ASSESSMENT OF ANONYMOUS HIV AND STI-RELATED SEXUAL RISK BEHAVIOURS AND SUBSTANCE USE AMONG IRANIAN UNIVERSITY STUDENTS IN TEHRAN

by

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ABSTRACT

Background: In recent years, a wide range of epidemiological studies have identified high levels of risky behaviours among young people in several developing countries. Knowledge among high school and university students about HIV/STI and the need to be protected from unsafe sex is very low in these countries. There is evidence that sexual activity, particularly unprotected sexual penetration among the young population, is increasing. Iran is in the midst of an HIV and STI epidemic concentrated among the most at risk populations. The university student population is the largest group of young people in Iran. It has been acknowledged that, increasingly, young people in Iran are engaging in high-risk behaviours for STI and HIV infections. Therefore, university students were selected as the target group for our investigation.

Objective: To assess the range of HIV and STI risk related behaviours and substance use in students at universities in Tehran, Iran.

Methods: This dissertation employed a mixed methods strategy to study Iranian university students. The mixed methods comprised both quantitative and qualitative inquiries to collect data. For the quantitative method, an anonymous quantitative survey was conducted using a self-administrated questionnaire. In this part, respondents were selected from students studying at universities in Tehran. In the qualitative part, thirteen experts with first-hand knowledge of how young people at university behaved were invited to participate in face-to-face semi-structured interviews. The semi-structured interviews were broadly guided by the key questions that included: their viewpoints about estimating the prevalence of illicit drug use, different types of illicit drug use, high-risk sexual behaviours, unsafe sex or

unprotected sex, estimating the prevalence of STIs, multi-partnerships and other highly sexual behaviours among university students in Tehran, Iran.

Results: Out of 400 students who were invited to the study, 392 (98%) students responded to the questionnaires. The mean age of the participants was 21.98 (range 18-35). A total of 230 (58.7%) were males and 162 (41.3%) were females. Fifty-eight (14.8%) participants had experience of drug use at least once in their lifetimes. The three most commonly used substances were grass 43 (11%), hallucinogens and stimulants 27(6.9%) and cocaine 10 (2.6%). Moreover, 144 (36.7%) of participants had sex within the last 12 months and had experience of sexual behaviours within the past twelve months, of which 103 (26.3%) reported having unsafe sex and 63 (44.1%) reported having had more than one sexual partner. In addition, 17(4.3%) of participants reported having had an STI in the past 12 months. Compared to females, more males had used condoms in their last sexual contact ($P<0.005$, CI 95%) and more male students had multiple sexual partners compared to female students ($P<0.005$, CI 95%). Furthermore, 34 (8.7%) of the students surveyed had sex with sex workers (male students) or a person with a multi-partnership background (female students). Twenty (5.1%) participants had been in a group-sex session at least once in the last 12 months.

All the experts believed that the prevalence of high-risk sexual behaviours had increased among students, and almost all mentioned that students were unwilling to use condoms. There were different opinions about the prevalence of STIs and, especially, HIV among university students, but nearly all participants were still concerned that the risk of spreading these diseases among students was the same in this population as in the general Iranian population. Almost all participants expressed that there were other high-risk sexual behaviours among university

students including: multi-partnerships, sex with commercial sex-workers, homosexuality and bisexuality, and engaging in group-sex. In addition, it was common for male students to have several sexual partners at the same time. According to most participants, having sex with sex workers was becoming very popular among male students. A large number of participants had several clients who had been in a group-sex session or had exchanged their partners with their friends at least once. All participants believed that drug use was common, especially among male university students. The three most commonly-used substances mentioned were cannabis, amphetamine and opium.

Conclusions: High-risk behaviours, including unprotected sex, having sex with multiple partners and using illicit substances, were on the rise in university students in Iran. The current study has uncovered a critical situation of HIV and STI infections that may occur among young university students in the near future; therefore, public health strategies needed be developed to prevent a significant emergence of HIV and STIs among university students. These findings have policy and practice implications for the prevention of STIs, including HIV, and the protection of young people in Iran and in other similar settings.

CERTIFICATION OF ORIGINALLY

I certify that this thesis was conducted independently and reports original work by me during my university research programme. Due acknowledgement has been made throughout where work from other parties has been used directly and indirectly. This work has not been submitted previously, in whole or in part, to qualify for any other academic award.

Signature:……..

Date:……..

ACKNOWLEDGEMENTS

It is now, finally, time to write this note of thanks as the final task of my thesis. It has been a period of concentrated learning for me, not only in my scientific area, but also in my personal life. Writing this thesis and engaging in this programme will have a huge impact on my future career.

I would like to reflect on the individuals who have supported and helped me so much throughout this period.

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ACRONYMS and DEFINITIONS of KEY TERMS

There are number of key terms that will appear throughout this discussion and, for clarity, it is necessary to define these here. This will facilitate the emerging understanding of high-risk sexual behaviours related to STI, HIV and substance use.

STI: Sexually Transmitted Infections

HIV: Human Immune Deficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

Multi-partnership: Having more than one sexual partner at the same time

Concurrent sexual partnerships: Overlapping sexual relationships with more than one person at the same time

Homosexuality: Romantically or sexually attracted to people of their own gender

Bisexuality: Sexual attraction or sexual behaviour toward both males and females

Group sex: A sexual activity that involves at least three people at the same time; this can include straight, bisexual and homosexual groups

Threesome: Sexual activity that involves three people at the same time

CHAPTER ONE

1. INTRODUCTION

1.1 Iran

Iran, also called Persia, and officially known as the Islamic Republic of Iran, is located between Iraq and Pakistan and its neighbours on the Gulf of Oman, the Persian Gulf and the Caspian Sea. (Figure 1-1) (1) It is located in the Middle East and Its neighbour in the north is Russia, in the north-west Azerbaijan, in the north-east Turkmenistan, in the east Afghanistan and Pakistan, in the west Turkey and Iraq, and in the south the Persian Gulf and the Gulf of Oman, as shown in Figure 1-2, below.

Iran is the second largest country in the Middle East (1,648,195 km^2) and the 17^{th} most populated country in the world, with 78.4 million citizens. (2) Iran is located in Eurasia and Western Asia and alongside the Strait of Hormuz and has both Caspian Sea and Indian Ocean coastlines. The country is also located in Middle East and North Africa (MENA) region. The population of the MENA region is about 381 million and about 6% of the total world's population live in this region. The MENA region extends from Morocco in the west to Afghanistan and Pakistan in the east, as shown in Figure 1-3, below. (3, 4)

Figure 1-1 Geography of Iran

Figure 1-2 Iran in the Middle East region and its neighbours

Figure 1-3 The MENA region extends from Morocco in the west to Afghanistan and Pakistan in the east

The climate range in Iran varies from arid and semi-arid, to subtropical along the northern forests and the Caspian coast in the north. (5) Administratively, Iran is divided into five regions with 31 provinces. The provinces are divided into counties that are further sub-divided into districts and sub-districts. (6)

Iran is a large industrial nation in the Middle East with a wide range of manufacturing: construction materials, transportation, food and agricultural goods, home appliances, pharmaceuticals, power and petrochemicals, and information technology. (7)

The official language of the country is Persian (Farsi), which is spoken across the country. Other Iranian languages include: Azeri, spoken mostly in the northwest; Kurdish, spoken largely in the west; Arabic, spoken mainly in the Persian Gulf coastal regions; Balochi, spoken mostly in the east; and Turkmen, spoken mainly in the northern border regions. (1)

1.1.1 Population

Iran has one of the highest urban growth rates in the world. The urban proportion of the population increased from 27% to 60% (from 1950 to 2002) (6) The population of Iran has grown quickly during the last half of the 20th century, increasing from 19 million, in 1956, to 75 million by 2009. (8, 9) Iran is a young country with around 60% of its citizens below the age of 35. (10)

Iran hosts more than one million refugees, mostly from Iraq and Afghanistan. Moreover, nearly five million Iranian citizens have immigrated to other countries, mainly in 1979 after the Iranian Revolution. (11) The government is required to provide every inhabitant of the country with social security that covers unemployment, retirement, accidents, disability, health and medical treatment, care services and during old age. (12)

1.1.2 Culture

The Iranian culture was among the first civilisations in the world and has about 2000 years of recorded history. It holds an extraordinarily stable and complex culture that had little influence from the outside world over the ages. Nevertheless, Iran had extensive contacts with many other populations in the course of the numerous civilisations and empires based in Iran. Iran's dominant geopolitical position and culture has directly influenced cultures and peoples as far as Russia to the north, Greece, Macedonia and Italy to the west, East Asia to the east and the Arabian Peninsula to the south. This has had an immeasurable influence on

Iranian culture after Islam came to Iran. Today, 98% of Muslims live in Iran. (1)

1.2 Tehran

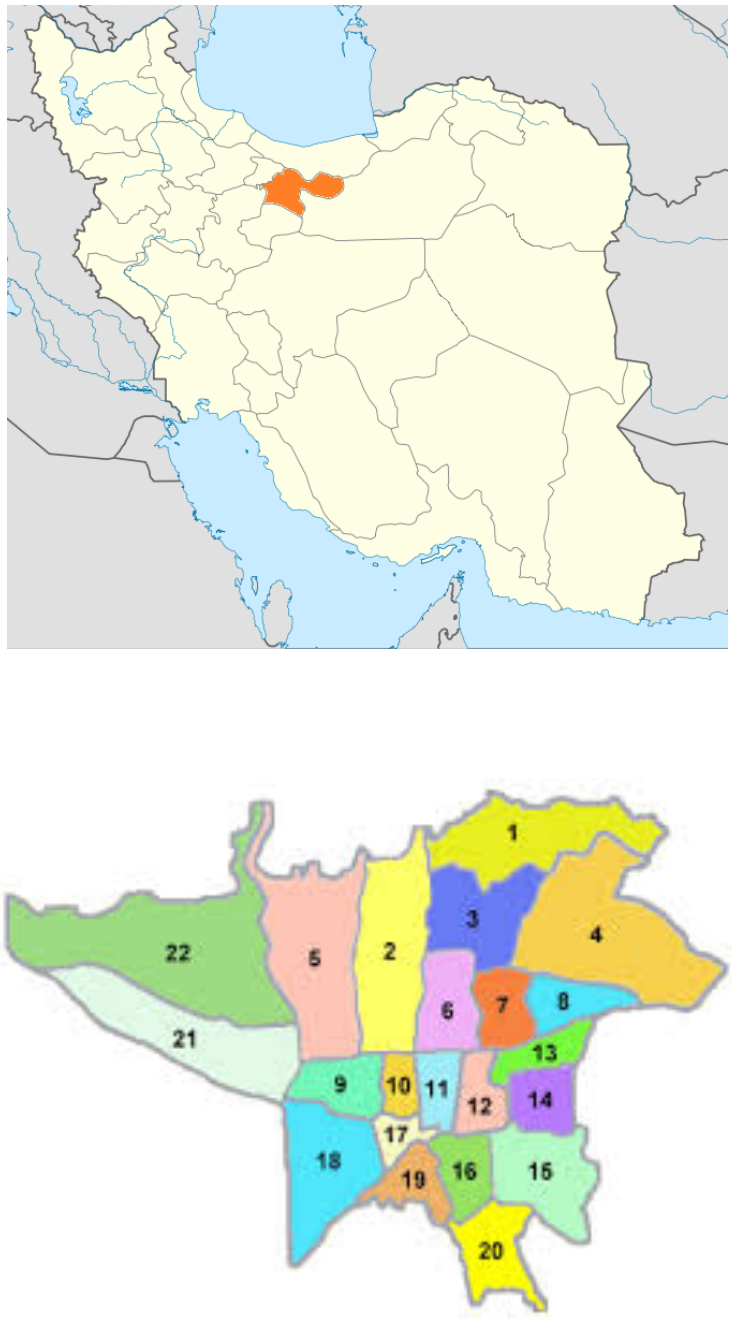

Figure 1-4 Tehran Province and its twenty-two separate suburbs or sub-sections

Tehran is the capital of Iran. Over the history of Iran, the capital city has been relocated several times, and Tehran is the 32nd national capital of Iran. It has a population of 8,429,807 and exceeds 12 million in the wider metropolitan territory. Tehran is the largest city in western Asia and the 19th largest city in the world. Tehran is, likewise, Iran's largest urban zone and city. It is separated into 22 differentiated suburbs, as shown in Figure 1-4 above.

Tehran is the hub of the transport network and communication in Iran. It is also known as the industrial, commercial and cultural centre of the country. Furthermore, it has been hosting populations for over two thousand years. (13) Tehran is home to diverse ethnic and linguistic groups from across Iran. The native language of this city is Tehrani, which is a dialect of Persian. (14)

Tehran has changed very considerably in its ethno-social configuration in the 1980s. Because of the social, economic and political consequences of the revolution that happened in 1979, some Iranian inhabitants left Iran, and most moved to the United States, Germany, France, Sweden and, more recently, to Canada and Australia.

Although Tehran is not Iran, most people believe that Tehran is the mirror of Iran. Tehran is a centre in which over 40% of the country's economic activities take place. Those who live in this young city have come from around the country bringing with them their various languages, lifestyles and cultures to inhabit this national and international city together. Notably, modern societies take form in large cities, thus, in the near future Iran is being formed in Tehran. Tehran is the home of academies, such

as, universities, several religious schools and major conferences. Moreover, all governmental organisations and the health system organisations are located in Tehran. (15)

1.3 Higher education system in Iran

Iran has many public and private universities that offer degrees in higher education. Universities in Iran are under the direct supervision of Iran's Ministry of Science, Research and Technology (for non-medical universities) and the Ministry of Health and Medical Education (for medical schools).

Iran has over 54 public universities and 3.5 million university students. Public universities are the top choice for students in the national entrance exams. In all schools, except for private universities, such as the Islamic Azad University system, tuition fees are mostly paid for by the government. The prerequisite to enter into higher education is to have a high school diploma and to have passed the national university entrance examination (Iranian University Entrance Exam). In addition, Tehran is the largest and most important educational centre of Iran; it attracts not only the students in Tehran but also most of the students from other cities in Iran. The most prestigious universities and educational institutions are located in separate regions in Tehran and include: the University of Art; the University of Economics; the University of Nursing and Midwifery; the University of Engineering; the University of Humanities; the University of Mathematics, and the Engineering and University of Medicine.(16)

1.4 Health system in Iran

In 2000, the World Health Organisation (WHO) reported that Iran ranked 58th in national health metrics and 93rd in the performance of its healthcare system. In 2013, Bloomberg ranked Iran as the 45th most efficient health care system ahead of the United States and Brazil.

A new health care system in Iran was established in 1984 to provide for basic health needs throughout Iran. The guidelines of Primary Health Care (PHC) in Iran make health care services accessible to all citizens and harmonises the quantity of health services to reduce expenses in these services as well as being a referral system for health care in Iran. Currently, under Primary Health Care (PHC) supervision, the first level of health services is Health Houses in villages and Health Posts in urban areas. The second level of health services is Urban and Rural Health Centres in cities and villages. Moreover, in the case of any essential need for specialised health services, patients will be referred to specialist hospitals or clinics, which provide the third and fourth levels of the health service. The Health Care System pathway in Tehran is depicted in Figures 1-5, 1-6 and 1-7, below. The other provinces in Iran follow the same pathway.

