



Health risk behaviours among university students in Saudi Arabia.

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Saudi Arabian university students' perceptions of health risk behaviours

Abstract

Purpose: The aims of this research were to investigate how and why Saudi Arabian students engage in specific Health Risk Behaviours (HRBs).

Methods: The study followed mixed methods, sequential and explanatory approaches. Quantitative data were collected by administering questionnaires among 722 students, and qualitative data through a series of interviews with 17 students.

Findings: The findings suggest that lifestyle and personal factors, as well as the economic, social and policy aspects of the associated environment, play a significant role in influencing students' HRBs. Recommendations based on findings include implementing comprehensive behaviour change interventions for young people as well as involving them in the design and dissemination processes of relevant policies.

Originality: This paper addresses an important gap in the research on health risk behaviours among university students from the perspectives of students.

Keywords: Health risk behaviours, prevention, intervention, university students, Saudi Arabia

INTRODUCTION

Health Risk Behaviours (HRBs) can be defined as the detrimental actions of people that not only cause impairment of their physical and/or mental health, but also death (Asarnow et al., 2014; DiClemente, Crosby & Santelli, 2009). DiClemente et al. (2009) suggest HRBs can directly or indirectly put at risk the social and psychological well-being as well as physical health of individuals. These behaviours can be exacerbated by any frequent or intense activity that increases the risk of diseases or injuries (French et al., 2010).

HRBs have long been recognised as a problem within university settings in developed countries where they are a major challenge for educational authorities, policy makers, administrators, and teaching staff (Patrick et al., 1997; Tavolacci, 2015; Deliens, Deforche, De Bourdeaudhuij & Clarys, 2015). There are indications of a high prevalence of engagement with HRBs among young adults in higher learning institutions in the Gulf States, but there is a lack of detailed evidence to support this, especially in Saudi Arabia, where research findings generally provide information on types of HRBs (Aleissa, 2001; Salameh et al., 2012). Aleissa (2001) identified a number of HRBs among adolescents visiting primary health care centres in one urban part of Saudi Arabia, and other studies have tended to focus on specific HRBs in isolation and across a wider range of people of various ages. These HRBs include reckless driving and flaunting of traffic rules (Tarawneh et al., 1993; Odero et al., 1997; Bendak, 2005; Abou-Zeid et al., 2009; King Abdulaziz City for Science and Technology, 2012), substance abuse (Faso and Salvador,

2001; Al-Haqwi, 2010), violent behaviour (Krug et al., 2002; Al-Turki, 2006; Mutaab, 2008; Bassiony, 2009), physical inactivity (Albawardi, Jradi & Al-Hazzaa, 2015; Al-Zalabani, Al-Hamdan & Saeed, 2015; Sisson & Katzmarzyk, 2008), unhealthy eating (Al-Rethaiaa et al., 2010; Washi, 2010), smoking (Jarallah et al., 1999; Al-Mohamed & Amin, 2010; Taha et al., 2010), and unprotected sex (Gańczak et al., 2007; Fageeh, 2008). This research redressed this lack of data by undertaking a more comprehensive approach to **investigate HRBs among students at a university** in Saudi Arabia (referred to in this paper as University X). The study therefore considered a cluster of key HRBs in addition to highlighting gender differences in the prevalence rates of HRBs. **The findings from this study will have the potential to inform policy and actions which may help reduce or alleviate HRBs in the future.** We focused on seven HRBs which previous studies have identified as most prevalent, not only in Saudi Arabian universities but also in other Western universities (Douglas et al., 1997; Brooks et al., 2006; Centre for Disease Control and Prevention, 2012; Eaton et al., 2012). These HRBs were behaviours that contribute to vehicle injuries, violence, tobacco use, drug and alcohol use, **unhealthy eating**, physical inactivity, and **sexually transmitted diseases**.

This paper seeks to answer three research questions:

- i) To what extent do Saudi Arabian students engage in specific HRBs?
- ii) How do the HRB prevalence rates differ between male and female Saudi Arabian students?
- iii) Why are students at University X engaging in HRBs?

METHODS

Research instruments

An anonymised questionnaire (see Appendix A) was designed based on closed questions from the United States National Youth Risk Behavior Questionnaire, and the United States National College Health Risk Behaviors Survey (NCHRBS) (Douglas et al., 1997). **The questionnaire was comprised of a range of multiple choice, Likert scale and frequency of behaviour questions, that are** associated with different aspects of safety, such as the number of times students wear a seat belt either as drivers or as passengers, how frequently they were involved in accidents, ignoring traffic lights and stop signs, or using mobile phones while driving (see Appendix A). **The Likert scale items** were scored on a ten-point scale consisting of three categories, namely 'never', 'sometimes', and 'always'. Based on the Warden et al. (2003) scale the scores 1-3 were classified as high risk, 4-6 medium risk, while 7 and above were taken as low risk on safety aspects. **Answers to the multiple choice questions and frequency of behaviour questions were collated and ranked.**

For the qualitative phase of this study, an interview schedule was developed. The purpose of collecting this qualitative data was to **gain insights** into the factors **which** influence university students to engage in HRBs; their knowledge of HRBs and experiences; the consequences of

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3 such behaviours; and the role that the university and its structural factors, **such as leadership,**
4 **curricula, and extra-curricular initiatives** play in preventing students from engaging in HRBs.

