risky sexual behaviour. However, for an intervention to be successful a theory is needed to explain the relationship, understand the contributing factors and the patterns in the relationship and how it changes. Additionally, the use of theoretically based questionnaires with well-defined items is particularly important, since the diversity of content of research in this field restricts the comparability of findings and makes conclusions difficult (Kuntsche, Knibbe, Gmel & Engels, 2005).

According to Kuntsche et al. (2005), an explanation for these inconsistent results could be that motives affect drinking only in the onset phase and not the continuation to drink and indulge in risky sexual behaviour. From the research reviewed, there is consensus that internally caused motives such as coping, sense of belonging, and self-efficacy are strongly related with personality traits are more consistently related to alcohol use across drinking situations. However, since there is a lack of longitudinal evidence it is nearly impossible to determine the long-term effects of different drinking motives on different alcohol related

outcomes in different age groups within different contexts (Kuntsche et al., 2005).

Conclusions and Recommendations

Whilst there has been an increase in research attempting to ascertain and determine the key factors that make the relationship between the alcohol use and risky sexual behaviour significant, very few studies focused directly on the factors mediating and moderating this relationship. In spite of this, the studies and reviews which form part of this systematic review provide key insights into factors impacting on alcohol use and risky sexual behaviour. Further systematic enquiry and qualitative exploration at a primary level, will allow for an increased comprehension as to how these factors contribute specifically to the relationship between Alcohol use and risky sexual behaviour, as some young adults may engage in risky sexual behaviour but not necessarily engage in alcohol use, or vice versa. Many of these studies reviewed were also quantitative studies, thus, an in-depth understanding, across time, will allow for a greater understanding of these factors. As Cooper (2006) expressed, that the relationship between alcohol use and risky sexual behaviour is complex and cannot be explained by a single mechanism, but instead reflects multiple underlying causal and non-causal processes. Moreover, even the causal portion of this relationship is not apparent as a main effect but as an interaction. Therefore, there is a need to qualitatively explore young people's understandings, perceptions, and motivations to engaging in alcohol use and risky sexual behaviour. While these findings will be context-specific, this will be the foundation for studies that aim to quantitatively understand this relationship. Furthermore, there remains a need for research among young adults as a whole and not exclusively among young adults in school, colleges, university, or clinic/treatment setting. Other gaps in the literature point to the need for research across diverse socio-economic group.

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Public interest statement

There is a substantial body of evidence documenting the relationship between alcohol use and risky sexual behaviour. However, there is a dearth of empirical evidence highlighting the nature and complexity of this relationship, especially as it relates to intensity and frequency of alcohol use and contextual variables such as socio-economic status as well as gender and age. Similarly, the links between motivations for alcohol use and sexual behaviours are not well understood. Furthermore, it is noteworthy that the alcohol use-risky sexual behaviour link has not been adequately explored in young adults. The current study reviewed the literature available since 2000 relating to factors contributing to why young adults engage in alcohol use and risky sexual behaviour. A systematic review of global research was conducted. Results indicated that personality influences, social determinants, and interpersonal factors were related to alcohol use and risky sexual behaviour.

Review question

What are the factors that impact on the relationship between alcohol consumption and risky sexual behaviour among young people in the Western Cape?