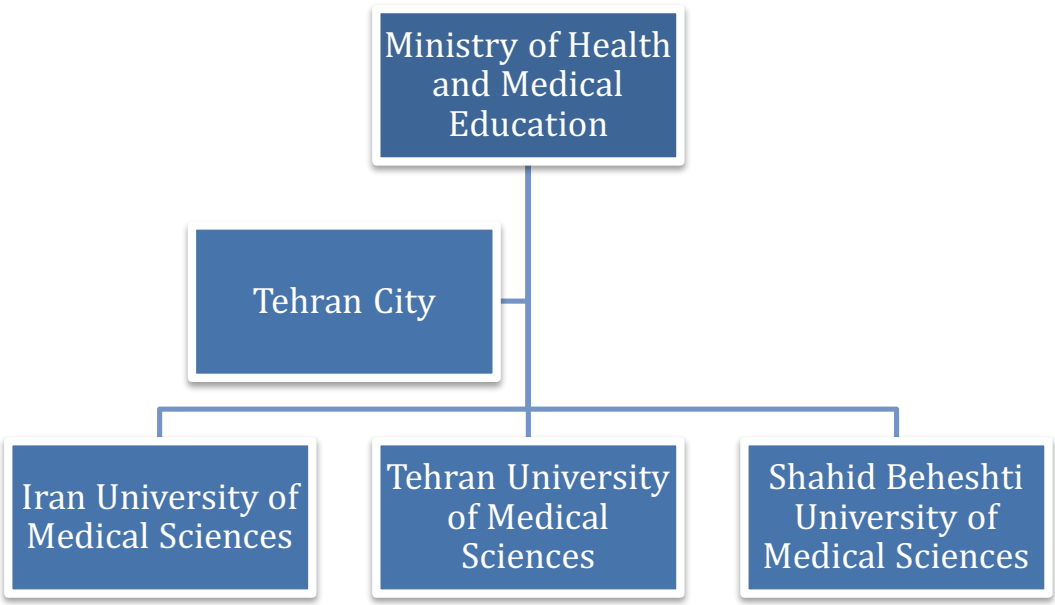

Figure 1-5 Medical Universities under the supervision of Ministry of Health and Medical Education in Tehran

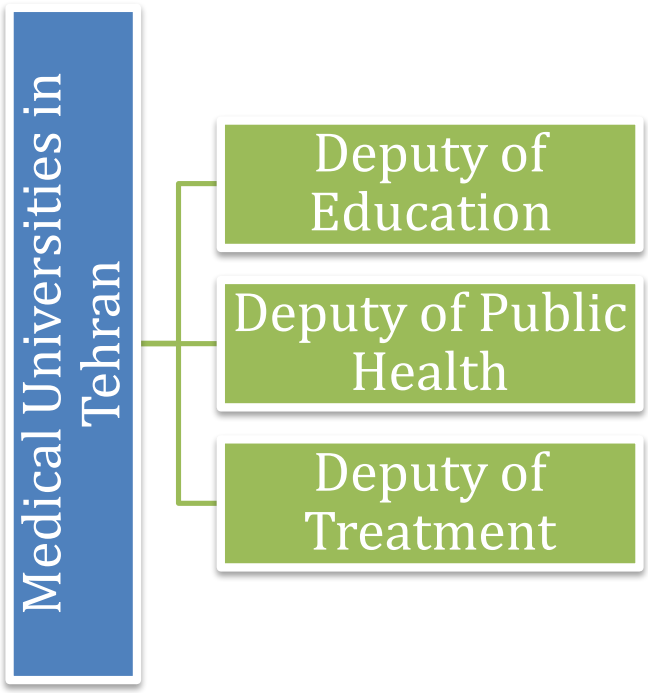

Figure 1-6 Medical University sub-sections in Tehran

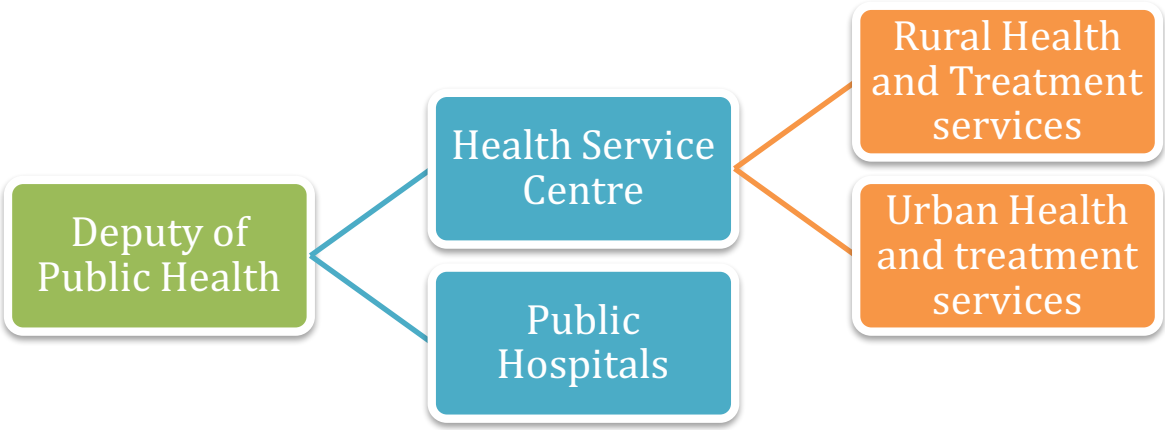

Figure 1-7 Deputy of Public Health sub-sections in Tehran Province

The healthcare system is funded on three separate bases, including: the public-governmental system, the private sector, and through NGOs.

In addition, $346 per capita is spent on healthcare in Iran, where life expectancy is 73 years. Total healthcare spending was increased from $24.3 billion, in 2008, to $50 billion, in 2013, because of the increasing demand on medical services. (17)

The Iranian healthcare system is highly centralised. The Ministry of Health and Medical Education (MOHME), which is the major organisation of the health system, is the predominant health policy maker. MOHME is responsible for the provision of medical insurance, healthcare services, supervision and instruction in the healthcare system and also medical education throughout the country. (Figure 1-8, below.)

Figure 1-8 Health care units in the Ministry of Health and Medical Education in Iran

In addition, there is the Medical Services Insurance Organisations (MSIO) that was established to act as an insurance firm and a relief foundation. (12) The health situation of people living in Iran has improved over the last two decades. Iran is able to extend public health preventive services through the establishment of an extensive Primary Health Care Network. The ongoing epidemiological transition will have a significant effect on the pattern of mortality and morbidity in the near future in Iran, particularly as it affects chronic non-communicable diseases and problems in the aged care system. (18)

1.5 HIV/AIDS and illicit drugs in Iran

There is a national HIV health care treatment system, including 150 testing sites and also a free needle exchange programme. Furthermore, since 2005, the excellent research centre for HIV/ADIS, named the Iranian Research Centre for HIV/AIDS (IRCHA) has been established in Tehran, under the direct supervision of the Health and Medical Education ministry, and is located in Imam Khomeini Hospital.(19) Undoubtedly, AIDS is currently increasing at a rapid rate in the country. The major mode of transmission so far has been in injected drug use, while there has been a rise in sexual transmission of the disease in recent years. In 2014, 88.4 precent of the HIV patients were males and 11.6 percent of the infected population were females. (20)

In contrast, with 2.8% of addicted people, Iran is ranked first worldwide in the prevalence of opium addiction, worse than that, the initiation age for most Iranian addicts is estimated to be in their 20s. Therefore, substance

addiction is a major health problem in Iran, since Iran is placed along one of the main trafficking routes for illicit drugs, such as cannabis, heroin, opium and morphine, which are produced in Afghanistan; these contraband substances are then exported to Iran illegally. (21) (22) In the last decade, ease of access to illicit drugs has become one of the huge issues among the young population in Iran. (23) (24)

1.6 Researcher's background

I have completed a Master of Public health (MPH) as well as a Doctor of Medicine (MD) qualifications in Tehran universities. Studying medicine at doctorate level provided me with a comprehensive understanding of medicine. Following graduation from medical school I was employed as a public heath researcher by the Iranian Research Centre for HIV/AIDS (IRCHA). IRCHA is the national research centre for the provision of scientific evidence about HIV infected patients to healthcare providers and policy-makers. During my time at IRCHA I worked on several quantitative and qualitative research projects, and this allowed me to improve my skills in epidemiology and public health. My duties were to guide the development of research proposals, carry out research projects, conduct statistical analyses, contribute to writing or reviewing reports and manuscripts, and to submit papers to journals. My area of focus was the health care in HIV infected people. This work produced more than 20 publications in national and international journals. During this time I developed skills and knowledge in the development of health policies, health management, planning, and the development of health services, health education and promotion. My clinical experience in medicine and

health research in IRCHA gave me an understanding of the complexities involved in providing an equitable health service, developing robust public health solutions and an awareness of context in the healthcare needs of patients and their families.

Working at IRCHA has led me to develop an interest in studying public health, as it would introduce me to new approaches to methods of epidemiology. I successfully completed a Master of Public Health and submitted my thesis project entitled: *Surveillance of HIV Infection among Students in Tehran University of Medical Sciences* (Honours), the outcome of which was published in the American Journal of Epidemiology and Infectious Disease. My masters further improved my public health knowledge in a range of public health areas, including epidemiology and biostatistics, and quantitative and qualitative research methodologies.

To enhance my knowledge and attitudes towards public health I chose Australia to continue my research, particularly in the area of high risk behaviours related to HIV and STIs. These are a huge issue in many countries, and I was looking for the answers to the many questions that had arisen from my previous research.

1.7 Research background

HIV, as well as STIs, are on the rise in Iran due to increasing high risk sexual behaviours and the most high risk group is young people.

The Iranian population is young, as in other developing countries. In 2012, more than half of Iran's population was under 35 years of age. After some changes in family planning policies between 1976 and 1986, the population of young Iranians has been increasing considerably over

recent years. Therefore, the result of that policy turned Iran into one of the youngest populations in the world. (10)

In the young stages of life, important behavioural patterns are formed that will affect the whole life of a person. Substance consumption, inappropriate and illegitimate sexual behaviours begin from this stage. (25-27) Youth is regularly identified as a stage of increased imitation and exploration with a range of risky behaviours, including risky sexual behaviours and illicit substance use. (28-32) Hence, the Iranian people are experiencing growth in the incidences of high risk behaviours, which will be the reason for the increases in HIV and STI, as in other young countries. (33)

Most young Iranian individuals go to universities after finishing high school, making university students the largest group of young people in Iran, so that is why university students were selected as the target group for this investigation.(34)

It has been difficult to establish a thorough overview and understanding of sexual behaviours, as well as sexual health, among university students since the media, and the government, in Iran have always censored sex. In addition, many KAP studies (Knowledge, Attitude and Practice) in HIV/AIDS have revealed that there was a lack of knowledge among this population about high risk behaviours related to HIV and STI, which confirms the significance of this project. (40, 41)

According to the Iran Ministry of Health report to UNAIDS in 2008, the rate of having sexual experience among male Iranian teenagers between15 to 19 years old with more than one partner in the past 12 months was 10.7%

and for females it was 1.3% This report showed that having a first sexual experience before age 18 in males was 17.1% and in females, it was 4.3%. (35) Noticeably, Iran is a country with very restricted rules especially for unofficial sexual relationships, which are called unauthorised relationships. These restrictions make discussions about sex a taboo; therefore, there are no official sexual education programmes in Iran. Most teenage individuals learn sex from their peers or from watching porn movies, so they receive in accurate information. (36) In addition, unofficial sexual activity is on the rise in Iran. (35, 37) A shocking report in 2006 estimated that among Iranian high school students 74.3% of boys and girls had had an unofficial sexual relationship; 80% of female high school students in Tehran had at least one sexual engagement, while 40% of students in Tehran had started sexual activity by 14 years of age or earlier. (38)

Over the last decade the features of sexual activities have been changing among Iranian young people. There are informal reports of increasing trends of substance use and sexually risky behaviours among university students, especially those studying in highly populated cities. However, there are few studies in this regard that explore the problem in detail. (37)

The pattern of substance use has changed in Iran since the 1990s. Iranian young people today use cannabis (hashish, marijuana), crystal meth and ecstasy, which have affected sexual behaviours seriously in a way that was unlikely in the past when they mostly used drugs like opium and heroin, which suppressed sexual activity. (39) Nevertheless, the only publications about sexual problems, sexual behaviours or other risky

behaviours in Iran are reports in the Iranian language (Farsi), and there are few to be found in international publications in English. This means there is still much undiscovered information in this area and only a few systematic studies of high risk behaviours among young adults have been carried out so far. Moreover, because of the highly risky nature of unsafe sex and substance use, surveys of these behaviours are extremely challenging. Therefore, we employed a mixed method approach to assess the HIV and STI risk situation among university students to develop methodologies for behavioural research.

This thesis comprises seven chapters, the current chapter, the first, summarised general information about the Iranian population, culture, education and health system, plus the backgrounds of the researcher and the research. It will then present the specific research questions investigated to explore this topic in greater detail. The answers to these questions will contribute to a more insightful perspective on the epidemiology of high-risk behaviours and substance use in university students in Tehran that should be taken into account in future research initiatives. This chapter begins by outlining the pertinent research questions that need to be investigated when exploring risky behaviours related to HIV and STIs.

Following this chapter, Chapter 2, presents a comprehensive literature review on illicit drug use and sexually high-risk behaviours, such as having unsafe sex, particularly in students, and will reveal why university students were selected as the primary focus for this research.

Chapter 3 summarises the epistemology and methodological approaches that were adopted in this research study.

Chapter 4 presents comprehensive findings from a quantitative study, which yields the frequency of substance use and sexually risky behaviours that can perpetuate the risk of HIV and sexually transmitted infections.

Chapter 5 presents the findings from the qualitative study that can inform the opinion and attitudes of experts in the area of risky behaviours about the increasing HIV and STI among university students in Tehran.

Chapter 6 has a general discussion highlighting the important data from both the quantitative and qualitative findings and compares those outcomes with the literature.

Chapter 7 discusses the limitations of the study and also provides detailed conclusions that give underlying information about the prevalence of high risk behaviours and substance use among university students and provides specific recommendations about how to control the risk of becoming infected by HIV or an STI among students.

In summary, the objective of this research project was to elucidate the high-risk behaviours related to HIV and STI. Through a detailed literature review, this investigation sheds light on risky behavioural factors (sexual behaviours or substance use) that perpetuate HIV and STI transmission among this population. Through a mixed methods study, that includes a quantitative (cross-sectional survey) and a qualitative study, this research sought to answer a number of questions and test some hypotheses

surrounding the behavioural factors that put this group at greater risk of HIV and sexually transmitted infections.

It is clear that for university students, as a sample of a young population in Iran, and in understanding their extremely risky behaviours related to HIV, STI and illicit drug use, that the findings from this study yielded informative data. This data may better inform policymakers, health care professionals and researchers in designing and implementing sexual health policies for young Iranian people. In this way, policymakers, researchers and political organisations can come together and design effective prevention strategies and interventions.

While research cannot, on its own, put an end to the high-risk behaviours and illicit substance use that is epidemic among university students, it can help shed light on the epidemiological factors that may put individuals at even greater risk of becoming HIV/STI infected.

1.8 Research aims and critical research questions

Aim 1: To identify patterns of risky sexual behaviours among university students in Tehran.

The critical question associated with the objective of this study's aim is the following:

What is the estimated prevalence of risky sexual behaviours among university students in Tehran?

Aim 2: To identify the prevalence of STI-related behaviours among university students in Tehran.

The critical question associated with the objective of this study's aim is the following:

What is the estimated prevalence of STI-related sexual behaviours among university students in Tehran?

Aim 3: To explore and estimate the prevalence of multi-partnerships or other high-risk sexual behaviours in university students in Tehran

The critical question associated with the objective of this study's aim is the following:

What is the estimated prevalence of multi-partnerships or other high-risk sexual behaviours among university students in Tehran?

Aim 4: To identify patterns of illicit drug use among university students in Tehran

The critical question associated with the objective of this study's aim is the following:

What is the estimated prevalence of substance use related risk behaviours among university students in Tehran?

Aim 5: To explore various types of illicit drug use among university students in Tehran

The critical question associated with the objective of this study's aim is the following:

What is the estimated prevalence of various types of illicit drug use among university students in Tehran?

1.9 Research objectives

- To assess the range of HIV and STI risk-related behaviours in students at universities in Tehran
- To identify the estimated prevalence of STI among students at universities in Tehran
- To identify patterns of risky sexual behaviours among students at universities in Tehran

  To identify patterns of illicit drug use among students at universities in Tehran

1.10 Study hypotheses

1- The prevalence of HIV and STI-related risk behaviours in university students is increasing

2- The prevalence of STI in university students is increasing

3- The prevalence of substance use in university students is increasing

1.11 Conclusions

This chapter outlined the research aims and the main research questions to be addressed in the current study. The researcher's background and a brief viewpoint of the research context were also provided in this chapter. By highlighting the main questions of the study, it was possible to formulate a number of hypotheses surrounding the potential associations between university students and how they contributed to the overall risk of HIV, and STI-related high risk behaviours and substance use. In this chapter, the statement of the problem and the purpose of the problem

were clarified. From this standpoint, the general research plan was presented, with the ultimate aim of discussing the avenues through which the findings of the present study will set the foundations for future research.

The next chapter will describe in detail the literature related to the main questions of the present study, or those that were similar to the methods of this study. The method of the search, including the search strategy and data evaluation and the selection of the literature, will then be explained. The literature review categorises the documents by subject and area of study. The main focus of the literature review will be on studies that have been carried out among Iranian young and students so far.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

Tehran is a highly populated city, a city of activities, parties, attractions and civilisations; that is why it is the youngest city of Iran. The main, and highly-ranked, universities are also located in Tehran; therefore, most students in Tehran and other provinces compete to enter the universities there after graduation from high schools. In addition, Tehran university students make up a relatively large proportion of the total population of youth in Iran and universities in Tehran contain large numbers of young students with a range of cultures and habits.

As discussed in the previous chapter, sexually transmitted infections (STIs), including HIV, are on the rise in Iran. Moreover, the prevalence of HIV/STI is clearly related to highly risky behaviours (sexual behaviours or consumption of substances to increase sexual activities).

The current chapter first presents the methods of the literature review and then a literature review that explores the prevalence of HIV and STI, sexually risky behaviours and substance use among young populations, specifically, students studying in developing countries like Iran. In addition, it includes the factors associated with the rise of HIV, as well as STIs, in Iran.

In gaining an in depth understanding of high-risk behaviours and substance use among university students in Tehran, the review first focuses on the situation of HIV/STI and high risk behaviours related to

these infections in other countries, especially in the Middle East region, to provide a comprehensive backdrop of the context embedded in Iran. The conversation then shifts to risky behavioural situations in young people, particularly students in Iran, as the focus of the study and elaborates on the prevalence of the current epidemic of HIV/STI and substance use in this country.

2.2 Methods of the literature review

2.2.1 Search strategy

A traditional, or narrative, literature review was conducted in this present study to provide a comprehensive background for understanding our current knowledge and highlighting the significance of the present investigation. This literature review strategy supports the research ideas by identifying gaps or inconsistencies in the body of knowledge; therefore, it can define or determine research questions or hypotheses comprehensively. In addition, this literature review strategy can be helpful in developing the conceptual or theoretical frameworks. In addition, traditional or narrative literature reviews continue to offer a valid and important way to identify existing patterns and gaps in social work research. In fact, because they draw not only on quantitative but also qualitative studies their reach may often be broader. (40) The literature review process is shown in Figure 2-1, below.