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6 **Both the survey and interview questionnaires were pre-tested to ensure validity including clarity,**
7 **quality of responses and relevance to the research questions.**

8 9 ***Participants and participant sampling***

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11 The study involved a total of 722 student participants, comprising 431 men and 291 women, who
12 were selected by using **cluster sampling**. Qualitative data were collected by interviewing
13 seventeen students (Male 7 & Female 10) to explore their opinions about the prevalence of
14 HRBs at the University X and associated reasons for these behaviours. **All the interviewees had**
15 **also participated in the survey.** The interview sample was selected purposefully.

16 17 18 ***Procedure***

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20 **After calculating a representative sample size from the total student population and ensuring that**
21 **the sample was taken from a range of different disciplines of the university,** a paper-based
22 version of the questionnaire was administered in the students' classrooms which provided a
23 relaxed and safe environment for the students. **Completing the questionnaire was voluntary.** The
24 questionnaire consisted of 53 questions which offered the students different possible response
25 options. The respondents were encouraged to take time in answering the questions and this
26 allowed them to complete the questionnaire accurately. Since the questionnaire could be
27 completed in approximately 20 minutes, the respondents were not under pressure. The length of
28 the questionnaires did not burden the respondents but also did not diminish the quality of
29 response.

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33 A male researcher (the first author) administered the questionnaires to male students, while a
34 female colleague was assigned by the authorities at University X to assist with administering the
35 questionnaires to the female students. **The reason for involving male and female administrators**
36 **was to help the students of each gender participate in the survey without shyness or**
37 **embarrassment.** Constant contact between the male researcher and his female colleague was
38 maintained to ensure the procedure of collecting the data was being followed in a consistent
39 manner. Students were provided with information explaining the objectives of the survey.
40 Because of the sensitivity of the questionnaire items, the students were requested not to share or
41 discuss their responses, and all the responses were anonymous. A fairly large sample was
42 selected through **cluster** sampling to improve on generalisability of the results and the study had
43 a high response rate of 82% (739 out of 900). However, 17 questionnaires were excluded from
44 the 739 questionnaires because they were invalid as most of their items were incomplete.

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49 The qualitative phase involved interviewing male and female students. Although the male
50 students were interviewed by the researchers, a highly skilled female colleague with experience
51 in conducting interviews assisted in interviewing the female students. The researchers
52 maintained constant contact with the female colleague by phone and email to ensure a smooth
53 data collection process. The interviewees were questioned in Arabic, the native language of the
54 participants. The process of conducting the interview began by confirming the time and the

location. Prior to the interviews, consent was obtained to audio-record the sessions. By recording the interviews, the researchers were able to pay attention to the verbatim responses multiple times before transcribing the audio files.

The study received ethical approval ([Grant Number:1438-50-02](#)) by the authors' university prior to the survey being administered. All the participants took part in the study after giving written consent. It was made clear to the students that they were free to withdraw from taking part in the survey at any point and that they did not need to complete a question if they did not wish to do so. Their identities were concealed and they were not required to write their names on the questionnaires. The participants were assured that the questionnaire and interview responses would only be accessed by the researchers and would not be made accessible to other parties. Moreover, they were informed that the data would be used only to complete the study and not for any other purpose.

Data analysis

The survey data were processed and analysed using the computer application SPSS ([Version 18.0, IBM](#)). Cumulative descriptive statistics were derived, and the extent of students' engagement in HRBs were tabulated into percentages and mean scores. The key benefits of using descriptive analysis were its strengths in describing a large dataset in simplified manner, and also it helped the researchers to focus on specific variables, such as HRB types, gender and age. Inferential statistical analysis which is used to establish statistical differences between male a female response was not possible due to the variation in the type of responses in the questionnaire. The interview data were analysed thematically involving coding and text categorisation. Both qualitative and quantitative data were compared and contrasted to gain reliable findings. This cross-evaluation process provided rich perspectives from the students in order to answer the research questions (Teddle & Tashakkori, 2009).

MAIN FINDINGS

The findings are presented under each HRB explored in the questionnaire and the interviews. Quantitative and qualitative data are included in each section.

Participant demographics were established by the survey questionnaire which are summarised in Table 1.

Table 1. Profile of respondents

Respondents' Profiles		Gender		Total	%
		Male	Female		
Marital status	Married	3	44	47	6.5%
	Divorced	6	11	17	2.4%
	Widowed	2	2	4	0.6%
	Never Married	420	234	654	90.6%

	Total	431 (59.7%)	291 (40.3%)	722	
	Alone	55	7	62	8.6%
	Spouse	2	34	36	5.0%
Person with whom they live	Relative	52	5	57	7.9%
	Friends	27	8	35	4.8%
	Parents	294	236	530	73.4%
	Missing	1	1	2	0.3%
	Total	431	291	722	

Table 1 shows that the vast majority of students had never been married. This is expected since most Saudi Arabians get married at the age of 23 or older (Al-Khateeb, 1998). Only a small number of the students fitted into the 'married', 'divorced' or 'widowed' categories (total 9.5%). Almost three quarters of the students who responded (73.4%) still lived with their parents even though they were studying at university. The norm in Saudi Arabia is that children stay with their parents until they get married.