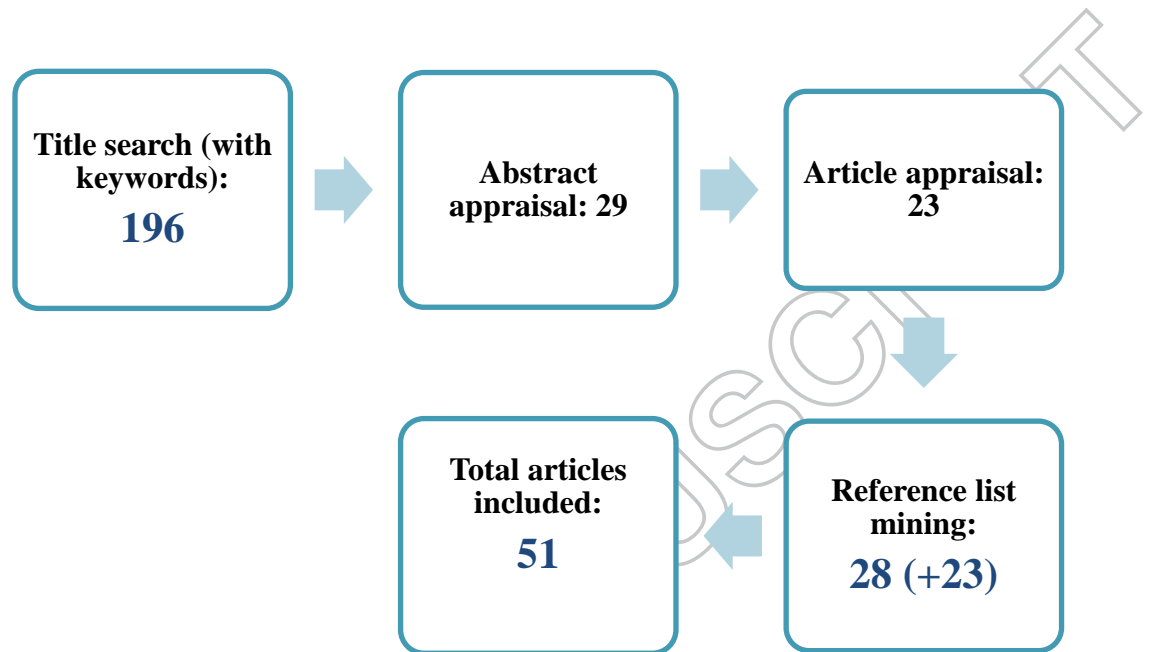


Figure 1. Article search and Appraisal process

Table 1: Type of research article

Article type	Amount	Authors
Empirical article	45	Abbey et al. (2005); Abby et al. (2007); Adams et al. (2014); Bailey et al. (2011); Brown & Vanable (2007); Charnigo et al. (2013); Connor et al. (2013); Foster & Neighbors (2013); Griffin et al. (2012); Gullete et al. (2006); Khasakhala et al. (2008); King et al. (2012); Kogan et al. (2010); LaBrie et al. (2011); LaBrie et al. (2008); Langer et al. (2001); Lewis et al. (2014); Littleton et al. (2007); Miller et al. (2003); Muchimba et al. (2013); Murry et al. (2013); Neighbors et al. (2007); Oei & Jardim (2007); Orchowski et al. (2012); Park et al. (2005); Parks et al. (2008); Patrick (2013); Patrick & Maggs (2010); Quinn & Fromme (2010); Radanielina-Hita (2015); Randolph et al. (2009); Schraufnagel et al. (2010); Seth et al. (2011); Sonmez et al. (2006); Stappenbek et al. (2001); Stuewig et al. (2015); Townsend et al. (2011); Townshend et al. (2014); Turisi et al. (2000); Vivancos et al. (2013); Voisin et al. (2013); Walsh et al. (2014); Walsh et al. (2013); Wayment & Aronson (2002); Wetherill et al. (2010).
Review article	6	Cooper (2002); Cooper (2006); Kuntsche et al. (2005); Oei & Morawska (2004); Pithey & Morojele (2002); Vicary & Karshin (2002);

Table 2: Thematic Domains

Thematic Domain	Authors
1. Personal influences on alcohol consumption and risky sexual behaviour	Charnigo et al. (2013); Griffin et al. (2012); Gulleto et al. (2006); LaBrie et al. (2008); Littleton et al. (2007); Miller et al. (2003); Murry et al. (2013); Oei & Morawska (2004); Quinn & Fromme (2010); Stuewig et al. (2015).
2. Social determinants of alcohol consumption and risky sexual behaviour	Abbey et al. (2005); Abby et al. (2007); Bailey et al. (2011); Connor et al. (2013); Khasakhala et al. (2008); King et al. (2012); Kuntsche et al. (2005); Lewis et al. (2014); Orchowski et al. (2012); Oei & Jardim (2007); Neighbors et al. (2007); Parks et al. (2008); Patrick (2013); Pithey & Morojele (2002); Seth et al. (2011); Stappenbek et al. (2001); Townsend et al. (2011); Turisi et al. (2000); Vicary & Karshin (2002); Walsh et al. (2013).
3. Interpersonal factors related to alcohol consumption and risky sexual behaviour	Adams et al. (2014); Brown & Venable (2007); Cooper (2002); Cooper (2006); Kogan et al. (2010); LaBrie et al. (2011); Langer et al. (2001); Muchimba et al. (2013); Park et al. (2005); Patrick & Maggs (2010); Radanielina-Hita (2015); Randolph et al. (2009); Schraufnagel et al. (2010); Sonmez et al. (2006); Townsend et al. (2014); Vivancos et al. (2013); Voisin et al. (2013); Walsh et al. (2014); Wayment & Aronson (2002); Wetherill et al. (2010).