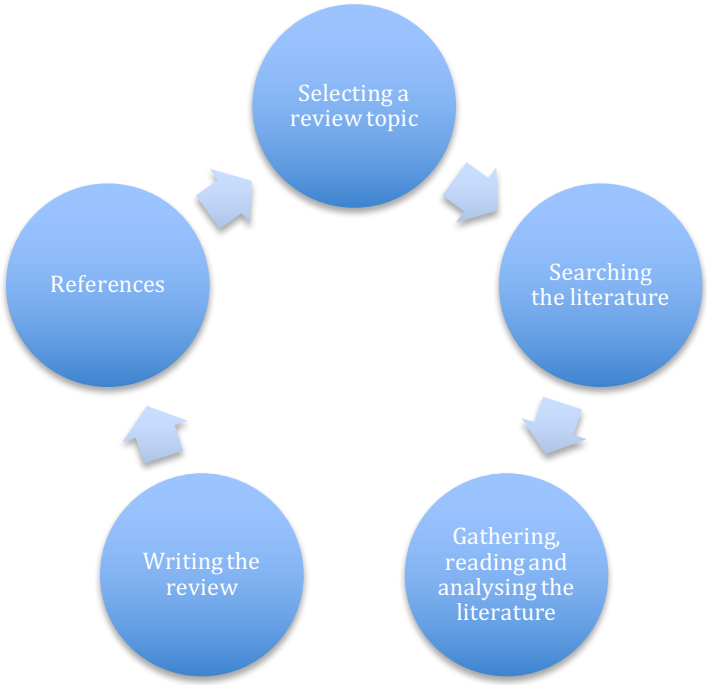

Figure 2-1 Literature review process diagram

2.2.2 Databases, keywords and terms

Original studies investigating HIV/STI prevalence, illegal substance use and high-risk sexual behaviours related to HIV/STI among university students in Tehran, were identified by searching electronic databases and reports. The databases included: PubMed, MEDLINE and Google Scholar, which were deemed to be most appropriate and comprehensive in their scope. Each of the articles or reports was applied according to the main problem, methods and analysis of the study.

The following medical subject heading (MESH) terms were used for PubMed, while the same terms were used as keywords in the other database searches conducted: HIV AND (high-risk sexual behaviours) [TI]

OR (Sexually transmitted Infections) [TI] OR (Substance use) [TI] AND (Students) [TI].

Additional studies were also identified through cross-referencing the bibliographies of the retrieved articles and making contact with the primary authors as well as other researchers in Iran. Moreover, some Farsi (Iranian language) keywords were also used in Google and Google Scholar for searching Iranian publications.

Selection criteria (inclusion and exclusion criteria):

Inclusion criteria for this review thematic analysis of literature comprised the following: studies on HIV and STI prevalence that focussed on high-risk sexual behaviours; illicit substance use data from among young populations, specifically, university students; and publication in a peer-reviewed journal; or an abstract at a conference. Grey literature was identified and included, such as annual reports in Iran of the prevalence of HIV infected patients if the studies were not published in peer-reviewed journals, although studies commissioned by the Government of Iran were included. Exclusion criteria were repeated original articles and their abstracts, which were omitted.

2.2.3 Data evaluation and selection

The initial search strategy yielded a total of 188 publications. To improve the quality of data selection, some experts in public health and specialists in the area of HIV/STI and substance use, were consulted.

Several publications in peer-reviewed journals, abstracts at conferences some reports from health organisations, such as WHO (World Health

Organisation), UNAIDS (United Nations programme on HIV/AIDS) and the Ministry of Health and Medical Education in Iran, were reviewed. One hundred and forty-six reviewed papers were subsequently reduced, through a number of stages, to 106 papers, using the criteria outlined above. (Figure 2-2, below)

Most publications contained a summary or abstract, which assisted with deciding whether it was worthy of further reading or inclusion. For all studies in this review, the following descriptive and substantive data were extracted from original publications:

1) First author and year of publication
2) Study place
3) Study period
4) Sampling methods
5) Sample of size and age of participants
6) Methodology of the study
7) Reported sexual risk behaviours and substance use
8) Outcome measures

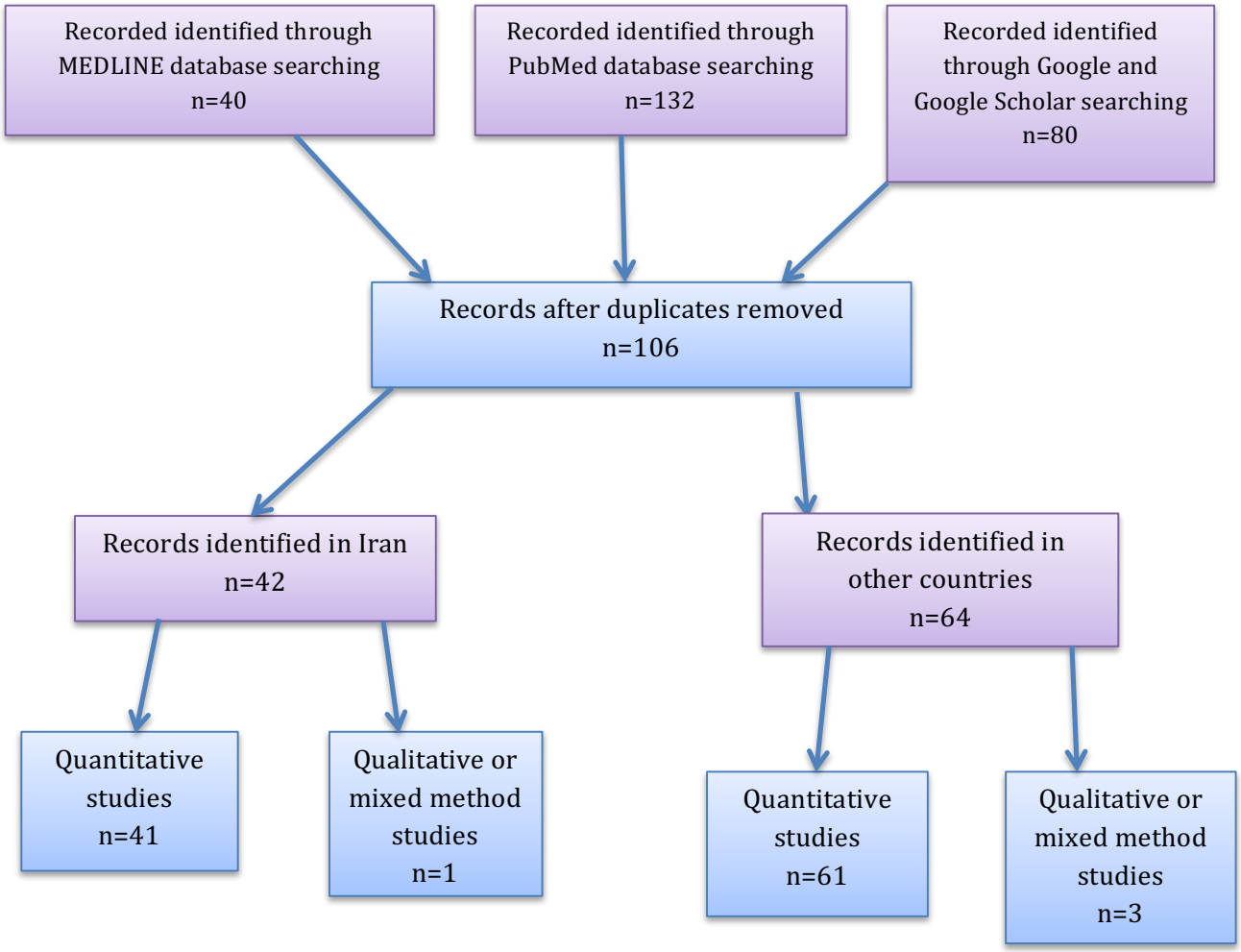

Figure 2-2 Literature search flow diagram

2.2.4 Analysing and synthesising the literature

The literature review of original studies included the prevalence of HIV infections and STIs, high-risk sexual behaviours and illicit substance use in different nations and communities. It focused on the epidemiology of high-risk behaviours and addressed gaps in the existing knowledge about HIV/STI and protected sex. These data were considered official and were often cited in peer reviewed publications, conference papers and reports to UNAIDS, WHO and the Iran Ministry of Health and Medical Education, and included studies carried out by non-governmental organisations or published in the press/media. After an analysis of the literature review, a

thematic analysis of the literature was conducted based on the overview. The papers were categorised into two different sub-topics that included: place of study (developed countries or developing countries, including Iran), and the types of high-risk behaviours (sexual or substance use).

Exploration of high-risk behaviours, especially sexually risky behaviours among university students, remain understudied in Iran, and substance use as a risky behaviour related to STI and HIV has not been comprehensively studied in Iranian university students. Therefore, this rendered the design and implementation of effective HIV/STI prevention for this population is challenging.

Bridging this gap can help in comprehending the important challenges in the care of university students' behaviours related to STIs and HIV infections to provide a novel health care programme for high-risk behaviours among university students.

The literature review started by investigating some developed countries in which the methodology of the studies was similar to the present study. This was followed by a review of similar studies that had been conducted among students in countries with similar socio-economic backgrounds as Iran, such as Ethiopia and China.

2.2.5 HIV/STI situation in the world's population

HIV is a serious infectious disease and a chronic condition with no cure. All nations and communities across the world, particularly in low and middle-income countries, are significantly affected by an HIV pandemic. (41, 42) There were approximately 35 million HIV/AIDS cases in the world in 2013. At that time, 39 million people across the world have died of AIDS. The vast majority of people living with HIV are in low and middle-income countries. UNAIDS reported that 19 million of the 35 million people living with HIV today do not know that they are carrying this virus. It is estimated that there are 130,000 AIDS cases in Eastern Europe and Middle Asia, and 32,000 cases in the Middle East and North Africa. Worldwide, the HIV epidemic is spreading at a rate of 2.1 million new infections per year. (39, 43-46)

The growth of HIV infections has been reported to be accelerating in certain regions of the world, including the Middle East and the North African (MENA) region. Currently, the MENA region is one of the regions where HIV is still on the rise. This region also comprises more than 10% of the population aged between 15 and 49. (41, 47, 48)

Iran is a large, highly populated country located in MENA. At present, the number of Iranians living with an HIV infection is about 2866. Unfortunately, some authorities in Iran believe that AIDS in Iran is going to result in a "time bomb" in the very near future. The Iran Health Ministry and Medical Education estimated that every three months 400 people are becoming contaminated with an HIV infection in Iran (20, 49), while

more than one million people acquire a sexually transmitted infection every day around the world. About 500 million people have become infected with at least one of the four STIs: chlamydia, syphilis, gonorrhoea and trichomoniasis. Moreover, nearly three million youths are infected with at least one sexually transmitted infection (STI) each year; this means 25% of sexually active adolescents become infected with one of the STIs every year. (43-46, 50) There is evidence that sexually transmitted infections (STI) and HIV are predominately contracted through unsafe sexual practices and can stay hidden and show no symptoms. Also, if these disease are left untreated, they can have serious long-term consequences and adverse effects. (51)

Unfortunately, so far there has no well-organised study carried out about sexually transmitted infections among young individuals in Iran. The only study conducted about the frequency of STIs among young population in Iran showed that the most prevalent STI pathogens in Tehran included candida, trichomonas, gonorrhoeae and chlamydia, with frequencies of 53.96%, 18.87%, 4.91% and 22.26% in females and 47.10%, 8.67%, 9.50% and 34.71% in males, respectively. (52)

Over the last decade, scattered epidemiological research has identified high levels of risky behaviours related to HIV/STI among young individuals in developing countries, with varying degrees of infections reported in study findings and conclusions across countries. Furthermore, knowledge about STIs and HIV is quite low in those countries particularly in high school and university students. In some cases the only source of sexual

information and sexual protection mentioned was porn movies and peers, which cannot be very reliable. (36, 45)

Despite that, the low to middle income countries bear the overwhelming burden of the HIV epidemic in terms of the numbers of their inhabitants living with this virus. Knowledge about them is rather inadequate and is often perceived as a ‘black hole’ in terms of HIV and AIDS information. (53)

As a glaring example, only half of the students in north west Ethiopia (a low to middle income country located in Africa) have been informed that AIDS is an incurable disease or that HIV infections can be acquired through sexual penetration. Moreover, only 25% of students obtained information about HIV/STI from their teachers, although education about unsafe sex at schools is one of the most important ways of preventing unsafe sexual activity among adolescents. (54) It is important to note that intervention programmes providing sex education among students have been reported to result in an improvement in knowledge about HIV/STI and have been associated with a positive and progressive changes in students’ attitudes towards these diseases. (55) While it is encouraging to note that most students in a developing country like Ethiopia, knew that HIV was an STI and were aware of the common modes of HIV transmission, it was alarming that knowledge of symptoms as well as the methods of preventing STIs, other than HIV, were poor. Most of those students were unaware that individuals having STIs, other than HIV, who underwent risky sexual behaviours, have a higher chance of being infected with HIV following contact with known cases compared to

persons without STIs. (56, 57) Therefore, HIV and STI health education is essential among young individuals, particularly those who have experienced sexual penetration.

2.2.6 Illicit substance use and high risk sexual behaviours in the world

Global illegal drug use has accelerated over recent decades, because of rapid industrialisation, urbanisation and population growth, in both developed and developing countries. Because of this concern, several studies have been carried out in developed countries to explore substance use problems among young people.

Since 2009, the rates of illegal substance use and alcohol consumption among Australian secondary students have increased strikingly. (58)

In 2013, about eight million Australians aged 14 years or over (42%) had illegally used drugs. This is three times more than the 2.7 million (14.7%) in 2010. However, there was a significant decrease in the use of ecstasy (from 3.0% to 2.5%) and heroin (from 0.2% to 0.1%). Moreover, the most common illicit substance used was cannabis, both recently and over their lifetimes, at 10.2% and 35%, respectively. (59)

Moreover, 4.4% of American adolescents and youths aged 10 to 24 years had ever used illicit drugs. (31) According to a study carried out in American Indian and Native American high school students in Alaska in the United States, 43.9% had used marijuana (cannabis), 13.8% tried marijuana for the first time before the age of 13 years, and 21.7% were current marijuana users.(60)

Over recent decades, substance addiction has been a large and growing problem for developing societies. In Asia, it was estimated that between

31.5 million (3.7%) to 64.6 million (4.3%) people had used cannabis. There is scant data and information on illicit consumption in developing countries, particularly in the MENA region. However, there is some evidence that the prevalence of risky behaviours associated with illicit drug use of youth has been growing in the MENA region, so unsafe sexual behaviours will have unfortunate consequences, considering the HIV prevalence estimates from the region.(61)

In 2012, in the MENA region cannabis consumption was estimated to involve 3.1% to 4.3% of the general population. Moreover, the consumption of opioids, cannabis, amphetamine and cocaine has been growing since 2012. It is worth mentioning that, cannabis use is strongly associated with all the sexual risk behaviours examined. (62-64)

It is highly plausible that young adults who have unsafe sex are frequently linked to sexual risk taking use of illicit substances. Furthermore, the use of illicit drugs is related to sexual behaviour that is of high-risk for HIV and other sexually transmitted infections. It has become evident that the primary defence against the spread of these diseases is prevention of the behaviours that result in HIV and STI transmission. (65-69) In addition, some researchers have noted that the type of substance used has been changing over the last decade worldwide as well as in Iran. Currently, methamphetamine (sexual enhancer) is one of the commonly used substances among young individuals. Epidemiological data suggested that methamphetamine use in 2013 was highest among adolescents between the ages of 18 and 25. (39, 70, 71)

Methamphetamine, also known as ice, tina, crystal, crank, glass, speed and meth, and other stimulants, are associated with various adverse physical and mental health consequences. In addition, methamphetamine is the most effective drug for risky sexual behaviours. (72) From an investigation into the prevalence and distribution of lifetime methamphetamine use in a sample of high school students in the United States, the results indicated that methamphetamine is a highly addictive stimulant drug. (70) In addition, as noted previously, young individuals who use stimulant substances would likely be at risk, not only for the direct adverse health effects associated with use, but also for other co-morbidities, such as sexually transmitted infections and HIV. Similarly, studies of both heterosexual and homosexual individuals indicated an association between substance use and risky sexual behaviours that included unprotected anal and vaginal penetrations and also sexual activity with multiple partners. (73-79) Given that illicit substance use, such as, methamphetamine, cannabis, hallucinogens, ecstasy and other stimulants, was associated with increased risky sexual behaviours, it was a significant public health concern. (72, 78, 80-83)

In addition, safe sex is important for protection against STIs, including HIV, and consistent and correct condom use along with a monogamous relationship are two important aspects for STI and HIV prevention. However, young individuals are more likely to have serial monogamous sexual relationships, a greater number of sexual partners and be inconsistent in their use of condoms. (71) Their behaviours may be

influenced by the situations of their lives, including peer pressure and drug use. (60)

In comparison, high-risk sexual behaviour rate in developed countries when compared with developing countries was almost one to three.

In the United States, about 30% of sexually active adolescents reported having multiple sexual partners over a year. A similar percentage (32%) also reported not using a condom during their last sexual penetration. The experience of having multiple sexual partners was also reported by 37% of those who reported using substances before their last sexual engagement. Females were more likely to report not using a condom during their last sexual penetration and they were also less likely to have multiple sexual partners, in comparison to males. (84)

A report in 2009 showed that 47.8% of American adolescents had ever had sexual penetration; moreover, 38.5% of those currently sexually active had not used any protection, such as condoms, in their last sexual engagement. (31) Another study indicated that 48.9% of American Indian and Native American high school students in Alaska have had sexual activity, while 8.3% had sexual activity for the first time before the age of 13 years. (60) Several other reports also showed a higher prevalence of risky sexual behaviours and substance use in adolescents and youths. (32, 62, 85, 86)

Given the higher prevalence of risky sexual behaviours and substance use, individuals between 15 to 24 years old represent nearly 25% of sexually active persons and account for nearly half of new HIV infections each year in the United States. (87)

Over recent decades, sexual activity has resulted in major and increasing modes of HIV transmission. (88-90) Being unprotected and having multiple partners for sexual engagement are the most common modes of sexual transmission of STI and HIV infections among young individuals. (88-91)

According to the report of the national Youth Risk Behaviour Survey (YRBS) in the United States, 15% of secondary school students reported having sex with four or more partners in their lifetimes, and this is fewer than the estimated 17% over only a 12-month period from Australian data in 2008. (92, 93) Factors such as early age of sexual development and relationship formation, and increased illicit substance use and alcohol consumption have been associated with increases in the number of sexual partnerships of young individuals in those developed countries. (94) (95)

According to findings from Uppsala, Sweden, about 99% of university students had sexual penetration and 97%, had received, and 94%, had given, oral sex. This study showed that the mean number of sexual partners had increased to 11 persons, compared with seven people in 2004. Sixty-five per cent had a first date intercourse without protection, compared to 45% in 2004. More than one-third (39%) had experienced anal penetration compared with 32% in 2004.