Table 2. Mean and standard deviation of age, current year of study and grade of students

Questions	Respondents who answered the questions	Minimum	Maximum	Mean	SD
Age	718	19	28	20.77	1.34
Current year at college	720	0.5	6.0	2.43	0.97
Grade points	686	1.20	4.96	3.61	0.67

According to Table 2, most of the respondents were young adults within the age range of 19-28 years, the mean age being 20.7. Most of the respondents were in their second year with some in their sixth year at university. Even though the majority of students lived at home, they spent a considerable amount of time at the university and parental influence was likely to wane the longer they were at university. Borawski et al. (2003) indicated that lower levels of parental supervision increased the likelihood of adolescent involvement in risky behaviours, and the same may be true for the students in this study. The mean grade point average (GPA) of 3.61 indicates that most of the respondents were academically able but not highly able, given that the Saudi university system uses a cumulative GPA to grade students' performance on a scale of 0-5.

The survey findings and the responses of the interviews revealed that the Saudi students at University X were engaged in six major types of HRBs, namely: violation of traffic rules; violent behaviours and crimes; smoking and drug consumption; unhealthy eating habits; physical inactivity; and sexual behaviours. Questionnaire responses showed that one of the most prevalent HRBs among the students was being engaged in risk behaviours that contribute to vehicle injuries, for example ignoring traffic lights (Mean =11.6 times), exceeding the speed limit (Mean=17.5 times) and using a mobile phone while driving (Mean=18.9 times). Interview data also confirmed that students violated traffic rules but it was limited to male students only as

women were not allowed to drive at the time of the study. Some of the HRBs identified were the 'show-off tendency and the act of heroism' (M4) of male students, and driving without a driving license or not wearing a 'seat belt while traveling' (F4). The females, who were driven around by male relatives or other drivers, frequently did not wear seat belts (F9). Questionnaire data also indicated that both male and female students made minimum use of seat belts while driving or being driven in a car (mean score of 3.07 on a scale of 1-10, where 1 = never and 10 = always). Based on the Warden et al. (2003) scale, this could be classified as high risk. The results also highlighted gender differences in exposure to this risk. For instance, female participants reported the least use of seat belts while being driven in a car (Mean = 1.95 on a scale of 1-10) compared to their male counterparts (Mean = 3.82). Male respondents indicated that they had been exposed to various traffic risks while driving. There are indications that these risky behaviours had translated into frequent accidents. For instance, these respondents also indicated that on average, they had been involved in a car accident 2.65 times in their lifetime. This reflects recent statistics from Saudi Arabia that on an average 25 deaths occur every day due to road traffic accidents caused by risky driving behaviours of young people (Arab News, 2016). However, a wide variation was reported with regard to prevalence of accidents, with some respondents reporting having been involved in more car accidents in their lifetime than others.

Quantitative results show that HRBs also contributed to violence. For example, 9.8% of all respondents (Male 11.8% & Female 6.9%) carried a weapon such as a gun and knife for at least 13.6 days on average in the previous 30 days. Moreover, 22% of all respondents indicated having been involved in a physical fight on average three times in the previous 12 months. More men than women were involved in physical fights (Male 23.2% & Female 19.6%). The interview data builds on the evidence provided by the questionnaire data. For example, the participants reported that many students carried a knife which 'they show or use while in a heated argument with others or in a physical fight' (M2). When asked to elaborate, the interviewees claimed that students carry weapons as a cultural practice. This practice was also present among some female students who are believed to engage in physical fights for trivial reasons. There was general recognition among interviewees, both male and female, that many students were 'harsh and impolite' (F6) and exhibited rude and uncouth manners within the university premises that could provoke a violent reaction (F6, M1 and M6).

According to the survey findings, the level of cigarette and tobacco intake by the students was high. Regarding tobacco use, 468 (64.8%) respondents had tried smoking at some time in the life, and more men (N=346, 73.9%) reported to have smoked compared to women (N=122; 26.1%). The analysis shows that the average age at which students were first exposed to smoking was 17.2 years, with men likely to start earlier than women (Mean Age Males = 16.7 years, Females = 18.5 years). Qualitative data corroborated these findings as during the interviews, the students affirmed that besides high rates of smoking, some students were also exposed to various other drugs. One participant reflected on the dismal picture of the environment within the campus and stated that he was 'very annoyed by the density of smoking inside the university building' (M3), that is suggestive of very high levels of tobacco use by students.

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3 Given the sensitivity and the legalities surrounding alcohol and other drug use in Saudi Arabia,
4 the students were asked whether they had observed their close friends using particular drugs,
5 rather than having to describe their own habits. The findings **showed** that on average 4% of the
6 respondents reported that they knew someone who had chewed khat (the leaves of an Arabian
7 shrub, which are chewed as a stimulant) in the previous 12 months, while 7% **mentioned** they
8 knew people who had taken steroid pills without a doctor's prescription. A quarter (25%) of the
9 respondents indicated that they had encountered someone of their age who had been drinking
10 alcohol, whilst 11.5% indicated that they knew someone who had smoked marijuana. Moreover,
11 5.1% reported that they had been invited to use cocaine and crack in the previous 12 months.
12 Further in relation to drugs, 6.5% of the respondents reported having watched close friends sniff
13 glue, or breathe the contents of aerosol spray cans and paints to get 'high'. This suggests that a
14 major contributor to the use and abuse of alcohol or drugs was the influence of peers, or peer
15 pressure. Gender differences are manifested among those who have experienced or observed
16 drug use. For instance, more men (N=75; 89.3%) have reportedly met or observed someone
17 using illegal drugs more than once (1.7 times on average) in the previous 12 months. On the
18 other hand, only nine women (10.7%) reported having observed a friend using illegal drugs.
19 During the interviews, the students explained that smoking tobacco was common among male
20 and female students and that those living in University campus accommodation regularly take
21 drugs, often due to peer pressure or lack of parental supervision. A number of interviewees
22 attributed these HRBs to the adverse consequences of globalisation and the influence of foreign
23 cultures as well academic pressure (M1, M2, F9). For example, one female student was of the
24 opinion that students consume drugs 'to reduce stress and exam fear' (F9).