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Table 3: Personality influences on alcohol consumption and risky sexual behaviour

1. Personality influences on alcohol consumption and risky sexual behaviour					
Author	Focus of research	Age cohort and Sample composition	Area/ context	Method	Framework
Charni go et al. (2013)	Elucidate the joint contribution of sensation seeking and impulsive decision-making, to HIV=STD risk behaviors among young adults.	n=2,386 young adults aged 18-26years. Various ethnic groups	Data utilized from a larger study from two cities: Lexington, Kentucky and Knoxville, Tennessee (Zimmerman et al., 2007).	Quantitative (Survey)	Five-factor model of personality (Zuckerman, 1994a).
Griffin et al. (2012)	Examined the extent to which high risk drinking and sexual behaviour clustered together.	Sample 1: 9 th grade mean age = 14.6 years. Sample 2: Adult assessment, mean age = 22.8 years (N = 692).	Participants were part of a larger school-based drug abuse and violence prevention trial.	Quantitative (Self-reported questionnaire – initial; Telephonic interview – adult assessment)	None
Gullete et al. (2006)	Examined the relationships of sexual sensation seeking, self-esteem, and self efficacy in condom use, and alcohol consumption to HIV risk-taking behaviors.	n= 3000 college students. 18 – 43 years.	Participants were located at a university in the southern United States.	Quantitative (This study was a descriptive and correlational survey.)	Transtheoretcal Model of Behavioral Change
LaBrie et al. (2008)	Examines the role self-consciousness plays in the experience of alcohol-related consequences	n = 1,168 student members of 20 campus organizations between 18 – 21 years 1% older.	West Coast University (USA).	Quantitative (Online Survey)	
Littleton et al. (2007)	Examined the associations between a history of physical or sexual abuse and recent sexual risk behaviors among adult women.	1,428 women aged 18 – 40 years old, who visited one of two clinics offering comprehensive reproductive healthcare	A low income community in Southeast Texas	Quantitative (Survey)	
Miller et al. (2003)	Explores the relations between the Five Factor Model (FFM) of personality and a variety of risky sexual behaviors	n= 242 men and n=239 women. Mean age = 21.		Quantitative (Questionnaires)	Five Factor Model (FFM) of personality
Oei & Morawska (2004)	Develops a cognitive model using the key constructs of alcohol expectancies and drinking refusal self-efficacy to explain the acquisition and maintenance of binge drinking.	Adolescents and young people. Literature on binge drinking		Literature review	Alcohol Expectancy Theory

Quinn & Fromme (2010)	Examined whether self-regulation was a protective factor against heavy episodic drinking, alcohol-related problems, and unprotected sex among emerging adults.	n=1,136 completed both surveys. Survey 1: 17 – 19 years. Survey 2: Mean age 21,75 years.	University of Texas at Austin	Quantitative (Longitudinal study; survey)	Self-regulation and sensation seeking
Stuewig et al. (2015)	Investigates the role of individual competence factors as modifiers of the risk for adult substance and alcohol abuse in relation to living in high- or low-income areas.	Study 1: n=80, 5 th graders (ages 10–12) Study 2: 68% re-interviewed (ages 18–21).	Nine public elementary schools in a suburban Washington DC	Longitudinal study	None

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Table 4: Social determinants of alcohol consumption and risky sexual behaviour