In addition, the experience of sexually transmitted infections (STI) had increased (21% in 2004 and 29% in 2009). Seventy-six per cent of students used condoms at the first intercourse. (58)

Furthermore, scant research is available so far from qualitative studies in the area of risky behaviours related to HIV and STIs. One of the evident examples of a qualitative study in the developed world was conducted with university students in a northern city in the United Kingdom. The target population was selected from university students under the age of 25, since they were at an increased risk of STIs. This study was part of a larger mixed methods research project, and the method of data collection included semi-structured telephone interviews, to investigate the sexual activity of university students in the UK. The results showed that the main reason for high-risk behaviours was the individuals' lifestyles. Poor access to sexual health services, stigma and lack of confidentiality were also perceived to contribute to the restricted use of sexually transmitted infection testing and protection devices. These reasons play important roles in influencing the risky sexual behaviours of university students in the UK. (96)

The findings attributed to developed countries showed that even with much education about protected sexual activities there was still an increase in risky sexual behaviours among young people. While, in societies with low-to-middle incomes, the rate of risky sexual behaviour was growing fast. For instance, the prevalence of unprotected sexual intercourse (42% in the previous year) was found in a sample of Chinese university students. In comparison, similar studies in the US, Sweden and the UK showed that unprotected sexual engagement rate ranged from 14% to 38 % in young individuals. (31, 97, 98)

As frequently reported, university students are one of the predominant groups among young individuals in any society likely to engage in risky sexual behaviours. While some research initiatives elucidated the prevalence of high-risk sexual behaviours in young populations, very few studies have examined behavioural data concerning university students, particularly in Middle East region.

The following paragraphs describe some cross-sectional studies conducted among students in low to middle income countries.

Adhikari et al, (2010) carried out a study on high-risk sexual behaviours among Nepalese college students. As a result, almost half (48%) reported using condoms during their first sexual penetration. (99)

Findings in Uganda reported that of those university students with sexual engagement experience, about half of the males (46%) and 23% of the females had three or more sexual partners in the previous 12 months, and 38% of the females and 32% of those males expressed that they did not use condoms with a new partner. (100)

From a study in university students in China, 17.6% of males and 8.6% of females were sexually active .The mean age for their first sexual experience was about 19 years for both genders. Moreover, among those who had been sexually active in the previous 12 months, males were significantly more likely to have had casual partners or commercial partners, like sex workers. Males were also significantly more likely to have had multiple partners than were females. In any sexual penetration in the last 12 months, condoms were rarely used by 35% of sexually active students of both genders. Regarding the gender of the partners,

3.4% of males and 2.9% of females reported having had a homosexual or bisexual engagement. Moreover, STI prevalence among Chinese university students was estimated at 1.5% for both genders. (101)

In Ethiopia, a study conducted by Dingeta and et al (2012) on high-risk behaviours in university students with a mean age of 21, roughly 77% reported having sex, and 51% of them had had a sexual engagement in last 12 months. Two per cent of male students also reported having sexual intercourse with a commercial sex worker. Six point four per cent of the sexually active students of both genders reported having had sex with a same sex partner (5.7% males and 11.4% females). In addition, 33.5% had sex with two or more partners and 29% reported having more than one sexual partner during the previous year. In addition, more than half (64%) had used a condom at least once; however, fewer than half (33%) had used condoms during their last sexual penetration. (102)

A study was carried out in Kenya among 1167 university students to assess the use of condoms and related factors. The results showed that 66% of the students had engaged in both sexually risky behaviours and substance use. Moreover, male university students used condoms significantly more than females. (101)

In contrast to cross-sectional projects, there are rare instances of mixed method studies or qualitative studies about risky behaviours related to HIV and STI among university students in developing countries.

The only mixed method study (quantitative and qualitative) among university students, was conducted in Jimma University in Ethiopia (2012). The outcomes revealed that about half the university students were

sexually active and among those who ever had sexual penetration, about 58% had used condoms. The main reason for having sex without condoms mentioned by university students included trusting one's partner, and condoms not being comfortable to use. (103)

In 2014, a mixed method study (cross-sectional study triangulated with a qualitative study) about risky behaviours related to HIV and STI was conducted among in-school and out-of-school young individuals in Ethiopia. As the result, 37% of in-school students reported having two, or more than two, sexual partners in their lifetimes, compared to 32.6% of out-of-school young individuals. Apparently, young individuals studying at school have more multi-partner sexual activity than out-of-school individuals in Ethiopia. (104)

2.2.7 High-risk behaviours related to HIV and STI in Iran

The rising prevalence of HIV among Iranian young people had drawn concern from this region and around the world.

In 2010, AIDS was the main problem for youth worldwide and more than 80% of these people lived in developing countries like Iran. About 50% of HIV infected people are 15 to 24 years old. (105, 106) Iranian's HIV epidemic began in about 1987, with the disease concentrated mainly among needle-sharing injecting drug users (IDU). Although injecting drug use is still the primary mode of HIV transmission in Iran, preliminary data from 2014 suggest that sexual transmission has increased and is now closely following IDU infection as a significant mode of HIV transmission. In 2011, a total of 23125 people were diagnosed with HIV in Iran, 91.5% of whom were male and 8.5% were female; and 2309 were infected by

sexual penetration.(107) This number increased to 28663 (88.4% males and 11.6% females) in 2014. The number of infections through sexual penetration increased to 3985. Therefore, the official numbers show that HIV prevalence through unprotected sex almost doubled from 2011 to 2014. (20, 108)

In common with other communicable diseases, STIs, including HIV, are mostly spread by the unprotected sexual behaviours of individuals. (48)

Young people are of particular importance in state policies against HIV and its subsequent sequel, acquired immunodeficiency syndrome (AIDS). According to the literature review, university students, as part of the young age group, are exposed to a range of risky behaviours, including HIV/STI. (102)

Studies show that the young individuals group is on the way of transforming into adulthood, full of ambition and developing their future social careers; therefore, ignoring their sexual health can lead to high social and economic costs.

Furthermore, there are informal reports of increasing trends of risky sexual behaviours, such as unprotected sexual contacts, multi-partnerships, and substance use among university students, especially those studying in highly populated cities in Iran. Universities admit significant numbers of young people in Iran. As such, it is necessary to provide targeted public health interventions to these populations. It has been acknowledged that young people in Iran engage in high risk behaviours for STIs and HIV infection. (34, 109, 110) However, there are

few studies on the reproductive and sexual health status of Iranian adolescents.

In 2006, the first official report among Iranian high school students indicated that about 41% of students took part in sexual activity. (27)

Likewise, for Iran, the governing values and norms of society in connection with the avoidance of pre-marital sexual activity or before a marriage commitment has helped most young individuals to avoid pre-marital sex. (10, 111) Inadequate sexual health education and also the failure in HIV prevention are major issues in developing countries. Economic circumstances, cultural taboos, sexual health problems, the penetration of religion and other ethical issues are among national policy obstacles in this connection. (112) Moreover, such factors as fast population growth, industrialisation, urbanisation, modernism and the penetration of western cultures contribute to increased risky sexual activity. (25)

There is evidence that unprotected sexual penetration is increasing dramatically among Iranian adolescents, with a mean age of 16 years. An official report expressed that among 2002 young male individuals, about 28% had premarital sexual activity and almost three out of four had more than one sexual partner. (27)

The study by Mohtasham et al (2009) conducted among Iranian male adolescents reported high levels of knowledge about HIV and STI; nevertheless, many did not perceive themselves to be at risk of HIV infection and still continued to engage in risky sexual behaviours, including unprotected sexual activity, having multiple sexual partners and

sex with commercial sex workers. It appears that male individuals are at risk of contracting HIV and STIs, and knowledge by itself could not protect them from engaging in risky sexual activity. (10)

Nearly half (46 %) of reported HIV positive cases were with young people aged between 25 and 35. (108) As previously discussed, the number of HIV patients transmitted via sexual engagement is increasing significantly. (34) Although it does not account for all cases of HIV infection, based on these data, high-risk sexual behaviour is among the serious risk behaviours for HIV transmission in Iran. The recent emergence of the HIV epidemic in Iran has made it urgent for researchers to assess the behavioural HIV risk profiles of the Iranian population. Moreover, there were no high levels of knowledge and attitudes towards this issue among young students in Iran. Moreover, misconceptions about modes of HIV transmission among high school students have still been reported. (113)

There has been scant research directly examining high risk sexual activity among the young population in Iran. Although HIV, STIs and the related risk behaviours among young Iranian individuals are known as major public health issues, only one investigation has been undertaken about HIV knowledge, attitudes and practice (KAP studies) so far in this region. (34, 114-117) Obviously, an important factor in the spread of HIV and STI in the developing world is believed to be poor knowledge about how the disease is transmitted and how it can be prevented. The study by Tavoosi et al. (2004) revealed that knowledge by students in Iran about HIV and STI was only moderate. In particular, STIs are not known among this group and they mostly did not know about the modes of transmission of

HIV. (118) Therefore, it is very important to educate the population in order to prevent the spread of HIV and STI. (119) (120)

As discussed previously, recreational substance use is associated with risky sexual behaviours. (65-68, 121, 122) These sexual behaviours include: a higher number of sexual partners, concurrent partners, unprotected sex, lack of condom use, and indiscriminate choice of sexual partners. (65-67, 123, 124)

Individuals engaging in unprotected sexual penetration or using substances like methamphetamine to enhance their sexual activity (125) are at increased risk of acquiring HIV and STIs.

Relationships between substance use and STIs are complex, but several studies have observed associations between substance use and STIs among young groups, such as university students. (65, 67, 126-128)

Although there has not been any quantitative study conducted on substance use among university students in Iran so far, some cross-sectional studies have addressed substance use among Iranian secondary school, high school students and college/pre-university students (the last year of the high school programme). The following paragraphs describe the original findings of some of these studies in detail.

The first published study, in 2003, showed that about 30% of Iranian high school students had used various substances once or more sometime during their times at high school. The report explained that high school students had used opium (3.5%), hashish (2.8%), marijuana (1%), heroin (2%), LSD (stimulant substance) (0.5%) and cocaine (1%). It is worth

mentioning that cannabis, known as grass, is used in Iran in both the form of marijuana and hashish. (129)

Furthermore, in 2004, the lifetime history of cannabis use was reported to be 0.2% in male secondary school students and also about 8.2% for male high school students as well. (130) A similar study in 2005 reported that among college students in the north of Iran, the lifetime prevalence use of ecstasy, opium and cannabis was 4.3%, 2.7% and 2.4%, respectively. (131) In 2005, a study showed that 2.4% of high school students in Lahijan, a large city in the north of Iran, had a positive history of ecstasy use. (132) This 2005 study reported that the rate of ecstasy use in males (3.35%) was significantly higher than in females (1.25%). (133) In 2006, Ziaaddini et al. published a study on substance abuse among high school students in Kerman, a city in southeast Iran near the eastern border with Pakistan and Afghanistan and, therefore, with a traditionally high rate of substance abuse. Their results showed that the rate for the lifetime use of drugs in high school students was 26.5% among males and 11.5% among females. Furthermore, the lifetime history of cannabis was 8.3% among male high school students and 2.8% among female students. The prevalence of daily cannabis use in this study was reported to be 3.1% in male students and 0.43% in female students. (134) In Tabriz, in 2007, another large city in the northeast Iran, about 2.0% of male high school students had experienced illicit substance use. (135) A similar study, (2009) in Zanjan, a large city in the northwest of the country, revealed a lifetime prevalence of drug abuse in high school students of 11.2%. The rate was significantly higher among males (19%) than females (7.7%).

About 2.8% had a lifetime use of cannabis and 5.7% of male students had experienced opium use and none of the females had a history of cannabis use.(136) In 2009, among college and high school students in Astra, Iran, the lifetime prevalence of ecstasy use was 5.6%, with ecstasy being a new drug in Iran at the time of that study. (137) In 2011, the prevalence of ecstasy use in female high school students in Tehran was estimated at 2.3%, and a drug party was mentioned as the place of first drug use and that access was very easy for most users. (138)

It is worth mentioning that ecstasy or MDMA (methamphetamine derived from 3,4-methylenedioxy methamphetamine) (139-141) increases sexual arousal, (125) and some individuals use MDMA specifically for sexual enhancement. Sexual risk taking behaviours (having multiple sexual partners, engaging in sex without a condom) are also highly prevalent among people who engage in sexual activity during MDMA episodes. (142)

Ecstasy was the most prevalent illicit substance used among university students in Iran from 2005-2010. The ease of access and the low cost of ecstasy were two strong reasons that encouraged students to use this substance. (138)

According to the only qualitative study conducted in university students in Tehran in 2011, ecstasy and methamphetamine represented the main stimulants used by university students. The reasons highlighted for using these substances were the declared desire to have excitement and enjoyment, participate in parties, a desire to be modern, and curiosity and

freedom away from their families. Almost all participants stated that use of methylphenidate (crystal meth) is more common than ecstasy use. (143)

To clarify, the prevalence substance of use and various types of drugs among students in various cities of Iran from research carried out since 2003, summarised in Table 2-1.

Table 2-1 Percentage of drug use among high school and college students in different regions in Iran, 2003-2011

Year of study	Research location	Grade of students	Names of substance use (%)
2003	Tehran	High school	Lifetime drug use: 30 Opium: 3.5 Cannabis: 3.8 Heroin: 2 Cocaine: 1 Other stimulants: 0.5
2004	Tehran	Secondary school High school	Cannabis 0.2 (males) Cannabis 8.2 (males)
2005	North of Iran	College	Ecstasy: 4.3 Opium: 2.7 Cannabis: 2.4
2005	Lahijan	High school	Ecstasy: 2.4 (males)
2005	Tehran	High school College	Ecstasy: 3.35 (males) Ecstasy:1.25 (females)
2006	Kerman	High school	Lifetime drug use: 26.5 (males) Lifetime substance use: 11.5 (females) Cannabis 8.3 (males) Cannabis: 2.8 (females)
2007	Tabriz	High school	Lifetime substance use: 2.0 (males)
2009	Zanjan	High school	Lifetime drug use:11.2 Cannabis: 2.8 Opium: 5.7 (males)
2009	Astara	College	Ecstasy: 5.6
2011	Tehran	High school	Ecstasy: 2.3 (females)

There is some evidence that the prevalence of other illicit substances has been increasing throughout the last decade, with the commonest illicit substances among young students so far being reported as cannabis and opium. (129, 134-136)

The aim of this study was to explore the range of high-risk sexual behaviours relating to HIV, STI and substance use among Iranian university students as a sample of the young Iranian population. It is apparent that there are many occurrences of risky behaviours among young people and, also, the young in Iran mostly go to universities after graduation from high school. Moreover, it was to be expected that the young educated people should be aware of high risk sexual behaviours and the way to protect themselves.

As the literature review identified, there are just over 12 key reports, articles and conferences papers that report high-risk behaviours among young people, particularly university students, around the world. The limited literature on these important risky behaviours in Iran, combined with increasingly elevated STIs, including HIV infections, among this population, suggested a need for further investigation.

2.3 Conclusions

HIV, a sexually transmitted infection, is one of the world leading infectious killers, claiming several million lives over the last three decades, mostly in developing countries. Other STIs are common among young populations especially after the increased use of substances that enhanced sexual intimacy. As university students are in the youth age category, they are

exposed to many risky behaviours, including substance use and sexual coercion, and STIs, including HIV. The incidence of unprotected sexual contacts in university students in different developing countries in the world is relatively high. In Iran, studies on these subjects are rare.

Throughout the course of this chapter it has become clear that the situation of the increasing rate of HIV, STIs and substance use is critical in Iran, and the reasons for this needed to be explored by researchers. The rate of high-risk behaviours related to HIV and STI are increasing in developing countries particularly among university students. Some high-risk behaviours were extracted from some studies and most were having unprotected sex (having sex without using condom), having sex with sex workers or street women, homosexuality and bisexuality and using various illicit substances.

While this current chapter provided an overview of potential issues at particular risk for contracting HIV and STIs, the next chapter will outline the particular research methods and research plan needed to address the gaps in the literature. It is important to discern what behavioural factors resulted in an increased rate of HIV and STI transmission.

CHAPTER THREE

3. METHODOLOGY

3.1 Introduction

This chapter describes the mixed methods study that was employed: a) A quantitative study of using an anonymous cross-sectional risk behaviour student survey; and b) A qualitative study using interviews with some expert individuals about high risk behaviours among university students. Its central premise is that the use of qualitative and quantitative approaches in combination provides a better understanding of research problems than either approach alone. The key aims of the study are discussed and the methodological approaches used to achieve these aims are presented in this chapter. The chapter concludes with a discussion of health promotion and behavioural change theories relevant to this study, particularly the theory of planned behaviour (TPB).

3.2 Theoretical framework

Epistemology is the study of how people know things and how they think they know things. Thus, it is concerned with the nature of knowledge, what establishes valid knowledge, what can be known and who can be a knower.(144)

Post-positivist epistemology was used in order to ground the research questions and provide the lens through which to interpret the findings. (144) Post-positivists embrace the theories, backgrounds, knowledge and values of the researcher that can influence what is observed. Post-

positivists follow objectivity by identifying the probable effects of biases. Post-positivists accept that human knowledge is based not on inarguable, solid foundations, but rather upon human conjectures. (145)

While this approach offers important benefits, it is limited in so far as the study will not be 100% free of subjectivity, and the results may not be applicable to all settings or situations.