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31 Unhealthy dietary behaviours were also investigated. This entailed questions about eating habits,
32 including whether or not students had breakfast and whether or not they ate fast foods from a
33 restaurant. The results indicated poor dietary behaviours such as skipping breakfast and
34 consumption of fast foods. Whilst on average students had breakfast five days a week, they also
35 had fast food four days a week. Gender differences were apparent in this risk behaviour, with all
36 women having breakfast (Female 100%) compared to males (48%) and ate less fast food (Female
37 17.64%) in a week compared to their male counterparts (51%). A number of reasons for this
38 gender-based difference were identified through the interviews. Students stated that in Saudi
39 Arabia, a highly male dominated society, males go out with friends to fast food restaurants more
40 frequently than females, whilst females stay indoors unless escorted (Al Alhareth, Al Alhareth,
41 & Al Dighrir, 2015; Elamin & Omair, 2010). On such occasions, students 'love to take rich oily
42 food' (F6) and the consequences of such unhealthy dietary behaviours were obesity (M6, F1) and
43 the inability of 'young females' to 'climb stairs' (F8).

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48 **The survey findings revealed a high prevalence of physical inactivity.** With regard to physical
49 activity, results indicated that on average students were physically active approximately 3 to 4
50 days in a week. During such time, they reportedly participated in physical activity that made
51 them sweat and raised their heart rate, or engaged in such exercises to strengthen or tone their
52 muscles through activities such as football, running, swimming, push-ups, sit-ups, weightlifting,
53 or aerobics. **A difference in terms of gender was also reported**, with men having a higher rate of
54 physical activity (Mean = 3.7; 39.3%) relative to their female counterparts (Mean = 3.45;
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13.5%). However, for the remainder of the week they were physically inactive. The interview findings showed that the hectic schedules at the university, busy lifestyles and staying away from family had exerted an influence over students' eating habits and physical activity. In terms of unhealthy eating habits and physical inactivity, survey and interview findings showed there is a difference between the male and female students. Overall, the results revealed that, while the male students were more prone to unhealthy eating habits, female students were found to be more physically inactive.

Finally, the study explored the level of awareness of sexually transmitted diseases (STDs). Survey responses to STD awareness questions indicated that most of the students in this university had no information about STDs (68% Women, 64% Men). HIV/AIDS and Hepatitis were the specific STDs that the respondents were aware of which can be attributed to a lack of education. This low level of awareness of STDs indicates that the students (Males 95.1%; Females 95.5 %) had not been tested for such diseases. During the interviews, students elaborated that the presence of sexual diseases among a few students was due to the increasing number of 'illegal' relationships (M7) among male and female students, which is against the long-standing cultural traditions of Arabic communities.

DISCUSSION

The integration of quantitative and qualitative findings investigating six HRBs resulted in a more comprehensive picture on the HRBs of students at University X in Saudi Arabia. In answer to research question 1, the findings have established the prevalence of these six key HRBs among a significant proportion of the student population and have shown gender differences between male and female students that answers research question 2. The research has also highlighted emerging perspectives on why young adults engage in risky behaviours in answer to research question 3. These features of the research have not been explicitly investigated before in a single study in the context of Saudi Arabia. The research therefore offers original insights into the engagement of HRBs by students in Saudi Arabia including some inconsistencies between the findings in this investigation and those of previous studies (Aleissa, 2001). These are discussed below.

Behaviours that contribute to vehicle injuries

As indicated in the results, HRBs that can contribute to vehicle injuries were prevalent amongst the respondents, with respondents indicating that they rarely wore a seat belt while in a car. Whereas this is a legal requirement in Saudi Arabia, students at University X seemed to ignore it, and females appeared to be most at risk as they very rarely wore seat belts when being driven around. This finding is unique as in Saudi Arabia, women were not allowed to drive until July 2018. The response of all respondents (Mean 3.07) suggested that not wearing seat belts can be considered as one facet of a pattern of general risk-taking behaviour. The interviews also confirmed that many students were driving recklessly, ignoring traffic rules, driving without licenses and not using seat belts. This result validates the findings of Bendak (2005) who found that two-thirds of residents in a Riyadh suburb did not wear seat belts. Nonetheless, Bendak's (2005) study also showed higher rates of seat belt use in another suburb, where 87% of

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3 respondents indicated compliance. The differences may partly be due to the differences in
4 location of the studies and the fact that the study on which this paper is based investigated
5 university-aged young people, rather than middle-aged people. Whilst Bendak highlighted the
6 prevalence rate, he did not specify rates by gender. In this study, the high prevalence of women
7 who did not wear a seat belt may have been due to the fact that Islamic tradition bars the police
8 (who are male only) from checking female passengers. Moreover, it could also be the case that
9 female passengers ride in the back seat and so under the law they are not obliged to wear seat
10 belts. However, drivers reported not wearing seat belts on several days in spite of police presence
11 on the highways. This may call for more research about why drivers are not deterred from
12 practising this risky behaviour.
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16 Quantitative and qualitative findings showed that students ignored traffic light and speed limit
17 regulations frequently. These behaviours can be explained by the inaction of the highway police
18 in implementing traffic law. Moreover, it also points to the inadequate training that these young
19 adults receive while learning to drive, a view proffered by Tarawneh et al. (1993) more than two
20 decades ago. These risky behaviours are reflected in the high prevalence of road accidents in
21 Saudi Arabia also shown among these students. This finding echoes findings by Patton et al.
22 (2009) and Odero et al. (1997) who suggested that young adults were the group most frequently
23 involved in road accidents in developing countries, for example sub-Saharan Africa and
24 Southeast Asia. Whereas most of the road accidents in developing countries are due to alcohol,
25 but this may not apply to Saudi Arabia given that Islamic tradition bans the consumption of
26 alcohol. These findings therefore imply that the risky behaviours mentioned above and others,
27 such as using mobile phones while driving, could be the cause of so many accidents and may
28 have their basis in a different set of reasons, which require further investigation.
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33 ***Behaviours that contribute to violence***