2. Social determinants of alcohol consumption and risky sexual behaviour					
Author	Focus of research	Age cohort and Sample composition	Area/ context	Method	Framework
Abbey et al. (2005)	Examines the effects of alcohol consumption on condom use	195 females 103 males aged between 21 35 years	Large urban university	Quantitative (Self-reported questionnaire)	None
Abby et al. (2007)	Explores alcohol use and risky sexual behaviour among young adults in a low-income community in Cape Town.	n= 143 (18 – 25 years).	An impoverished community on the Cape Flats in the Western Cape, South Africa	Quantitative Descriptive correlational design	None
Bailey et al. (2011)	Describes an example of the use of latent variable modelling to create measures of complex phenotypes and environments that illustrate the utility of the general versus specific conceptualization.	5 th grade students (N=765) = 49% female, 51% male, ethnically diverse. 95% (752) retained at age 24	Seattle Social Development a longitudinal study of the development of positive and antisocial Project behaviors.	Secondary Data from a longitudinal study	None
Connor et al. (2013)	Informing potential interventions to reduce sexual risk behaviours among university students in particular, and young people in general.	n= 5,770 students aged between 17 – 25 years.	8 New Zealand campuses.	A cross-sectional web-based survey	.
Khasak hala et al. (2008)	Examines factors that may predispose unmarried and unemployed out-of-school youth to risky sexual behaviour.	n= 6129 male and female unmarried and unemployed out-of-school youth aged between 15-24years.	Based on data gathered from the Behaviour Surveillance Survey. Kenya	Quantitative (structured questionnaire)	
King et al. (2012)	Associations between substance use disorder symptoms and high-risk sexual behaviours change across young adulthood	Seattle Social Development Project (SSDP), recruited in 1985 from 18 elementary schools drawn from high-crime neighbourhoods at ages 21, 24, 27 and 30 years.	High-crime neighbourhoods	Quantitative = Longitudinal study.	State and trait level theories
Kuntsc he et al. (2005)	Reviews evidence of adolescent and young adult drinking motives and their relation to possible consequences over the last 15 years.	Include articles published only in English. The literature search was restricted to publications from 1989 onwards, age	Predominantly North America	Systematic review	The motivational model

Lewis et al. (2014)	Examining Spring Break-specific normative perceptions of sexual risk behaviour and the role that these perceptions and taking a trip with a friend or with a romantic partner have on Spring Break sexual behaviour.	group of 10 to 25-year olds. N= 1,540 students Caucasian and Asian with a mean age of 20.3 years	A large public northwestern university	Quantitative (Online Survey)	
Murry et al. (2013)	Identifies mechanisms that forecast rural African American males' susceptibility to risk behaviours over time	Approx.78% of the original sample was maintained across five waves (W1:10.5years; W5: 20 -21years). N= 889 African American families in Iowa and Georgia. N= 411 families with male youth were included.	Iowa and Georgia	Quantitative (Questionnaires)	Conceptual Model (Family and economic stress theories and problem behavior theory)
Oei & Jardim (2007)	Determines whether Alcohol expectancies (AE) and DRSE predict alcohol consumption in Asian students.	Caucasian (<i>n</i> = 98) and Asian (<i>n</i> = 92) student samples. Mean age = 21.18 years	First-year psychology class.	Quantitative (Questionnaire)	AE and DRSE
Orcho wski et al. (2012)	Explores the relationship between alcohol use and experience of alcohol-related sexual consequences (ARSC) during the transition from high school to the first year of college.	447 men and 606 women with a mean age of 18.4 years and varied ethnicity.	New England colleges/universities	Quantitative (web survey)	
Neighbors et al. (2007)	Evaluates the relative contribution of social norms, demographics, drinking motives, and alcohol expectancies in predicting alcohol consumption and related problems among heavy drinking college students	17-21years. 818 (57.6% women) first year undergraduates	West-cost university (USA)	Quantitative (Web-based assessments)	
Parks et al. (2008)	To assess the rates of risky sexual behavior among women bar drinkers, as well as differences in predictors of risky sexual behavior, based on partner type—new or regular.	18 – 30 years. 241 women. Various ethnic groups	Women bar drinkers	Quantitative (interviews)	
Patrick	The extent to which Spring Break	18 – 21 years, <i>n</i> = 263;	Students planning on going on a	Quantitative (Web	