As stated by Ryan AB (144) post-positivist research has the following criteria:

- Research is broad rather than specialised - many different things qualify as research
- Theory and practice are not kept separate. One cannot afford to ignore theory for the sake of “just the facts”
- The research motivations for, and commitment to, research are central and crucial to the enterprise. (146)
- The idea that research is concerned only with correct techniques for collecting and categorising information is now rendered inadequate. (146)

Post-positivism acknowledges the limitations of positivism and asserts that, as part of any investigation, a researcher comes “to some understanding of how people construct and maintain perceptions of the world” (144)

Furthermore, post-positivism asserts that, “[T] he value of values, passion and politics in research. Research in this mode requires an ability to see the whole picture or take a distanced view or an overview.” (144)

According to Ryan AB (144), a post-positivist researcher assumes a learning role rather than a testing one, and Wolcott identified the opportunities and challenges posed by this epistemological approach as follows.

“The researcher recognises the common humanity that connects researchers and the people who participate in research. We regard ourselves as people who conduct research among other people, learning with them, rather than conduction research on them.” (147)

An important distinction of post-positivism that is applicable to the studies undertaken in this research is the prioritisation of “problem-setting” over “problem-solving”. According to Ryan AB.(144), many of the research problem social researchers investigate, “do not lend themselves to ready answers” or conclusive results, “but are more appropriately addressed by research outcomes that offer thoughtful guidelines, principles,” and evidence based approaches address the problem, not necessarily solve the problem. Finally, “A critical post-positivist stance suggests that we cannot simply aggregate data in order to arrive at an overall truth and means that they recognise the complexity of the web of life and experience.” (144)

Both quantitative and qualitative research methods can be useful in post positivist approaches as one method is not privileged over another since “the appropriateness of methods depends on the questions being asked or the issues being explored.” (144)

In this research, the author’s design and subsequent study and results have been grounded in a post-positive epistemology, whereby the author

has searched for “meaning which can lead to value-led social change.” (144)

Four key tools were applied in this research project, and carefully incorporated into the studies: a) The concept of discourse;

b) The concern with power; and c) The value of narrative, the need to be reflexive. (144)

The application of these tools is operationalised in the various studies included in this dissertation and summarised in the following sections.

In this mixed method research a post-positivism paradigm of epistemology has been used.

3.3 Methods

A mixed methods approch was conceived as the most appropriate way in which to comprehensively respond to the various questions and aims identifed in this research project. The methodological elements of this research project have been depicted in Figure 3-1, below.

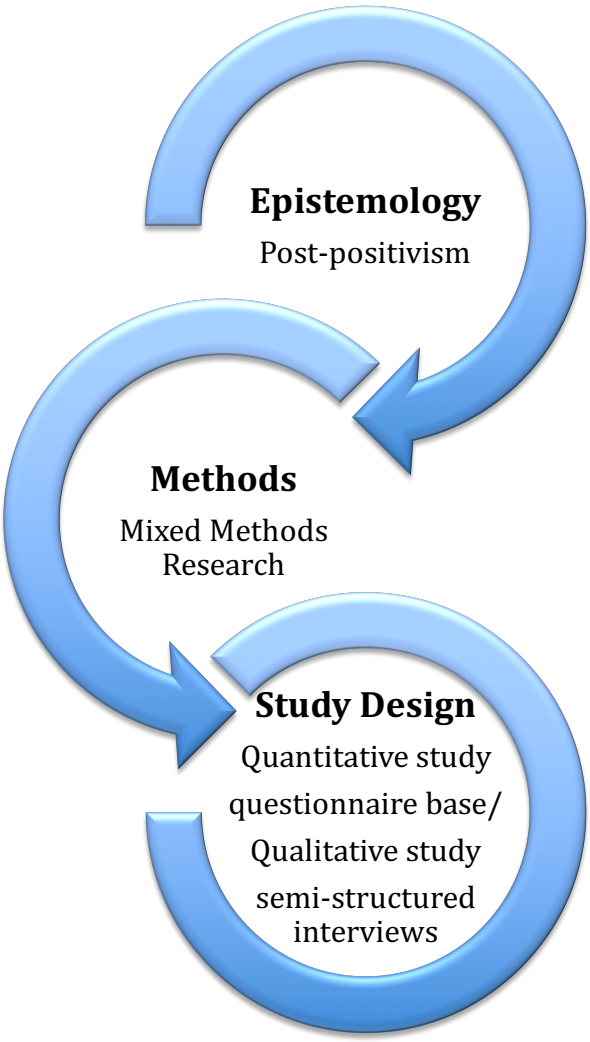

Figure 3-1 Methodological elements of the research project

3.3.1 Study type

A mixed methods study focuses on collecting, analysing and integrating both qualitative and quantitative data in a single study.

Qualitative data includes closed-ended information, such as that found in attitudes, behaviours or performance instruments. The analysis of a quantitative study consists of statistically analysing scores collected on specific instruments, checklists, or public documents to answer some research questions or to test hypotheses. (148) By contrast, qualitative data consisted of open-ended information that the researcher gathered during interviews with the participants.

Generally, open-ended questions asked during these interviews allowed the participants to provide answers in their own words. Moreover, qualitative data may be collected by observing the participants or research settings, gathering documents from different public or private sources, or collecting audio-visual materials, such as videotapes or artefacts. The analysis of the qualitative data (words/text/images) typically followed the path of combining the words or images into groups of information and presenting the variety of ideas gathered during data collection. (149, 150)

3.3.2 Study design

The mixed method design in this investigation fitted the research problem and questions. On the one hand, quantitative data have the potential to provide assessable evidence and yield efficient data collection procedures and generate the possibility of generalisation to a population to facilitate the comparison of groups. On the other hand, qualitative methods facilitated the collection of data when measures did not exist to provide an in depth understanding of the concepts. In this study, quantitative and qualitative data were gathered, then the quantitative and qualitative results are reported in separate sections, while a discussion highlights the main point of the study and clarifies the interpretation of the study outcomes. As shown in Figure 3-2 below, the ultimate results were extracted from both the quantitative study and qualitative study outcomes.

Figure 3-2 Mixing quantitative and qualitative data

3.4 Study-1: Quantitative study

A comprehensive and anonymous quantitative survey was conducted among university students in Tehran. This study was a part of a mixed method study in the field of HIV, STI and high-risk behaviours.

In this part, participants were randomly selected from students studying at universities in Tehran. There were several universities in Tehran; therefore, Tehran city was divided in four separate regions (north, south, east and centre, and west).The universities located in these areas selected were: UA: the University of Art, UE: the University of Economics, UNM: the University of Nursing and Midwifery, UEng: the University of Engineering, UH: the University of Humanities, UME: the University of Mathematics and Engineering, and UM: the University of Medicine then, according to the number of universities located in each region, 100 samples were taken from each region. First and, most importantly, an announcement was prepared and put on the notice board at each university in advance. The announcement included the name of the project and information about a briefing meeting that was being held at the university by the researcher. In that briefing meeting the researcher described all the information required about the project in detail and students were asked whether they were willing to be involved in the research. If they agreed, the questionnaire was distributed. All participants remained anonymous and their information confidential all times during and after the project. Student participants received the questionnaire and written information about the project, including details about confidentiality. Participation in the study was voluntary and they were

advised to withdraw from the study whenever they felt to do so. The questionnaires did not collect any identifying information. All students had the opportunity to choose whether they participated in this project. A simple random sampling procedure was employed to ask the students in each university hall to fill out the questionnaire.

3.4.1 Aims of the quantitative study

Aim-1: To explore sexual high risk behaviour among university students in Tehran

Aim-2: To estimate the prevalence of STIs among university students in Tehran

Aim-3: To estimate the prevalence of multi-partnerships or other high-risk sexual behaviours in university students in Tehran

Aim-4: To explore illicit drug usage among university students in Tehran

Aim-5: To explore various types of illicit drug use among university students in Tehran

3.4.2 Study population

Participants eligible for this research were full time university students of both genders (male and female) studying in public or private universities located in Tehran city.

Other inclusion criteria included the ability to provide informed consent, which was assumed if, and when, a participant voluntarily chose to complete the questionnaire. Exclusion criteria included the refusal of the student to participate in this survey.

The specific inclusion/exclusion criteria established allowed the researcher to better meet the study's aim and objectives.

The aim of this study component was to identify associations of high-risk behaviours among university students in Tehran. Therefore, it was of prime importance to exclude non-university students.

3.4.3 Calculation of the sample size

A sample size, based on using the average prevalence of high-risk behaviours in China and Ethiopia, was estimated. (101, 102) The sample size calculation was based on similar studies conducted in Ethiopia and China. China and Ethiopia were two countries that have close socio-economic similarities with Iran. The Ethiopian study's response rate was 35% and the Chinese study's response rate was 60%. We estimated our sample size at 50% to cover for any non-responses. If the response rate was similar to the Ethiopian study, then the formula below was used to calculate the sample size. A 95% confidence level was applied; assuming that the true proportion of the university student population in Tehran will fall within the specified confidence level.

The average estimate of the university student's sample size was calculated to be 400.

P (Prevalence) = 50%
d (Deviation) =5% d ≤ 20% P
CI (Confidence Interval) α=0.05, 1.96

$$n \geq \frac{Z_{\alpha}{}^{2} P(1-P)}{d^{2}} = \frac{1.96^{2} \times 0.50 \times (1-0.50)}{5\% \times 5\%} \approx 400$$

3.4.4 Participant recruitment

The universities were purposively selected as it was only possible to gain permission to conduct this research in the selected universities, so a convenient sampling procedure was employed to ask students in each faculty to fill out the questionnaire.

The students had been invited to this study by an announcement. A fixed quota of 100 students was targeted in each quadrant of the city, where they were recruited by self-selection from seeing posters or group presentations.

The sampling method chosen did not require the students to self-identify, which may have placed participants at risk; rather, the use of convenience sampling through the administration of a survey questionnaire in a sealed envelope without any identification, protected the anonymity and privacy of the survey respondents.

3.4.5 Data collection and description of variables

The data collection was carried out from January to March 2014. Self-administered questionnaire were used for data collection. The researcher described the information required about the project in detail in a briefing meeting and students were asked whether they were willing to be involved in the research. If they agreed, questionnaire was distributed among these students.

Participants were informed of the process for questionnaire return by a notice at the bottom of the questionnaire envelope, which gave the location of a secure collection box in each university. Each participant put

his/her own questionnaire in the envelope and the completed questionaries were returned to the secure collection box; this was to protect the anonymity of participants.

Students were asked to complete a self-administrated questionnaire that included demographical questions comprising age, gender, marital status and questions about their illicit drug use and sexual behaviours.

The main demographic independent variables included gender, age, marital status and universities where each of the students were studying. In addition, dependent variables were described as: a) illicit substance use; and b) unprotected sexual activity. Unprotected sexual activity was defined as respondents reporting not using condoms in the last sexual engagement for least on two of the three types of sexual penetration (oral, vaginal and anal).

In addition, the illicit substance use variable was described as using an illegal substance even once over their lifetimes.

3.4.6 Study instrument

A comprehensive, quantitative instrument containing 35 questions was developed by the researcher. The Cycle 6 NSFG (National Survey of Family Growth), which has been adapted from the CDC (Centre of Disease Control and Prevention), was the key guiding document that informed the development of high-risk behaviours related to HIV, STI and substance use. Domains in this instrument included demographics and social questions as a warm up, then substance use and sexual behaviour patterns. The original questionnaire was developed in English and was

accurately translated into Farsi (Iranian language) by the researcher. (Appendix A)

This study measured standard indicators of suitability using the recommended method for the survey of high-risk behaviours. (151) (152) This was the first instrument intended to collect comprehensive data on substance use and sexual behaviours related to STIs and HIV infections within university students in Iran.

In this study component, student participants received the questionnaire and written information about the project, including details about confidentiality. A letter of introduction was included in the first section of the questionnaire that briefly explained the subject of the proposed research study. The questionnaire was designed in three sections: first, there were some demographical characteristics and some warm up questions; secondly, substance use questions; and thirdly, sexual behaviour questions. Culturally, the substance use questions were more acceptable than the sexual behaviour questions by Iranian university students so, to reduce the feeling of stress, the substance use part was put before the sexual behaviours section.

Participants responded anonymously through a questionnaire, which required 30 minutes to complete and assessed demographic characteristics, substance use and sexual behaviours. There was also the address and phone number of health care services provided to answer any personal questions at the end of each questionnaire.

3.4.7 Data management

After completing data collection, data sheets were counted and checked before the data were imported into IBM SPSS software, version 21 for statistical analysis.

The dependent variables which contributed to an increased high-risk behaviours related to HIV and STI were then identified. These included: a) substance use (defined as respondents reporting using illicit substances in life time); and b) Having unsafe sex or unprotected sexual activity (defined as respondents reporting not using condoms in the last sexual penetration).

All three types of sexual activities can transmit HIV. Therefore, when measuring unsafe sex activity, it was important to clarify that unsafe sex meant anal, oral and vaginal sex, regardless of using condoms for contraception, protection or for any other reason because using condoms for any reason was considered as having safe sex.

Not using condom in more than 50% of sexual activities was therefore considered unsafe sex in this study. This meant that:

1- For a person who has had only one type of sex (e.g. oral) if he/she did not use condom it was considered to be unsafe sex.

2- For a person who had two types of sex (e.g. oral and anal), if he/she did not use a condom in No 1 and No 2 then it was considered to be unsafe sex.

3- For a person who had all three types of sex (oral, anal and vaginal) if he/she did not use condom in No 2 or NO 3, then it was to be considered unsafe sex.

Independent variables were then selected based on findings from the descriptive analysis for both substance use and unprotected sexual activity.

3.4.8 Statistical analysis

3.4.8.1 Descriptive statistics

Descriptive analysis was conducted to establish the percentages of all the high-risk behaviours related to HIV and STI from the quantitative study. Analysis was carried out in two categories, females and males separately, and also for entire study population. To measure the extent of the association between the two categorical variables, a Chi-square test of independence was performed. Independent variables like age were continuous in nature and were transformed into categories to test the existence of interrelationships among the categories.

The Chi-square (χ^2) test was used to determine whether there were differences between the two categories.

Two-sided tests were performed for all analyses and the level of significance was set at $P<0.05$. Where appropriate, 95% confidence intervals (CIs) were also reported along with *P* values. Descriptive statistics were expressed as percentages for the categorical variables.

3.4.8.2 Inferential statistics

Logistic regression analyses were conducted to assess the demographic characteristics and behaviours associated with the dependent variables.

Consequently, multivariate logistic regression models were carried out to determine the factors significantly associated with the independent variables identified in the descriptive findings or in the data analysis plan. Multiple logistic regression models were fitted in order to adjust for potential co- confounders. The multiple logistic regression models retained all significant factors from the univariate analysis conducted.

Interferential testing was also carried out using IBM SPSS statistical analysis software version 21 with the significance level of the statistical tests fixed at 0.05. Logistic regression analyses were conducted to assess the demographic characteristics and behaviours associated with the dependent variables, each of which contributed to an increase in the high-risk behaviours related to HIV and STI. The univariate and multivariate logistic regression analyses were used to estimate crude and adjusted odds ratio (OR, 95% Confidence Interval).

Independent variables were selected based on findings from the descriptive analysis for both substance use and unprotected sexual activity. Items significant at $P<0.05$ were included in the final multiple logistic regression model. In addition, the related factors that were found significant from the literature were included as independent variables.

Consequently, the univariate logistic regression models were carried out to determine factors significantly associated with the independent variables identified in the descriptive findings.

The multiple logistic regression models were fitted in order to adjust for potential co-confounders. The multiple logistic regression models retained all significant factors from the univariate analysis conducted.

3.5 Study-2: Qualitative study

3.5.1 Aims of the qualitative research

In order to identify reliable data the author applied a qualitative study for exploring high-risk behaviours among university students.

The aims of the qualitative study are as follows:

Aim-1: To explore high-risk sexual behaviours among university students in Tehran

Aim-2: To explore different opinions of STI among university students in Tehran

Aim-3: To explore multi-partnerships and other high-risk behaviours among university students in Tehran

Aim-4: To explore the extent of illicit drug use among university students in Tehran

Aim-5: To explore various types of illicit drug used among university students in Tehran

3.5.2 Data collection and participants

Participants were purposefully selected from a list of known significant people who had an influence on young individuals and in recognition of their unique expertise in their respective fields. These people had first-hand information of how young people at university behaved and they also had close interactions with university students and had observed their problems.

Those included were: counsellors and mentors, specialists in infectious diseases, general practitioners, specialists from a counselling centre for the reduction of high-risk behaviours, and the other people who had

interactions with university students in the field of counselling or health services. These expert people were invited to the project by an email that described the details of the project and the questions that were to be asked. Those who volunteered were invited to the study and then completed a consent form for the study.

Semi-structured interviews were then employed. The researcher spent about one hour interviewing participants, in Farsi, within their environment. Interviewing was continued until all categories were saturated (receiving similar answers as well as responses from participants) and no new themes emerged. With the informed consent of the interviewees the interviews were audio recorded. Audio recordings were stored securely in a non-identifiable form. All interviews were completed in Iran among people who spoke Farsi (Iranian language); their voices were recorded. The researcher then analysed their words and gave them codings and sub-codings in English; the main interpretation and quotations were also translated into English by the researcher. The participants remained anonymous, and their results confidential, at all times during and after the project.