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35 Quantitative and qualitative findings also indicated that some respondents were involved in
36 behaviours that contributed to violence. Some students (9.8%) reported carrying weapons on a
37 frequent basis (Male 11.8% & Female 6.9%). Though not explicitly indicated in the survey, the
38 interview data confirmed that this habit happens both on and off campus. This implies that
39 students at University X were feeling insecure about their personal safety. Although only 9.8%
40 of respondents reported carrying guns, this is high and suggests that the presence of weapons
41 inside and outside of universities represents a serious threat to the lives and safety of other
42 students and is therefore alarming. This finding is similar to that reported by Mutaab (2008), who
43 found that young adults carry weapons to protect their female siblings from harassment and also
44 as a way of projecting ethnic identity. However, the current study focuses on university students,
45 and interview data indicated that the practice of carrying lethal weapons often relates to risky
46 behaviours. It exerts a strong influence on health, for example violent behaviours, physical fights
47 and fight-related injuries. Literature suggests that the highest risk for weapon carrying was
48 associated with bullying and ethnic discrimination (Mutaab, 2008). Whilst no causal effect can
49 be elicited from the data, it could be inferred that those who engage in physical fights may also
50 be involved in other risky behaviours. This is because engaging in a risky behaviour can set the
51 stage for engaging in other risky behaviours like smoking and substance abuse (Davis et., 2015;
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3 **Rudatsikira et al., 2008).** Our study found that a higher proportion of women than men reported
4 that they had been involved in physical fights, even though they appear to be less involved in
5 other HRBs than their male counterparts. This implies that there could be variations in the
6 concurrence of HRBs in some individuals. Therefore, the finding from this study suggest that it
7 may not be generalisable that one's involvement in a particular HRB necessarily makes them
8 indulge in other HRBs as had been earlier argued by Jessor (1992).
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11 ***Tobacco use***

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13 It is apparent that the majority of respondents (64.8%) had tried smoking at some time in their
14 lives and/or continue to do so. Interview data showed that besides higher rates of smoking, the
15 students were also exposed to various other drugs, such as Moassal, Shisha, Snuff and Khat.
16 Similar findings were reported by Jarallah et al. (1999), Bassiony (2009), and Al-Turki, (2006).
17 Nonetheless, most of these empirical studies were conducted with the adult population outside of
18 a university setting. The current study adds to such findings in relation to university students, a
19 section of the population which had previously been largely ignored. These findings also bring a
20 new perspective to the risks associated with smoking in that they refute earlier assumptions
21 indicating that smokers (34.4%) in Saudi Arabia were mostly illiterate and involved in manual or
22 casual labour (Jarallah et al., 1999; Bassiony, 2009).
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26 Reported gender differences in tobacco use may be partly due to the cultural dogmas that
27 perceive female smoking as abominable. Moreover, male adolescents are accorded higher
28 personal independence at younger ages compared to women and so they have the liberty to
29 frequent places where smoking is regarded as another form of social entertainment by young
30 people (Taha et al., 2010).
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33 ***Alcohol and other drug use***

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35 Very few respondents reported in the questionnaires and during interviews that they used drugs
36 other than alcohol. It is imperative to interpret these findings with caution because Saudi Arabia
37 is a conservative society with a clear Islamic culture where alcohol and drug use is considered
38 taboo. Despite stressing that these responses would remain strictly anonymous, it is most likely
39 that the figures reported here are suppressed, given that Sharia law bans the use of alcohol and
40 other drugs. Such suppression could partly explain the inconsistency in findings between the
41 current study and those of Al-Haqwi (2010) who had also used an anonymous and self-
42 administered questionnaire to examine medical college students' perceptions of alcohol abuse
43 and drug use in Riyadh. However, that study only collected data on students' perceptions of
44 alcohol abuse and drugs and did not focus on the students' actual use of these substances. The
45 students in the current study stated that alcohol and substance abuse is a common problem in the
46 community, which had a much larger sample size. A quarter of the 722 respondents reported at
47 least knowing one friend who drinks alcohol, a figure which is significant, given the laws that do
48 not permit drinking alcohol . One of the possible reasons for this upward trend in the use of
49 alcohol is the fact that the Saudi community is opening up to the world so fast that young adults
50 have adopted Western lifestyles. Qualitative data substantiated these results, as some
51 interviewees reported that students were increasingly using 'Mossal' and alcohol. They attributed
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3 such behaviours to globalisation and exposure to foreign cultural goods. Interview data also
4 showed that students' inability to abstain from alcohol and drug use was linked to peer pressure.
5 The wider gender disparities reported in our findings with regard to the use of alcohol and drugs
6 could also be attributed to a highly male dominated conservative culture which does not promote
7 the social participation of women (Al Alhareth, Al Alhareth, & Al Dighrir, 2015; Elamin &
8 Omair, 2010).
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11 *Unhealthy dietary behaviour*