(2013)	drinking and sexual behaviours are related	55% women	Spring Break trip	survey)	
Pithey & Morojele (2002)	Focus on how alcohol misuse increases the occurrence of sexual risk behaviour in South African communities.	Articles on alcohol use and risky sexual behaviour in South Africa	South Africa	Review of literature	
Seth et al. (2011)	Examined the relationship between alcohol use at non abuse levels and risky sexual behaviors and sexually transmitted infections (STIs) among young adult African American women.	18 – 29 years, n=979 , 86.6% completed baseline assessments, 78.9% and 79.4% completed 6 and 12-months follow-up, respectively	Members from three Kaiser Permanente Centers having the greatest number of African Americans in Atlanta, GA	Quantitative (Audio Computer Assisted Survey Interview)	
Stappe nbek et al. (2001)	To identify patterns of alcohol use behaviours and alcohol expectancies among women who are non–problem drinkers and to examine how these patterns are associated with indices of sexual risk	18 – 35 years, 758 women, various ethnic groups.	USA	Quantitative (Questionnaire – various scales)	
Townsend et al. (2011)	The aim of this study was to examine the relationship between binge drinking, “reflection impulsivity” alcohol-related expectancies, and unplanned sexual behavior in a sample of young social drinkers.	18 and 34, n=92 (43 male and 49 female)	Cape Town, South Africa	Quantitative (Questionnaire)	
Turisi et al. (2000)	The nature of the relation among drinking beliefs, drinking tendencies, and behavioural consequences	Mean age of 18.24 years n= 266.	USA: A moderately sized Northwestern university	Quantitative (Battery of questionnaires)	
Vicary & Karshin (2002)	This article reviews the extent of the current alcohol problem as well as a historical perspective.	n=2000, college students aged 18 – 24 years.	United states. Colleges and universities	Review survey of literature	None
Walsh et al. (2013)	Test a path model that included perceived sexual control, sex-related alcohol expectancies, and likelihood of risky sexual behaviour when drinking as mediators between CSA and adult substance facilitated rape.	n=546 female college students. Mean age = 18.7 years	All female students enrolled in an introductory psychology course over three consecutive semesters	Quantitative (Anonymous surveys)	Traumagenicdynamics theory

Table 5: Interpersonal factors related to alcohol consumption and risky sexual behaviour

3. Interpersonal factors related to alcohol consumption and risky sexual behaviour					
Author	Focus of research	Age cohort and Sample composition	Area/ context	Method	Framework
Adams et al. (2014)	Explores alcohol use and risky sexual behaviour among young adults.	n=143, aged 18-25 years	An impoverished community on the Cape Flats , Western Cape, SA.	Quantitative (descriptive correlational design).	None
Brown & Venable (2007)	Clarify the impact of partner type on the alcohol-risky sex association.	N= 547 mixed race, with a mean age of 19 years, 67% female.	Introductory psychology courses	Quantitative (self-administered questionnaire)	Myopia Theory
Cooper (2002)	To evaluate the empirical associations between alcohol use and risky sex at two levels of analysis.	Published in the past 10 years and using event level methodology or random sampling were emphasized.	Published articles	Review	Myopia Theory and Expectancy models and, Spurious model.
Cooper (2006)	Reflects multiple underlying processes of relationship between AU and RSB that are both causal and noncausal	Articles based on theories trying to explain the relationship between alcohol use and risky sexual behaviour	Published articles	Review of literature	
Kogan et al. (2010)	Examined the protective influence of several variables hypothesized either to reduce unprotected intercourse or improve the influence of risk factors.	African Americans aged 18 to 21 years, not attending high school or enrolled full-time college or university	Seven counties in central Georgia.	Quantitative (audio computer-assisted self-interviews)	Ecological and self-regulatory theories of risk behavior.
LaBrie et al. (2011)	Examined the extent to which PBS mediated the influence of drinking motives	N=1592 with a mean age of 19.94 years; 76.9% Caucasian.	Two universities (Public and private).	Quantitative (Online surveys)	Mediational Model
Langer et al. (2001)	Understanding of the risk and protective factors on which many prevention programs	N = 388 aged between 17 and 27 years, 72.0% Hispanic.	Urban university in South Florida.	Quantitative (285-item questionnaire)	
Muchimba et al. (2013)	Examined alcohol use frequency in adolescence as a predictor of HIV sexual risk behaviour in adulthood.	Initial assessment: 15 – 18 years 2 nd Assessment: Mean time between assessments =	Colorado	Quantitative (Questionnaires)	