3.5.3 Interview guide

The semi-structured interviews were broadly guided by the main questions and the interviews continued with other relevant questions in each session in detail. The interviews were initiated by questions related to substance use and then continued to high-risk sexual behaviours, STIs and other relevant factors. Detailed questions related to each part were

then asked to explore the issues in detail. To achieve the aim of the study the questions in each section of the qualitative study were designed according to the quantitative study questionnaire. (Appendix B)

3.5.4 Theoretical framework for the qualitative study: phenomenology

Phenomenology, in Husserl's opinion, is principally concerned with the systematic reflection on, and study of, the structures of consciousness and the phenomena that appear in acts of consciousness. A set of theoretical approaches that attempted to understand the way in which people experienced the world they generate and inhabit; the study of human consciousness and experiences in everyday life. Phenomenology highlights the importance of each person's unique subjective experience of events in the way he or she reacts to the events. (153) The phenomenological approach aimed to develop a complete, accurate, clear description and understanding of a particular human experience or experiential moment. In qualitative research, phenomenology aims to identify, as well as describe, the subjective experience of the participants. It is a matter of studying everyday experiences from the point of view of the subject and ignores critical evaluation of forms of social life.

3.5.5 Data extraction and analysis

The qualitative responses collected in Farsi were exported into Open code software version 3.6 year of 2012 to facilitate backward and forward

language translation and coding. The researcher conducted language translation, coded the qualitative responses, and extracted themes and sub-themes from the transcriptions. Data was transcribed verbatim and coded by the researcher. The standard framework analysis procedures (Ritchie and Spencer, 1994) were implemented to analyse the data. All transcripts were analysed by the chief the researcher using the framework described by Ritchie and Spencer. (154)

This qualitative analysis was undertaken via framework analysis.

The framework analysis included five stages: a) Familiarisation; b) Identifying a thematic framework; c) Indexing; d) Charting; and e) Mapping and interpretation.(149) In framework analysis the researcher first becomes familiar with the data by reading and re-reading the notes and transcripts. The researcher then prepares a list of anticipated and emerging themes that can be placed within a thematic framework. A series of thematic headings were then sorted hierarchically into main themes and sub-themes. These headings were used to label or index the original data (some allocate numbers to various headings to facilitate this, others use words or phrases).(149)

The texts were read several times to identify interesting features and the relevant data were then collated and coded. Related codes were collected into possible themes that illuminated the understanding of issues narrated by the participants. Emerging themes were refined and further analysis performed by moving back and forth between ‘the parts and the whole” of the transcribed texts to detect the structures of the main themes. All

themes were reviewed and analysed, and then related to the research question.

Validity check

In qualitative studies, each participant had the opportunity to review their individual transcript. Therefore, the transcripts were sent to them before the analysis took place. They were able to raise any concerns they may have about his or her interview transcript, or request edits, at this stage.

3.6 Health promotion and behavioural change theories

Behavioural change theories in health promotion are attempts to explain why behaviours change. Each behavioural change theory or model focuses on different factors.

After reviewing the relevant literature, the theory of planned behaviour (TPB) was selected as the main theory behind this study. TPB, created by Icek Ajzen, (155) includes all the constructs in the Theory of Reasoned Action plus the additional construct of perceived behavioural control. It emphasises the role of 'intention' in behaviour performance; however, is intended to cover cases in which a person is not in control of all the factors affecting the actual behaviour. (155, 156)

Cultural issues changing from tradition to modernity, religious issues and the lack of knowledge and information about HIV and STI, as the major reasons for high-risk behaviours among university students in Tehran. As shown in Figure 3-3, TPB suggests that behaviour is dependent on one's intention to perform the behaviour. Intention is determined by the individual's attitude (beliefs and values about the results of the behaviour).

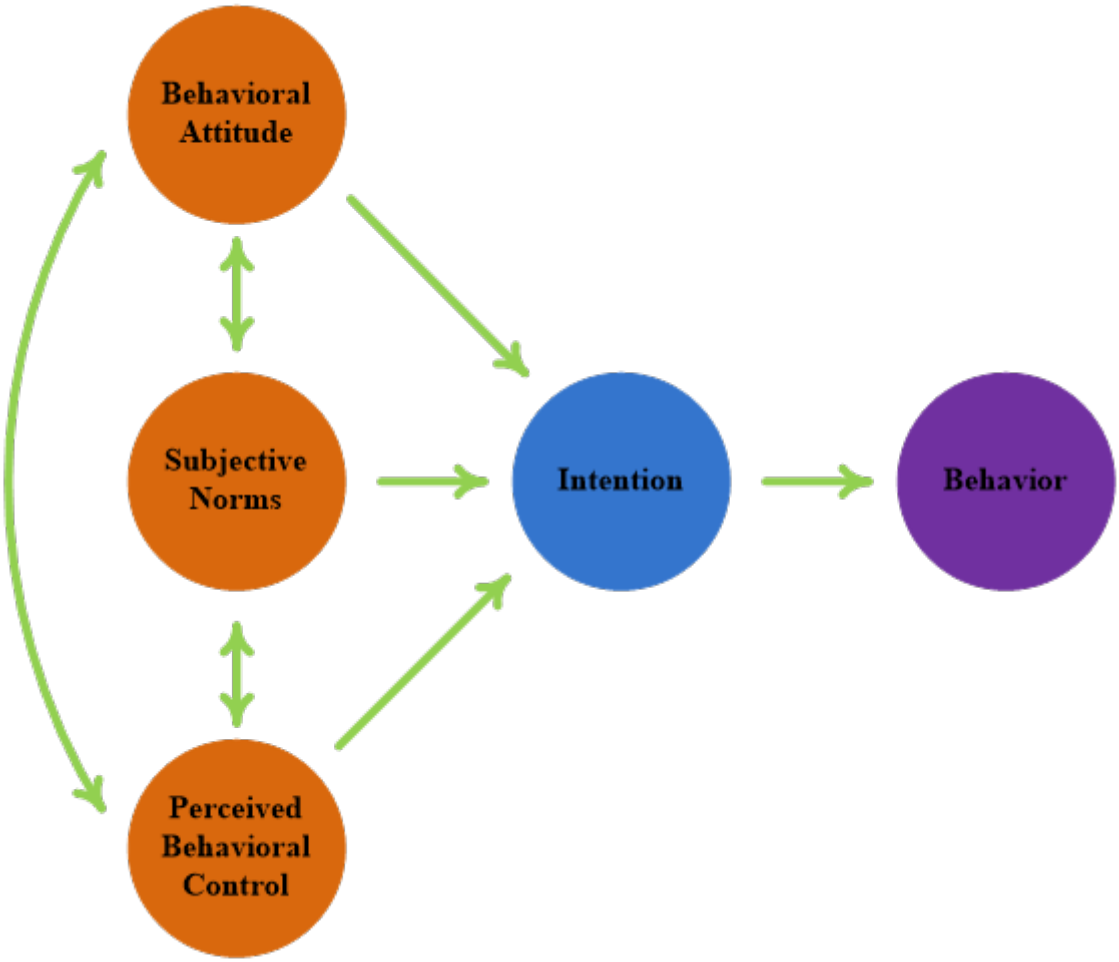

Figure 3-3 Model of the Theory of Planned Behaviour (Theory of Reasoned Action)

Beliefs and values about the outcome of risky sexual behaviours have changed in Iran, while moral attitudes and social values have changed among young university students. Abstinence is declining and having sexual activity before marriage is not such an unfavourable act now; conversely, in the past, talking about sex always was forbidden, even in families, and girls were afraid to ask anything related to sexual issues. However, both males and female students were not willing to talk about their previous sexual activities since, in traditional Iranian culture, virginity was of value for both genders. Therefore, there is paradox here which

makes students pretend to fake virginity and this leads them to undertake risky sexual behaviours.

In addition, subjective norms (beliefs about what other people think the person should do or general social pressure) are common:

The Iran government follows Islamic norms, which restrict free relationships between boys and girls; consequently, those limitations have influenced young individuals' beliefs. Instinctively, young individuals were willing to have relationships with the opposite sex, but within those limitations they have to hide their sexual relationships.

There are paradoxical behaviours among young university students that go back to cultural and social issues in Iran. University students will have needed to pass a very competitive entrance exam to enter university. After a long time deprivation from the opposite sex at school, they come to university eager to explore everything, including sexual activity, for the first time and are keen to enjoy the moment. Some superficial desires like beauty, luxury cars and luxury life would be enough for a person to choose to have a sexual engagement.

Other general social pressures, such as the many restrictions on the media in Iran, to showing any normal relationships between men and women, and also women performing on TV having specific dress codes to cover their bodies and hair, encourages Iranian young individuals to find illegal and inappropriate movies from satellites, which are also forbidden. Family movies shown on satellite TV encourage audiences to have constant multiple-sexual partners. These attractive programmes are the real reason for the increasing risky sexual behaviours in Iran.

Students who have the most sexual experiences were interesting for their peers. When students meet someone at university who speaks of his sexual experiences they look at him as a hero; they are then provoked to be a hero too, so follow him blindly without thinking, or correct information about sexual relationships.

Stigma and disgrace about sexual activities are other reasons that provoke university students to have high-risk sexual behaviours. This stigma begins from childhood in families. Therefore, one of the predominant reasons that pushed students into high-risk behaviours was being afraid to talk about sexual issues because of the stigma as well as it being taboo. Sex as a taboo or prohibited is other major issue for turning sexual activity into a dangerous act among young university students in Iran. Given that many university students have unsafe sexual behaviour and do not know how to use condoms as protection, they are rarely willing to have protected sex because it is embarrassing for them to purchase condoms from the chemist. Only males are able to talk about their sexual activities easily. This means that females are victims of this stigma in society, despite being more vulnerable to getting HIV than males.

There is no organised educational programme for sexual health about the consequences of having unprotected sexual activities in high schools and universities in Iran. High-risk sexual behaviours were common among university students, although university students have little information about HIV or STIs as that knowledge had not yet been turned into action. They do not know exactly how to protect themselves against STI and HIV, and they still have huge numbers of unanswered questions in their minds.

There was some evidence that not only university students, but also their parents, lacked education and information about sexual health. Most parents have scant information about sexual health and STIs and the modes of transmission of HIV and, now and then, even instructors have limited information about the signs and symptoms and treatment of STIs either.

Moreover, behaviour is also determined by an individual's perceived behavioural control, defined as an individual's perceptions of their ability or feelings of self-efficacy to perform a behaviour. This relationship is normally dependent on the type of relationship and the nature of the circumstances.

University students followed their peers and were afraid to be judged; therefore, they never avoid some risky behaviours; such as having risky sexual behaviour or using illicit drugs.

Behavioural attitudes, like moral attitudes and social values to fading abstinence, subjective norms like restricted norms and rules in males and females relationships, and perceived behavioural control like feelings of rejection from their peers, make students not able to resist performing behaviour. Therefore, these three components make an intention which then turn into risky behaviours.

3.7 Ethical approval

Ethics approval was sought and granted from the Flinders University Social and Behavioural Research Ethics Committee.

In describing the ethical issues it was important to note that, there was no specific ethics committee or specific process for ethical approval in Iran.

This meant that just having permission from a research centre affiliated to Tehran University, such as the Research Centre for HIV/AIDS, was equivalent to having ethical approval. Since the head of the Iranian Research Centre for HIV/AIDS gave permission to collaborate with Flinders University, and for the main investigator of the project to undertake this research, by providing an official letter. This was attached to the ethics documents and sent to the Flinders Ethics committee, so this project was eligible to be conducted among university students in Tehran under the supervision, as well as permission, from this Institute. The permission of each university in Tehran had been received in advance. The head office of the Iranian Research Centre of HIV /AIDS (IRCHA) contacted each university to give permission to conduct this survey among university students in Tehran.

Due to ethical considerations and the sensitivity of the subject matter in question, responses to questions in all sections of the questionnaire were optional to answer.

Moreover, all participants, including the interviewees in the qualitative study and questionnaire participants in the quantitative study, remained anonymous and their results confidential, and because seeking verbal consent was not applicable, in questionnaire participants, therefore, returning the questionnaire was considered to be giving consent.

In addition, there was no obligation to take part in this project. Participation in the study was completely voluntary and the participants were advised that they could withdraw from the study whenever they felt to do so.

3.8 Conclusions

Throughout the course of this chapter it was clear that a mixed method that included a quantitative study and a qualitative study, systematically responded to the main questions and aims identified in this research project. First, post-positivism justified the epistemology of this study. The two quantitative and qualitative studies had their study design, data collection, research instrument, sample size calculations and the main points of the methods were explained separately. The information from this mixed method study obtained from the students, was analysed statistically to provide an estimate of the prevalence of HIV and STI risk-related behaviours for discussion in the next chapter. In addition, the patterns of risky sexual behaviours, illicit drug use and estimating the prevalence of STI among university students in Tehran were acquired. The theory of planned behaviour (TPB) was then selected to justify the health promotion and behavioural change theories in this study. As stated above, there has not been a study of this kind in Iran previously.

CHAPTER FOUR

4. QUANTITATIVE STUDY FINDINGS

4.1 Introduction

This present chapter outlines a comprehensive set of descriptive and analytical findings related to the quantitative study. The results achieved the aims set out in Chapter 3, which were identified as: a) estimating the prevalence of unsafe sexual activity; b) estimating the prevalence of STIs; c) estimating the prevalence of multi-partnerships or other high-risk sexual behaviours; d) estimating the prevalence the illicit substance usage; and e) estimating the prevalence of various types of illicit substance usage.

The findings of the study components are presented below in two sub-sections. The descriptive results are presented in the first sub-section and include demographic data of the study participants, as well as a set of comprehensive frequencies associated with the distinct survey components. In the next sub-section the logistic regression models are presented to determine factors significantly associated with the independent variables identified in the descriptive findings. This chapter also discussed the statistical analysis of the quantitative study followed by the findings extracted after analysis.

4.1.1 Descriptive statistics findings

Out of all possible participants, 400 students were recruited for the study. Among these participants 392 (98%) completed the questionnaire. Only data from these respondents were included in the data set analysed in this quantitative survey.

The response rate was 98% (n=392) and the descriptive analysis was computed for the first part. The main demographic findings included gender, age, marital status and university name.

There were males (N= 230, 58.7%) and females (N= 162, 41.3 %). The respondents' mean age was 22 (range 18-35) and the mode was 22 years old. Marital status was single (N= 368, 94%) and, significantly, there were more single males than single females.

The distribution and number of respondents according to the region of the universities (north, south, east and west) were calculated: University of Art (UA) 38 (9.69%); University of Economic (UE) 43 (10.96%); University of Nursing and Midwifery (UNM) 75 (19.13%); University of Engineering (UEng) 48 (12.24%); University of Humanities (UH) 79 (20.15%); University of Mathematics and Engineering (UME) 88 (22.44%); and University of Medicine (UM) 21 (5.35%).

Three hundred and thirty-eight (86.2%) university students reported they had not ever been tested for HIV.

When the questionnaire asked if they had ever had a sexual engagement, 144 (36.5%) of university students responded, Yes. In addition, 58 (14.8%) of respondents responded, Yes to the question about the experience of substance use at least once in their lifetimes.

The demographic characteristics of the respondents are shown in Table 4-1, by gender. Among the 392 respondents 230 were male and 162 were female.

Table 4-1 Demographic characteristics of the university students in Tehran, 2014 (n=392)

Characteristics	Male N (%)	Female N (%)	Total N (%)	Male vs. Female *P*-value
Age (mean + SD)	22.50 ± 2.7	21.26 ± 2.7	21.98 ± 2.7	0.000
22 years old or younger	149 (64.8%)	138 (85.2%)	287 (73.2%)	0.000
Single	221 (96.1%)	147 (90.7%)	368 (93.9%)	0.030
University				
UA	18 (7.82%)	20 (12.34%)	38 (9.69%)	0.000
UE	16 (6.95%)	27(16.66%)	43 (10.96%)	
UNM	37 (16.08%)	38 (23.45%)	75 (19.13%)	
UEng	39 (16.95%)	9(5.55%)	48 (12.24%)	
UH	39 (16.95%)	40 (24.69%)	79 (20.15%)	
UME	71 (30.86%)	17 (10.49%)	88 (22.44%)	
UM	10 (4.34%)	11 (6.79%)	21 (5.35%)	
Ever attended a students' community	92 (40%)	45 (27.8%)	137 (34.9%)	0.020
Ever attended a students' party	111 (48.3%)	51 (31.5%)	162 (41.3%)	0.001
Knowing student(s) who are using drugs	157 (68.3%)	66 (40.7%)	223 (56.9%)	0.000
Having friend(s) who are using drugs	134 (58.3%)	33 (20.4%)	167 (42.6%)	0.000
Ever attended a drug party	89 (38.7%)	23 (14.2%)	112 (28.6%)	0.000
Ever tested for HIV	38 (16.5%)	16 (9.9%)	54 (13.8%)	0.051

UA: University of Art, UE; University of Economics, UNM; University of Nursing and Midwifery, UEng: University of Engineering; UH: University of Humanities; UME: University of Mathematics and Engineering; UM: University of Medicine.

4.1.1.1 University students who had ever had a substance use experience

Out of the 392 respondents 58 (14.8%) had experience of substance use at least once in their lifetimes, as shown in Figure 4-1, while the male students had significantly more experience of substance use than females. In addition, 55 (94.8%) of students with experience of substance use were single, and 31 (53.4%) were aged 22 or younger than 22. The age categories of students by substance use experience are shown in Figure 4-2.

In addition, out of the 392 respondents, 43 (11%) had experienced grass use and six (1.5%) had used crystal meth; 10 (2.6%) had used cocaine; 16 (4.1%) had experienced hallucinogenic use; three (0.8%) had used ecstasy; four (1.0%) had used heroin (crack); two (0.5%) had injected an intravenous (IV) drug; 11 (2.8%) had experiences of other stimulant use; five (1.3%) had used opium; and 13 (3.3%) had used other substances at least once in their lifetimes. They mentioned some names of some other substances, including: ketamin, kook, ayahausca, morfin, acid (LSD), magic mushroom (hallucinogenic) and krokodail (an opium derivative).