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13 Reports of skipping breakfast and consuming fast food were indications of unhealthy dietary
14 behaviours among the student participants, with similar proportions in terms of gender involved
15 in this behaviour. Interview results also indicated that students did not follow a healthy dietary
16 plan and were prone to eating food rich in fat. The prevalence of fast food consumption could be
17 attributable to changes in the eating patterns of families in Saudi Arabia that are now
18 characterised by snacking and fast food consumption (Al-Rethaiaa et al., 2010). Moreover, there
19 is an increasing change in lifestyle in Saudi Arabia, where Western diet and fast food restaurants
20 are replacing the traditional diet (Midhet et al., 2010; Washi and Ageib, 2010). This trend could
21 also be attributable to an emerging tendency for families to leave their homes in the evening
22 when it is cooler and eat in fast food restaurants (ALFaris, Al-Tamimi, Al-Jobair & Al-Shwaiyat,
23 2015). As there is a decrease in the number of employed domestic helpers in Saudi Arabia, partly
24 due to the lowering of wages and reports of abuse of foreign workers (Saudi Gazette, February
25 2018), some families who do not have expatriate household workers may choose to eat fast food
26 rather than cook for themselves. These eating habits, formed whilst a child is living with his or
27 her family, appear to remain with them into adulthood and attend university. The habit of
28 skipping breakfast could be attributable to changing sleep patterns in a country where people
29 choose to stay awake at night and extend their sleep later into the day and hence go without
30 breakfast (Bahammam, 2005).
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36 *Physical inactivity*

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38 The survey results indicated that students were physically inactive and that the phenomenon was
39 commonly found among women who do not exercise to lose weight or to keep from gaining
40 weight. Interview findings provided more insight into why the students were physically inactive,
41 and some of the common reasons reported by most students were a busy university schedule,
42 staying in hostels and away from parental influence, and increased intake of fast food. These
43 results confirm previous Saudi studies that have reported increasing levels of physically
44 inactivity (Albawardi et al. 2015; Al-Zalabani et al. 2015). Albawardi et al. (2015) had focused
45 on women working seven or more hours per day while Al-Zalabani et al. (2015) used a nation-
46 wide survey to determine the levels of physical activity in the Saudi population. Both the studies
47 found that different regions reported a high prevalence of low physical activity. In contrast, our
48 study focused on university students and since the findings could be highly context bound it may
49 not generally be applicable to most parts of the country. The reason for this could be that
50 University X is located in a multi-ethnic and diverse neighbourhood, which provides male and
51 female students access to gymnasiums. The gender differences with men reporting slightly
52 higher rates of physical activity as compared to their female counterparts may be due to the
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3 traditional nature of Saudi society that restricts women walking alone in public places without a
4 male escort. Survey and interview results substantiate the findings of Sisson and Katzmarzyk
5 (2008), who reviewed the global prevalence of physical activity in youth and adults, and
6 classified Saudi women as physically inactive.
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8 9 *Sexual behaviours that contribute to STDs*

10 Given the private and sensitive nature of sexual behaviours, particularly in Saudi Arabia direct
11 questions about sexual activity were avoided during interviews and in the questionnaires. The
12 questions were restricted to knowledge levels of STDs that the students possessed and the
13 quantitative and qualitative findings indicated that both male and female students at University X
14 have little knowledge in this area. However, this result should be interpreted with caution given
15 that answers may have been suppressed since sexual behaviours are still not regarded as a topic
16 for public discussion. Nonetheless, such a finding could be a pointer to a bigger problem in terms
17 of lack of knowledge of STDs and could be attributable to the fact that there are few health
18 education campaigns run in the country to make young people aware of the risks of STDs
19 (Fageeh, 2008; Al-Malki, 2014). Sexual health literature is similarly sparse, which may
20 exacerbate their ignorance. Low awareness of STDs could have been an important contributing
21 factor to the students' almost non-existent level of HIV/AIDS testing, although such testing is
22 freely available to all citizens in the country. Whereas this scenario could imply that the
23 respondents did not perceive themselves to be at the risk of contracting HIV, it may also be the
24 case that young adults fear going for testing as it is against Sharia law for unmarried persons to
25 be involved in sexual encounters (Gańczak et al., 2007).
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31 **CONCLUSION AND IMPLICATIONS**