Park et al. (2005)	Examine the influence of alcohol consumption, gender, and psychological risk and protective factors on college students' experiences of negative and positive consequences	8.3 years. Varied ethnicity distribution. 84 men, 97 women; varied ethnicity mean age = 19	University of Connecticut.	Quantitative (Questionnaire)	
Patrick & Maggs (2010)	Person-centered associations in motivations across motivations for alcohol use and sexual behavior.	18 - 20 year old first-year students and U.S. citizens or permanent residents.	United States, Northeastern university	Quantitative (Web surveys)	
Radani elina-Hita (2015)	Parental mediation and critical thinking—that may influence the decision-making process	N= 658 aged between 18 – 21 years.	Northwestern American university.	Quantitative (Online Questionnaire)	Message Interpretation Model
Randolph et al. (2009)	To assess the role of gender and ethnicity in the relationship between alcohol use and risky sexual behavior.	18 – 34 years, n= of 425 (265 females and 160 males)	A southern university, USA	Quantitative (Questionnaire)	
Sonmez et al. (2006)	How cognitive and affective attitudes, personal normative beliefs, social determinants, expectations, and pacts influence intentions of excessive alcohol consumption and casual sex.	N = 534, age = 18 – 25 years	One Northeastern and one Southwestern university	Quantitative (Cross sectional – Questionnaire)	The Theory of Interpersonal Behavior (TIB)
Townsend et al. (2014)	Dynamics of social relationships in which alcohol use and risky sexual behaviors occur.	N=421 men aged 18-62 years.	One of the poorest suburbs in South Africa	Mixed Methods (Quantitative survey and in-depth interview)	
Schraufnagel et al. (2010)	Explored a potential connection between CSA and an increased likelihood of risky sexual behavior in adulthood.	n=280 males aged between 21 and 35 years	The greater Seattle	Quantitative (Self-reported questionnaire)	
Vivancos et al. (2013)	To quantify the effectiveness of school-based sexual education on risky sexual behaviour and STI acquisition in adulthood.	n=711 between 18-29 years.	University students	Quantitative (Online survey)	
Vivancos et al. (2013)	To quantify the effectiveness of school-based sexual education on risky sexual behaviour and STI acquisition in adulthood.	n=711 between 18-29 years.	University students	Quantitative (Online survey)	
Walsh	Testing a model specifying that	1,169 racially diverse	Large, public, urban	Quantitative	



et al. (2014)	traumatic intrusions after early abuse may increase risk for alcohol problems, which may increase the likelihood of engaging in SRB.	college students with a mean age of 20.7 years	Southeastern university	(Questionnaires)	
Voisin et al. (2013)	Examined associations among multiple theoretically informed risk and protective factors on unsafe sex	African American aged 15 to 21, were not married, currently pregnant, or attempting to get pregnant.	Three comparable STI clinics in Atlanta, Georgia.	Quantitative (Generalized estimating equation Models)	Ecological Model
Wetherill et al. (2010)	Tested the influence of sexual values and perceived awareness and caring, or beliefs about how much parents and peers know and care about student's behaviour on sexual behaviour.	N=1928 between 17 – 19 years old.	United states (High school and college)	Internet based surveys	None
Wayme nt & Aronson (2002)	A path model tested in order to assess specific hypothesized predictors of risky sexual behaviour.	n= 95 sexually active White female college students aged between 18 – 30 years	University in the Southwestern United States	Quantitative (Questionnaire)	Health belief model