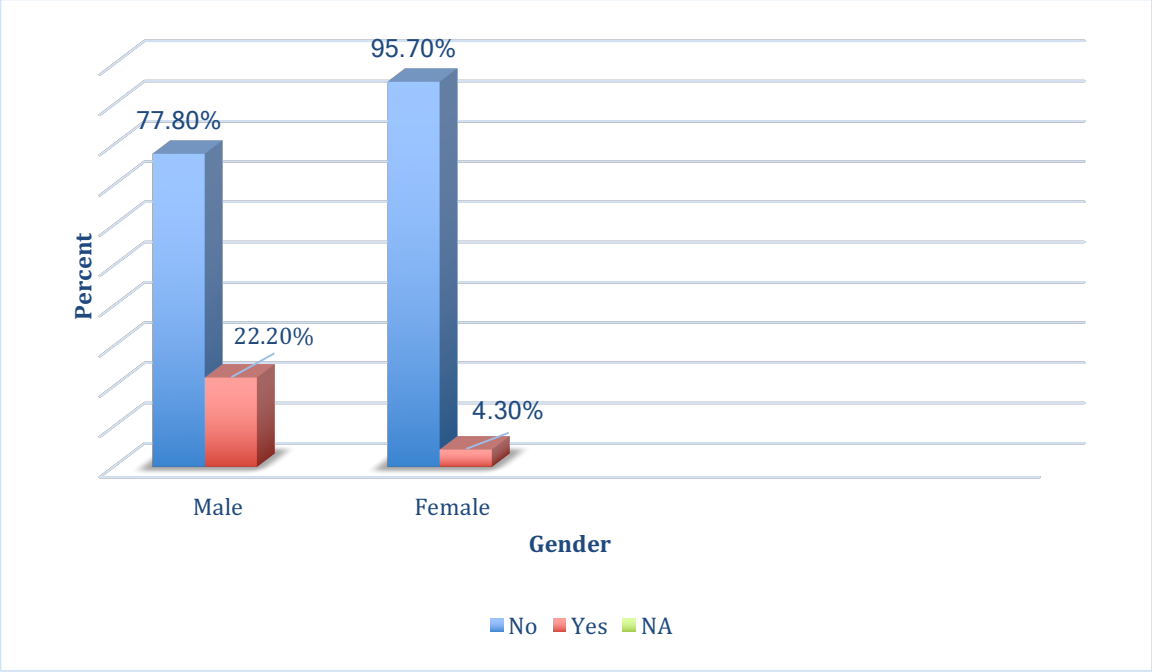

Figure 4-1 Substance use reported by male and female university students

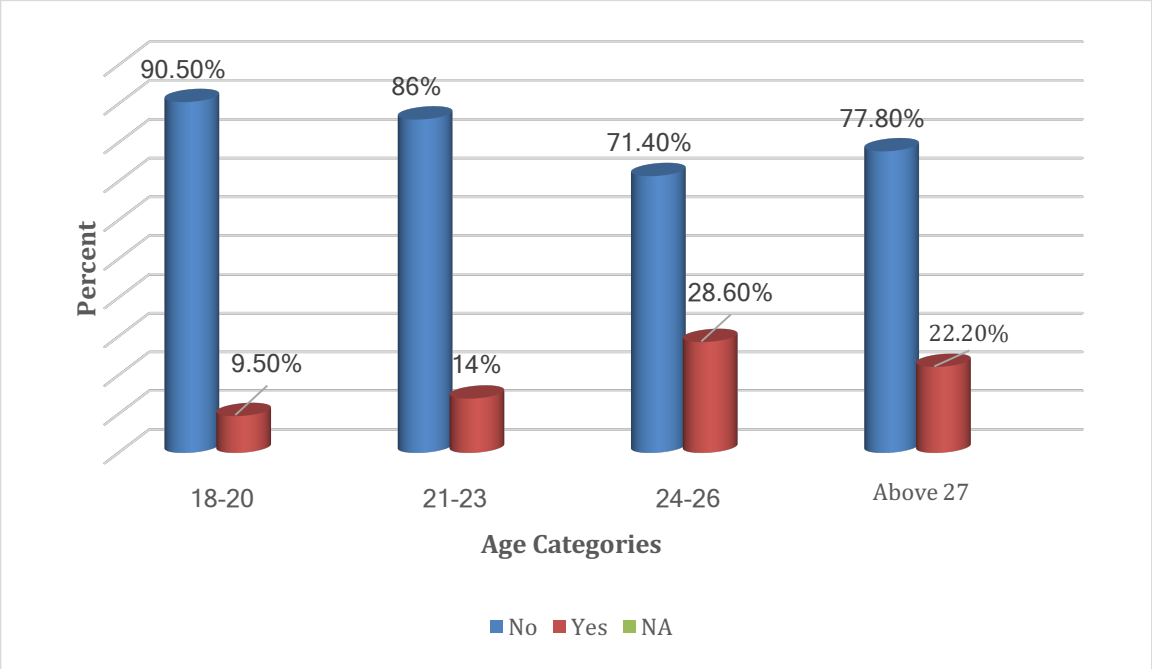

Figure 4-2 Substance use reported by university students in age categories

Among those 58 university students with experience of substance use, 44 (75.9%) had been in a drug party at least once, and 53 (91.4%) had at least one friend who was using drugs. Fifty-one (87.9%) had were sexually active and 30 (51.7%) of them had two or more than two sexual partners in the last 12 months. Nine (15.5%) students who had an experience of substance use, when asked if they had been in other risky sexual activities, they mentioned group-sex (sexual activity involving at least three people at the same time; this can include straight, bisexual and homosexual groups) at least once. Six (10.3%) out of 58 university students had experienced sexually transmitted infections in the past 12 months. Lastly, 16 out of 58 (27.6%) university students had previously been tested for HIV.

Descriptive analysis of using the various illicit drug types divided by gender is shown in Table 4-2, in detail.

Table 4-2 Type of drug use reported by university students who have acknowledged ever using drugs (n=58)

Drug types	Male		Female		Total		Male vs. female *P*-value
	N	CI 95%	N	CI 95%	N	CI 95%	
Cannabis (grass)	38	74.5 (60.8-86.3)	5	71.4 (42.9-100)	43	74.1 (62.1-84.5)	0.86
Crystal methamphetamine	6	12 (4-20)	0	-	6	10.7 (3.6-19.6)	-
Cocaine	9	19.1 (8.5-31.9)	1	16.7 (0-50)	10	18.9 (9.4-30.2)	0.88
Hallucinogens	15	30.6 (18.4-44.9)	1	16.7 (0-50)	16	29.1 (16.4-41.8)	0.47
Ecstasy (MDMA)	3	6 (0-14)	0	-	3	5.4 (1.8-12.5)	-
Heroin (crack)	3	6 (0-14)	1	16.7 (0-50)	4	7.1 (1.8-14.3)	0.33
Injecting drugs	1	2 (0-6.1)	1	16.7 (0-50)	2	3.6 (0-9.1)	0.07
Other stimulant	10	20 (10-32)	1	20 (0-60)	11	20(9.1-30.9)	1.00

Opium	5	10.2 (2-18.4)	0	0	5	9.1 (1.8-18.2)	-
Other Drugs*	13	26.5 (14.3-40.8)	0	0	13	24.1 (13-35.2)	-

*** Ketamin, kook, ayahausca, morfin, acid (LSD), magic mushroom s(hallucinogenic), krokodail (opium derivative)**

4.1.1.2 University students who had sexual activity engagement experience

When asked about their sexual behaviours, 144 (36.7%) participants stated that they had a sexual engagement within the past 12 months and 248 (63.3%) stated they had not engaged in sexual behaviours. Out of 392 respondents, 114 (29.1%) reported having vaginal sex in the last 12 months. Eighty-nine of 392 participants (21.9 %) reported having anal sex, and 107 (21.9 %) reported having oral sex within the last 12 months. In addition, 17 (4.3%) had had a sexually transmitted infection within the last twelve months.

To calculate the unprotected sexual practices, the questionnaire was designed to obtain quantitative data on condom use during penetrative sex. The data were analysed and the unsafe sexual activity was defined as at least two of the three types of vaginal, anal or oral sexual penetration in their last sexual activity. Out of 392 respondents about 26.3% did not use a condom in their last sexual penetration. As shown in Figure 4-3, significantly more male than female university students had used a condom in their last sexual penetration.

In addition, out of 392 respondents, 62 (16.1%) reported having sex with two or more than two partners, and 45 (11.5%) had sex with three. or more than three, partners in the last 12 months. Males also had more

multiple sexual partnerships in comparison to females and this was statistically significant.

Out of 392 respondents, 34 (8.7%) of the university students surveyed had sex with sex workers (male students) or a person with multiple partners (female students) at least once in their lifetimes Ninety-seven (24.7%) respondents had been in a sexual activity without knowing their partners very well.

There was an open-ended question at the end of section 2 on the questionnaire for students who had sexual experience, which asked if university students had any other risky sexual behaviour within the last twelve months; 20 out of 392 (5.1%) had responded “Group-sex” and the rest of students did not mention any specific activity. It was important to mention that group sex, abbreviated as GS, was called a sexual activity when more than two people engaged in it, and this can include straight, lesbian and gay groups. Because this number was significant, group sex activity was considered as one of the main variables to be analysed. Significantly, all the respondents with an HIV test-taking history had experience of sexual engagements over their lifetimes (P=0.000).

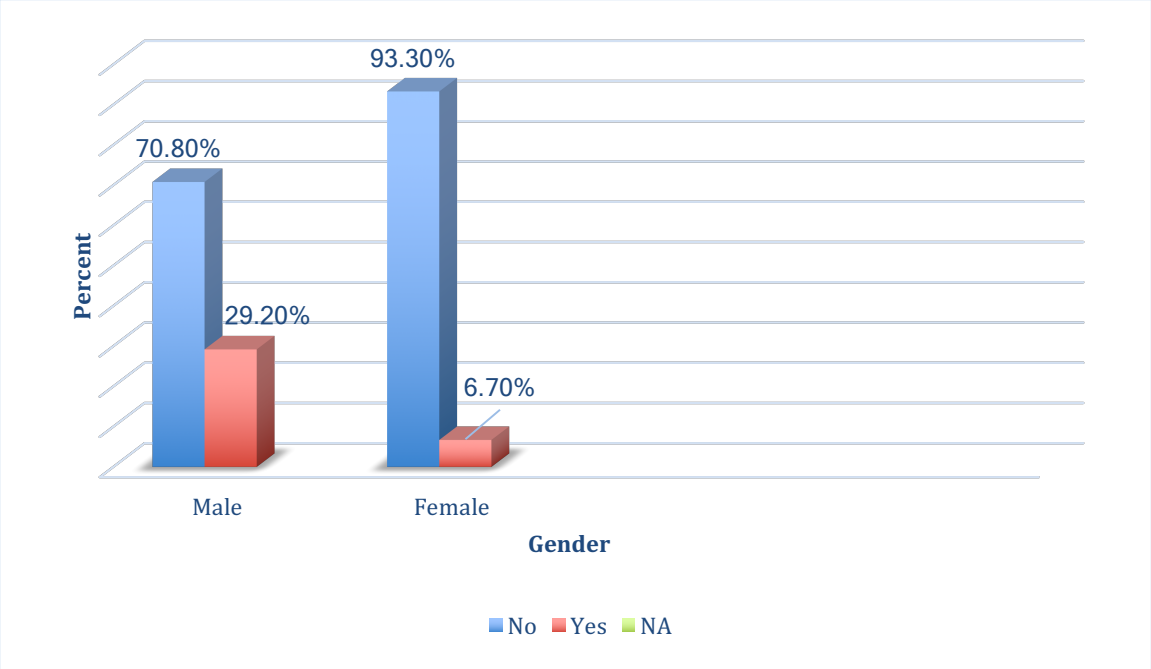

Figure 4-3 Male and female university students who had unprotected sexual penetration in their last sexual activity

Among the 144 university students having sexual activity in the last 12 months, 68 (47.2%) were aged 22 or younger. In addition, 107 (74.3%) were male, 37 (25.7%) were female, and 120 (83.3%) were single. Also, 17 (11.8%) had had STIs in the last 12 months.

Sixty-three (44.1%) individuals with who had experienced sexual contact in the last 12 months had more than one sexual partner (P=0.000), while 70 (48.7%) of them had two or more sexual partners in the last 12 months,

Out of 144 students with sexual activity, 37 (25.7%) had experienced having an HIV test taken.

In addition, 51(35.5%) had a drug use experience at least once and 76 (52.8%) had experienced a drug party and 20 (14.8%) have had a group-sex experience.

When examining sexual penetration and safe sex practices 103 (71.5%) among those who had ever had sexual activity had used a condom during the last penetrative sex with their partners.

A descriptive analysis of the characteristics of sexual behaviour divided by gender among university students who had sexual activity experience is shown in detail in Table 4-3.

Table 4-3 Sexually-related behaviours reported by the university students who acknowledged sexual acts (n=144)

Sexual behaviours	Male		Female		Total		Male vs. Female P-value
	N	CI 95%	N	CI 95%	N	CI 95%	
Number of partners in the last 12 months							
1	51	47.7 (37.4-57)	29	80 (66-91.7)	80	55.9 (48.3-64.3)	0.002
2	15	14 (7.5-20.6)	3	8.3 (0-19.4)	18	12.6 (7.7-18.2)	
3+	41	38.3 (29-47.7)	4	11.1 (2.8-22.2)	45	31.5 (23.8-39.2)	
Ever had vaginal sex	90	85.7 (79-92.4)	24	72.7 (57.6-87.9)	114	82.6 (76.1-88.4)	0.08
Ever had anal sex	72	68.6 (58.1-78.1)	14	45.2 (25.8-61.3)	86	63.2 (55.1-71.3)	0.01
Ever had oral sex	84	80 (71.4-87.6)	23	74.2 (58.1-87.1)	107	78.7 (71.3-86)	0.48
Had vaginal condom use in the last sex	59	58.4 (48.5-68.3)	14	45.2 (29-61.3)	73	55.3 (47-63.6)	0.19
Had anal condom use in the last sex	32	32.7 (23.5-41.8)	4	14.8 (3.7-29.6)	36	28.8 (21.6-36.8)	0.07
Had oral condom use in the last sex	6	5.9 (2-10.8)	3	10 (0-23.3)	9	6.8 (3-11.4)	0.43
Ever had sex with sex workers (male). Having sex with someone who had been in various sexual activities (female)	23	21.7 (14.2-30.2)	11	30.6 (13.9-44.4)	34	23.9 (16.9-31)	0.28
Had condom use in the last sex. Having sex with sex workers (male). Having sex with	20	76.9 (61.5-92.3)	5	41.7 (16.7-66.7)	25	65.8(50-81.6)	0.03

someone who had been in various sexual activities (female)							
Being in sexual activity without knowing the sex partner	83	77.6 (69.2-85)	14	38.9 (22.2-55.6)	97	67.8 (60.1-74.8)	0.00
Using condoms during the sexual activity without knowing the sex partner	42	45.2 (35.5-54.8)	9	31 (13.8-48.3)	51	41.8 (32.8-50.8)	0.17
Having group-sex*	18	17.5 (10.7-25.2)	2	6.3 (0-15.6)	20	14.8 (8.9-20.7)	0.11
Ever had STI**	12	11.3 (5.7-17.9)	5	13.9 (2.8-25)	17	12 (7-17.6)	0.68
Ever had STI treatment	4	4.1 (1-8.2)	4	13.3 (3.3-26.7)	8	6.3 (2.3-10.9)	0.06
*** This sexual activity involves at least three people at the same time, this can included straight, bisexual and homosexual groups **Sexually transmitted infection**							

4.1.2 Inferential statistics findings

4.1.2.1 Factors associated with substance use

The univariate and multivariate logistic regression analyses were conducted using SPSS software to identify the factors associated with any illicit drug use among university students. The variables, which had significant correlations with high-risk behaviours in the present study or the variables, were significantly correlated in other studies have been used in multivariate analysis and are shown in Tables 4-4 and 4-5. Only variables that were found to be significantly associated with substance use in univariate analysis at the 5% level were included in the multiple logistic regression models to identify the factors independently associated with any drug use.

Table 4-4 identified factors associated with engaging in substance use among university students who participated in this study component. Use of a substance was an outcome defined as survey participants who reported ever using any type of illicit drugs.

As a result, the students who reported knowing that students who used drugs were less likely to be engaged in substance use (OR=13.18; 95% CI (4.66-37.21)).

Demographic variables, such as gender and age, were not significantly associated with substance use among university students in the present study. Having unprotected sexual activity or other related high-risk sexual behaviours were also not associated with substance use in this group.

However, there was very strong evidence of a relationship between attending a drug party and substance use; moreover, having friends who were using drugs was significantly associated with substance use among university students. Furthermore, the relations between being sexually active in the last 12 months and using substances in university students were significant.

Some questions, such as going to drug party or having friends who use drugs, are verified questions that could be related to high-risk behaviours amongst Iranian students. These variables were significantly related with using illicit drugs; therefore, they were considered in the multivariate model.

University students who have been at a drug party were using drugs 3.78 times more than other students. It was also possible that university students who had a friend with drug use experience used drugs six times

more than those who did not have friends with drug use experience. In addition, the probability of using drugs among university students who reported sexual activity in the past twelve months was about 9.35 times more than for other university students.