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33 This research draws attention to the perspectives of university students regarding the multiple
34 types of health-risk behaviours that they engage in, particularly reckless driving, indulgence in
35 violence, tobacco, alcohol and drug abuse, unhealthy dietary behaviours, physical inactivity, and
36 unprotected sexual encounters. It had provided an important basis for understanding the key
37 factors which potentially influence such behaviours. Quantitative and qualitative findings
38 indicated that HRBs are related to social, economic, structural and individual factors.
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41 Findings also indicate that peer pressure may contribute to certain HRBs such as smoking and
42 the lack of family influence can affect students' dietary behaviours whereas inadequate
43 information about STDs/HIV and Aids contributes to risky sexual behaviour. Students who
44 reside within the campus of the educational institution were exposed to health-risk behaviours
45 that seem to be heightened by distance from their families or lack of parental supervision. The
46 study also revealed that students who engage in any one HRB may engage in others. The role of
47 gender in students' engagement in HRBs has also been revealed.
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51 Our investigation was motivated by the scarcity of studies on HRBs in Saudi Arabia and
52 therefore the findings add to extant literature on this topic. This is the first study to investigate
53 such behaviours and identify clusters of unhealthy behaviours among university students in
54 Saudi Arabia. Whilst some results are similar to those of previous studies such as that of Aleissa
55 (2001), there were some apparent contradictions. For example, contrary to the findings of
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3 Jarallah et al., (1999), which indicated that smokers were mainly illiterate, married, and involved
4 in manual labour, this paper brings a new perspective to the smoking problem by highlighting the
5 fact that the habit is also prevalent among university students. Further, this paper takes a wider
6 view on conceptualising the health risks relative to other studies given that more risky
7 behaviours are examined, including HIV and Aids, alcohol and other drug abuse, among young
8 adults in the country. These have been contentious topics and most studies have avoided them
9 due to, among other reasons, religious and social constraints. As such, this study has been one of
10 the first to investigate issues regarded as very sensitive by the Saudi community and could form
11 the basis for further studies in the area. Moreover, the study highlights the gender aspects
12 associated with the variations in the levels of HRB occurrence and calls to attention the
13 differences in risk between men and women for some HRBs.
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17 The findings of this study are context-specific which limits generalisability to the country as a
18 whole. The area where the study took place is similar to other cities of Saudi Arabia, but slightly
19 different compared to other parts of the country since it is less traditional, much more multi-
20 ethnic and more liberal. The social environment in Saudi Arabia has made this city as well as
21 others such as Dammam, Al Khobar, etc., more prone to global influences, which may variously
22 influence the behaviours and responses of young adults in this particular university. Therefore,
23 the views expressed here may not reflect those of university students throughout the country.
24 Nevertheless, some of these weaknesses were ameliorated by using a large sample size and
25 cluster sampling to improve the representativeness of the sample to the wider population. The
26 fact that confidentiality was guaranteed could also have improved the credibility of the
27 responses.
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31 The study supports the need for interventions that would limit the occurrences of HRBs amongst
32 these university students. For example, at policy level, it is important for the university
33 management body to take initiatives to include HRBs related content in the curricula. At practice
34 level faculty members should be well prepared to disseminate information about HRBs
35 effectively. The university as a whole or individual departments should run awareness building
36 campaigns among students and staff members that include knowledge and skill development.
37 Peer pressure was found to be a contributing factor in the engagement of certain HRBs such as
38 smoking and education programmes that make use of other students' experiences should be
39 considered (Mellanby, Rees, & Tripp, 2000). Involving young people in the design and
40 dissemination of the practices and policies that promote healthy lifestyles is not only
41 empowering for students but it is also necessary so that the programmes are credible and
42 therefore more likely to succeed (Gutuskey, et al., 2014). Whilst such education campaigns and
43 precautionary measures are clearly necessary, the universities in Saudi Arabia should also
44 consider supporting rehabilitation programmes for the students who have been suffering from
45 various HRBs. The research has presented evidence to support the need for all of these
46 interventions and the need for a comprehensive behaviour change approach that is "youth
47 friendly" and educative for students (DiClemente and Prochaska, 1998). Most importantly, there
48 is a need for strengthening the guidance and counselling department at the university that had
49 responsibility for overseeing the wellbeing of its students. We recommend that these rigorous
50 measures should to be taken to address students' unhealthy behaviours.
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3 This study was conducted at one university in Saudi Arabia, which may cause bias. Therefore,
4 more studies have to be conducted in other cultural and social settings. Besides, there is a chance
5 of a social desirability bias because all the responses collected as data were self-reported. This
6 bias can be minimised through repetitive investigations of HRBs and by collecting more
7 qualitative data through interviews from different universities in Saudi Arabia. This will
8 hopefully provide a more comprehensive picture of the prevalence of HRBs amongst university
9 students nationally. Moreover, there is need for conducting longitudinal studies to track changes
10 in prevalence rates over time. These data would provide more reliable results that would better
11 inform policy with regard to HRBs compared to cross-sectional studies. Finally, we recommend
12 further investigation of interactions between the different HRBs, as some reports have suggested
13 the possibility of co-existence of some HRBs (Thomas, 2009). This would provide a more
14 holistic understanding of HRB prevalence mechanisms.
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Appendix (A)

Instructions:

This survey is about health behaviour. It has been developed so you can tell us what you do that may affect your health. The information you give will be used to develop better health education for young people like yourself.

DO NOT write your name on this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do or know.

Completing the survey is voluntary. Whether or not you answer the questions will not affect your grade in this class. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of students completing this survey. The information will not be used to find out your name. No names will ever be reported.

Make sure to read every question. Fill in the ovals completely. When you are finished, follow the instructions of the person giving you the survey.

**Students Risk Behaviours
Questionnaire**

1. How old are you?

.....: years

2. What is your current year in college?

.....year

3. What is your subject.....

4. How tall are you without your shoes on?

Directions: Write your height in the shaded blank boxes. Fill in the matching oval below each number.

..... :Centimetre

5. How much do you weigh without your shoes on?

Directions: Write your weight in the shaded blank boxes.

.....:Kg

6. How would you describe your grades in school?

A.....GPA

7. What is your marital status?

- A. Married
- B. Divorced
- C. Widowed
- D. Never been married

8. With whom do you currently live?

- A. Alone
- B. Parents
- C. Spouse
- D. Other relative
- E. Friends

9. How often do you wear a seat belt when riding in a car driven by someone else?

Never					sometime					always
1	2	3	4	5	6	7	8	9	10	

10. How often do you wear a seat belt when driving a car?

Never					Sometime					Always
1	2	3	4	5	6	7	8	9	10	

11. During your life how many times have you been involved in car accident?

- A. I do not drive a car
- B.time/times

12. During the past 12 months, how many times have you beaten the traffic light?

- A. I do not drive a car
- B. time/times

13. During the past 30 days, on how many times did you exceed the speed limit?

- A. I do not drive a car
- B. time/times

14. During the past 30 days, how many days did you drive a car or other vehicle while texting or talking on a mobile phone?

- A. I do not drive a car
- B. time/times

15. During the past 30 days, on how many days did you carry a weapon such as a gun, knife, or club?

- A. Never
- B. days

16. During the past 12 months, how many times were you in a physical fight?

- A. Never
- B. time(s)

17. During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?

- A. Yes
- B. No

18. If you have a personal problem, in your life, how who are people can you trust to talk to?

- A. Specialist
- B. Parents
- C. Friends
- D. Siblings
- E. Spouse
- F. No one

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19. Have you ever tried cigarette smoking, even one or two puffs?
A. Yes
B. No
20. How old were you when you smoked a whole cigarette for the first time?
A. years old
B. I have never smoked a whole cigarette
21. During the past 30 days, on how many days did you smoke cigarettes?
A. Never
B. days
22. During the past 30 days, on how many days did you smoke Mosaal?
A. Never
B. days
23. During the past 30 days, on how many days did you smoke Sheesha?
A. Never
B. days
24. During the past 12 months, did you ever try to quit smoking cigarettes?
A. I did not smoke during the past 12 months
B. Yes
C. No
25. During the past 12 months, did you ever try to chewing Khat?
A. Yes
B. No
C. I prefer not to answer
26. During your life, how many times have you taken steroid pills without a doctor's prescription?
A. Yes
B. No
C. No response
27. What do you think is the maximum numbers of times any of your closest friends have used illegal drugs in the last 12 months?
A. Never
B. times
28. During your life, did you encounter someone your age who has been drinking alcohol?
A. Yes.
B. No.
C. I prefer not to answer
29. During your life, did you encounter someone your age who has been using marijuana?
A. Yes
B. No
30. During your life, have you ever been asked to use cocaine, including powder, crack, or freebase?
A. Yes
B. No
31. During the last 12 months, has any of your closest friends sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?
A. Yes
B. No
C. No answer
32. How do you describe your weight?
A. Slightly underweight
B. Very underweight
C. About the right weight
D. Slightly overweight
E. Very overweight
33. Which of the following are you trying to do about your weight?
A. Lose weight
B. Gain weight
C. Stay the same weight
D. I am not trying to do anything about my weight
34. During the past 30 days, did you exercise to lose weight or to keep from gaining weight?
A. Yes
B. No
35. During the past 30 days, did you eat less food, fewer calories, or foods low in fat to lose weight or to keep from gaining weight?
A. Yes
B. No
36. During the past 30 days, did you go without eating for 24 hours or more to lose weight or to keep from gaining weight?
A. Yes
B. No
37. How many of the past 7 days did you eat breakfast?
A. Never
B.days
38. During the past 7 days, how many times did you eat at a fast food restaurant?
A. Never
B. times
39. During the past 7 days, how many times did you eat fruit?
A. I did not eat fruit during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times or more per day

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40. During the past 7 days, how many times did you eat green salad?
A. I did not eat green salad during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times or more per day
41. During the past 7 days, how many times did you drink soft drinks such as Coke, Pepsi, or Sprite?
A. I did not drink soft drink during the past 7 days
B. 1 to 3 times during the past 7 days
C. 4 to 6 times during the past 7 days
D. 1 time per day
E. 2 times per day
F. 3 times or more per day
42. During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day?
A. None
B. days
43. On how many of the past 7 days did you exercise or participate in physical activity for at least 20 minutes that made you sweat and breathe hard, such as football, running, swimming, or similar aerobic activities?
A. None
B. day
44. On how many of the past 7 days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weight lifting?
A. None
B. days
45. On an average school day, how many hours do you watch TV?
A. I do not watch TV on an average school day
B. 1 hour or less per day
C. 2 hour per day or less
D. 3 hours per day
E. 4 hours per day
F. 5 hours or more per day
46. On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work? (Include activities such as Nintendo, Game Boy, Play Station, computer games, and the Internet.)
A. I do not play video or computer games or use a computer for something that is not school work
B. 1 hour per day
C. 2 hour per day
D. 3 hours per day
E. 4 hours per day
F. 5 hours or more per day
47. Have you ever been taught about AIDS or HIV infection in school?
A. Yes
B. No
C. Not sure
48. Have you ever been taught about Hepatitis (A, B, C, or D)?
A. Yes
B. No
C. Not sure
49. Have you ever been tested for a sexually transmitted disease (STD) including HIV, the virus that causes AIDS?
A. Yes
B. No
C. Not sure
50. During your life, did you receive information about sexually transmitted diseases?
A. Yes
B. No
C. No sure
51. Which of the following activities have you done:
 - Scuba diving
 - Auto racing
 - Motorcycle racing
 - Thrill-seeking
 - Doing martial arts
 - None of these activities
52. To what extent do you consider yourself to be a risk-taker?
- | Low | | | | | Moderate | | | | | High |
|-----|---|---|---|---|----------|---|---|---|----|------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
53. What is your gender:
 - Male
 - female
- This is the end of the survey.
Thank you very much for your help**