Table 4-4 Percentage and predictors of drug use among different sub groups of university students in Tehran (n=392)

Subgroups	N (%)	Crude OR (95% CI)	Adj. OR (95% CI)
Gender **Female** **Male**	7(12.1%) 51 (87.9%)	**Reference** **6.30 (2.78-14.30)**	***NP***
Age **22 years or younger** **More than 22**	31(53.4%) 27 (46.6%)	**Reference** **2.85 (1.6-5.07)**	***NP***
Knowing any student using drugs **No** **Yes**	4 (6.9%) 54 (93.1%)	**Reference** **13.18 (4.66-37.21)**	***NP***
Participating in any drug parties **No** **Yes**	14 (24.1%) 44 (75.9%)	**Reference** **12.29 (6.36-23.73)**	**Reference** **3.78 (1.73-8.26)**
Having any friends to use drugs **No** **Yes**	5 (8.6%) 53 (91.4%)	**Reference** **20.45 (7.95-52.59)**	**Reference** **6.00 (2.13 -16.93)**
*** Being sexually active in last 12 months** **No** **Yes**	8 (13.8%) 50 (86.2%)	**Reference** **21.58 (9.80-47.52)**	**Reference** **9.35 (4.01-21.08)**
****Unsafe sex** **No** **Yes**	35 (68.6%) 16 (31.4%)	**Reference** **1.82 (0.82-4.05)**	***NP***
*****Overall having high-risk sexual partner** **No** **Yes**	13 (25.5%) 38 (74.5%)	**Reference** **1.15 (0.53-2.50)**	***NP***
******Unsafe sex with high-risk sexual partner** **No** **Yes**	31 (68.9%) 14 (31.1%)	**Reference** **1.82 (0.82-4.05)**	***NP***

*****Group-Sex No Yes	 39 (81.3%) 9 (18.8%)	 **Reference** **1.59 (0.60-4.17)**	 ***NP***
HIV test **No** **Yes**	 38 (70.4%) 16 (29.6%)	 **Reference** **3.22 (1.64-6.33)**	 ***NP***

* Students who have ever sexual experience in the last 12 months. **Students who have not used condoms in the last sex (at least two of the three types of vagina, anal/or oral sex). *** Students who have ever had sex with sex-workers or unknown partners (partners with unclear sexual activity background). **** Students who have not used condoms in sex with their high-risk partners in their last sex activity. *****Students who have ever had sex activity that involves three people (threesome) or more one at the same time.

4.1.2.2 Factors associated with not using condoms at the last sexual relationship (unsafe sex)

As previously explained, the questionnaire was designed to obtain quantitative data on condom use during penetrative sex (for at least two of the three types: vagina, anal or oral penetration) in the last sexual activity the respondents were able to remember clearly.

The univariate and multivariate logistic regression analyses were used to estimate the crude and adjusted odds ratio (OR, 95% confidence interval), using SPSS software, to identify the factors associated with unsafe sex or unprotected sexual activity among university students in Tehran. The variables found to be significantly associated with unsafe sex in univariate analysis at the 5% level were included in the multiple logistic regression models to identify the factors independently associated with unsafe sex. In addition, there were few significant correlations between the variables for males versus females with high-risk behaviours so, due to the small number of unsafe sex behaviours for both males and females, we combined the males and females together in the multivariable analysis.

Not using a condom in the last sexual penetration in this study was an outcome variable categorised as participants who reported not using a condom during their last sexual penetration. Multiple sexual partnerships

were also defined as respondents reporting any type of sexual penetration (oral, vaginal or anal) with more than one individual within the last 12 months.

Demographic variables, such as age and gender, were not significantly associated with unsafe sex among university students in Tehran. Interestingly, being in a drug party and having group sex were also not significantly associated with students who had been involved in unsafe sex. In addition, from the multiple logistic regression analyses, there were no statistically significant descriptive factors associated with unsafe sex. There were no statistically significant differences in unsafe sex by gender or age. Moreover, among the independent variables tested, none were found to have significant relationships with the dependent variable. Engaging in group sex, either by being in a drug party, as well as being tested for HIV, was not associated with having unsafe sex. Table 4-5, below identifies factors associated with engaging in unsafe sex.

Table 4-5 Percentage and predictors of unsafe sex* (no condom use) among different sub-groups of university students in Tehran (n=392)

Subgroups	N (%)	Crude OR (95% CI)	Adj. OR (95% CI)
Gender			
Female	28 (27.2%)	**Reference**	***NP***
Male	75 (72.8%)	**5.78 (1.29-25.78)**	
Age			
22 years or younger	54 (52.4%)	**Reference**	***NP***
More than 22	49 (47.6%)	**1.03 (0.47-2.27)**	
Number of partners			
1	60 (58.3%)	**Reference**	***NP***
2	12 (11.7%)	**2.30 (0.73-7.28)**	
3 or more	31 (30.1%)	**2.08 (0.87-4.97)**	

Knowing any student use drugs **No** **Yes**	24 (23.3%) 79 (76.7%)	**Reference** **1.71 (0.59-4.88)**	***NP***
Participating in any drug parties **No** **Yes**	51 (49.5%) 52 (50.5%)	**Reference** **1.96 (0.86-4.45)**	***NP***
Having any friends using drugs **No** **Yes**	37 (35.9%) 66 (64.1%)	**Reference** **4.06 (1.32-12.45)**	***NP***
Group-Sex **No** **Yes**	82 (84.5%) 15 (15.5%)	**Reference** **1.05 (0.34-3.17)**	***NP***
HIV test **No** **Yes**	72 (73.5%) 26 (26.5%)	**Reference** **1.05 (0.41-2.67)**	***NP***

* Students who have not used condom in their last sex (at least two of the three types of vaginal, anal or oral sex)

4.2 Conclusions

In this chapter, the details of the demographic characteristics of the respondents' high-risk sexual behaviours, as well as substance use in university students, were outlined by descriptive and deduced findings. Inferential testing was then carried out using IBM SPSS statistical analysis software, version 21 with the significance level of statistical tests fixed at 0.05. Logistic regression analyses were conducted to assess the demographic characteristics associated with the following dependent variables, each of which contributed to an increased risk of HIV and sexually transmitted acquisition and infection: a) Any substance use; and b) Unprotected sexual activity (unsafe sex). Items significant at $P<0.05$ were included in the final multiple logistic regression model.

Noticeably, some students exhibited experience of using illicit drugs and an alarmingly high proportion of students were not using condoms when engaging in sexual practices.

The next chapter includes the qualitative study's findings about the prevalence of STI, high-risk sexual behaviours and substance use among university students from the standpoint of some experts who had close interactions with the target group of this investigation.

CHAPTER FIVE

5. QUALITATIVE STUDY FINDINGS

5.1 Introduction

This component of the study presents findings from the participants in the qualitative study.

In this chapter, after data extraction and analysis of the interviews, the findings were categorised and the themes revealed. Consequently participant's responses were divided in two categories: a) illegal drug use and the consequence of drug use among university students; and b) high-risk sexual behaviours and prevalence of STIs. Finally, the participants gave their recommendations to provide appropriate promotions of sexual health for university students.

5.2 Study findings

Thirteen semi-structured interviews were undertaken with key informants. The participants' characteristics are presented in Table 5-1.

In addition, three main categories were formed: drug use status among university students in Tehran, different types of drug use in university students, and sexual behaviours among university students (Table 5-2).

Table 5-1 Participants' characteristics

	No
Occupation	
University students' counsellors and mentors	4
Specialists in a counselling centre for the reduction of high-risk behaviours	2
General practitioners	3
Specialists in infectious diseases	4
Gender	
Male	6
Female	7

Table 5-2 Themes, categories and codes extracted from expert individuals' perceptions about high-risk behaviours related to HIV/STI among university students

Theme	Categories	Codes
High-risk behaviours related to HIV/STI among university students	Drug use status	Increasing of substance use
		Using cannabis (grass, marijuana) is increasing
		Using amphetamine and crystal-meth (methamphetamine) is increasing
		Using cocaine is increasing
		Using ecstasy (MDMA) is increasing
		Using heroine (crack) is increasing
		IDU (intravenous drug users) is increasing
		Using opium (teryak) is increasing
	Sexual behaviours among university students	Increasing of risky sexual behaviours
		Increasing of unsafe sexual activity
		Increasing of STIs
		Increasing other high-risk sexual behaviours: concurrent or multi-partnerships, sex with commercial sex-workers, homosexuality and bisexuality and group-sex

5.2.1 Drug use status among university students in Tehran

5.2.1.1 Extent of substance use among university students

Most of the participants agreed that drug usage was common among university students, specifically, in males. Moreover, some participants stated

that the use of substances was very popular with students living in dormitories.

"Using drugs is prevalent among university students who are living away from their home and families. Students are considered one of the most vulnerable groups of society. The students living in dormitories are prone to drug abuse due to the lack of parental supervision and the impact of peer pressure." (No.3 Specialist in a counselling centre for reduction of high-risk behaviours)

"Undoubtedly, in dorms most of students had the experience of using drugs at least one time; dormitories cannot be a safe place since students can teach each other how to use drugs. The worst part is students are competing to use drugs, and they suppose it is a heroic act" (No.4 Specialist in infectious diseases)

5.2.1.2 Different types of drug used in university students

Cannabis, crystal methamphetamine, cocaine, hallucinogens, ecstasy (MDMA), heroin (crack), injecting drugs, other stimulants and opium use were asked from the participants as the main common substances used. Table 5-3 below, categorised the answers of participants related to the different types of drugs common with university students.

Table 5-3 Common type of drugs among university students in Tehran from the viewpoints of experts

Type of drugs	No. of agreed participants	No. of disagreed participants	No. of participants with no idea
Cannabis (grass, marijuana)	10	-	3
Amphetamine AND crystal-meth (methamphetamine)	8	3	2
Cocaine	2	-	11
Ecstasy (MDMA)	1	-	12
Heroine	1	3	9
IDU (IV drug user)	-	7	6
Opium	5	-	8

Ten participants mentioned that cannabis (called grass, in Iran) was the commonest drug among university students. Furthermore, eight of the participants expressed that students preferred to sniff drugs instead of using injections or other kinds of use.

"Grass is first choice to use in universities. Today it is used normally l ike cigarette." (No.8 General Practitioner)

Eight participants stated that methamphetamine (called shisheh in Iran) had recently been the main cause of the increasing HIV and STI transmission in young Iranian individuals, mainly among young university students.

"Since crystal meth is very cheap in Iran, it would be affordable for students to buy." (No. 2 Specialist in infectious diseases)

"Male university students are using crystal meth because it gives them courage to present themselves like a hero and female

students are using methamphetamine to lose weight and get thin." (No.1 Specialist in a counselling centre for reduction of high-risk behaviours)

Only two participants emphasised the use of cocaine among university students.

"Wealthy students can use cocaine, because cocaine is very expensive, and only the rich students can provide and use cocaine in Iran". (No.7 General Practitioners)

One participant mentioned that heroin (called crack in Iran) has recently come back as a common drug in university students, although it was still not very common.

Fewer than half of the participants (five out of 13) agreed that many university students used opium regularly, and also that opium was the most prevalent substance in university dorms.

"Most of my clients are opium addicted even in high level of education like doctorate level and also medical students." (No.5 Specialist in infectious diseases)

Reasons of drug use in university students from the participants' standpoints:

Several reasons for drug use in university students were presented in this study by participants, including: a) increasing concentration and energy; b) misconceptions about not become addicted by using illicit substances; and c), increasing sexual pleasure especially by using methamphetamine.

As one of the specialities in infectious disease (No.5) mentioned, *"After using drug, sexual arousal (Phase-1 of sexual activity) is become prolonged during penetration, that's why, sex parties are mostly started by using drugs."*

5.2.2 Sexual behaviours among university students

5.2.2.1 Extent of risky sexual behaviours among university students

Almost all participants believed that the prevalence of risky sexual behaviours has been increasing over the last decade in university students.

> *"The number of sexual engagement and risky sexual behaviours is about three times more than before; it is a warning that HIV tsunami (big outbreak) is coming very soon." (No.3 Specialist in a counselling centre for the reduction of high-risk behaviours)*

> *"Students are following their peers blindly, since they are afraid to get isolated or ridiculed by others. They go to the parties and do whatever their friends do." (No.1 Specialist in a counselling centre for the reduction of high-risk behaviours)*

> *"It is important to note that a risky sexual manner is very possible in university students because after deprivation from the opposite sex in schools, university gives them this opportunity to start experiencing sex." (No.11 university students' counsellor and mentor)*

5.2.2.2 Unsafe sex (unprotected sexual activity) among university students

Ten participants mentioned that university students were unwilling to use condoms in their sexual engagements. They did not believe in using condom as protection and they did not take condom use as seriously as they should. Only one participant *(No.4 Specialist in infectious disease)* agreed that students used protected sex regularly.

> *"There are several misconceptions about using condoms among students which they are reluctant to use it constantly. They believe that condoms reduce their sexual pleasure, and also they believe that sex without condoms is athletic act and present them as hero." (No.1 Specialist in a counselling centre for the reduction of high-risk behaviours)*

Some participants believed that female students were not willing to suggest condoms use in sexual engagement.

> *"In Iranian culture, offering condoms from the females' side is interpreted as a disease in males or mistrust." (No.1 Specialist in a counselling centre for reduction of high-risk behaviours)*

Half of the participants stated that condoms were mostly used for birth control not as a protection against HIV and STIs.

“Although medical students have been taught about safe sex and they definitely know the consequence of unprotected sexual activity, they do not use condoms as protection” (No.6 Specialist in infectious diseases)

“Students easily accept unprotected sex, since they wrongly think HIV is far away from them.” (No. 9 General Practitioners)

Reasons of having unsafe sex in university students from the participants’ standpoints:

Participants pointed out some reasons, which included (in order of importance): misconceptions about protection against STIs; changes made in new generations’ moral values and social worth; fear of talking about sex; no sex education or late sex education and substance abuse. In addition, there was a misconception about the way to get HIV and other STIs was been mentioned by most experts.

Besides, stigma and disgrace about sexual activity were the main reasons that provoked university students to have high-risk sexual behaviours. Having sexual engagement had a stigma and it was a big issue in developing societies like Iran. Therefore, one of the predominant reasons that pushed students into risky sexual behaviours was being afraid to talk about their sexual matters.

“Students reluctant to talk about their own sexual issues, even when they had risky sexual behaviours and come to clinic to do HIV test

almost always they pretend that a needle stick happened for them." (No.5 Specialist in infectious diseases)

5.2.2.3 Different opinions about STIs among university students

In this component, there were different opinions about the prevalence of STIs, especially HIV, among university students.

Almost all participants believed that the frequency of HIV as well as STIs in university students was not high; however, it was very likely it will increase over the following years. In particular, HIV had rarely been seen by the participants among their clients.

"Fortunately, I haven't seen HIV infections among university students so far but there are many genital herpes, warts and fungi among them." (No.1 Specialist in a counselling centre for the reduction of high-risk behaviours)

Some of the participants believed that many university students were afraid of sexually transmitted infections, although they rarely had information about these diseases.

"University students come to my clinic, and explain some signs of sexually transmitted infections to get medication, because they are frightened of HIV and hepatitis. Unfortunately, they rarely have any information about other STIs." (No.5 Specialist in infectious diseases)

5.2.2.4 Other high-risk sexual behaviours

Almost all participants expressed that there were other sorts of risky sexual behaviours among university students including multi-partnerships or

concurrent sex with commercial sex-workers, homosexuality and bisexuality and group-sex.

Concurrent or multi-partnerships

Eleven of the participants expressed that multi-partnerships (having more than one sexual partner at the same time) or concurrent sexual partnerships (overlapping sexual relationships with more than one person at the same time) were increasing dramatically among university students.

> *"Multi-partnership is considerably increasing through the last decade, predominantly in male students between the age of 20 to 25. (No.8 General Practitioners)*

> *"During recent years, the moral boundaries are declining about concurrent sexual relationship among young students." (No.1 Specialist in a counselling centre for the reduction of high-risk behaviours)*

Sex with commercial sex-workers

Eight of the participants believed that having sex with commercial sex-workers was becoming common in male university students.

> *"I have seen some university students who pay for a sex worker as a birthday gift for their friends." (No.6 Specialist in infectious diseases)*

> *"Some students come to the clinic after having sex with sex-workers and they are concerned about HIV infection." (No.4 Specialist in infectious diseases)*

Whereas, having sex with sex workers among university students was disapproved of by four participants.

> *"Having sex with sex workers is not affordable for university students who are not earning money and are living with their parents." (No.13 General Practitioners)*

Homosexuality and bisexuality

Eight participants mentioned that there was a growth in homosexuality (romantically or sexually attracted to people of their own gender) and bisexuality (sexual attraction or sexual behaviour towards both males and females) among university students these days.

> *"Homosexuality is more common in female students than male students because of some restrictions like keeping the virginity before marriage, so female students, particularly in dormitories, are willing to try this sexual behaviour." (No.10 General Practitioners)*

> *"University students have recently enhanced their knowledge about homosexuality and they have started to express their sexual intimacy without fear and shy." (No.3 Specialist in a counselling centre for the reduction of high-risk behaviours)*

Bisexual activities were also increasing among university students. Most participants explained that bisexuality was even more common than homosexuality.

“One of my clients mentioned that he had a sexual engagement for at least six years with an opposite sex partner, and then he started sexual activity with same sex partner, just because he wanted to try a new type of sexual entertainment and pleasure.” (No.12 General Practitioners)

Group sex

Group sex is a sexual activity that involves at least three people at the same time; this can include straight, bisexual and homosexual groups.

When asked if there were any other high-risk sexual behaviours among university students, 11 participants responded by saying group sex, particularly in male students. Most of the participants had several clients who had been in a group sex sessions or who had exchanged partners with their friends.

“I suppose group sex is not a scarce sexual behaviour in university students these days.” (No.2 Specialist in infectious diseases)

“Exchanging partners and having threesome (sexual activity that involves three people at the same time) mostly two males and one female is very common in young students.” (No.1 Specialist in a counselling centre for the reduction of high-risk behaviours)

"I had a client; she had sex with 14 male students after using a stimulant in a party." (No.4 Specialist in infectious diseases)

Reasons for having group-sex in university students

Some of the participants pointed out that amphetamine was the main reason for group sexual activity. In the last decade, participating in group-sex had increased dramatically, particularly in some types parties, which were known as a drug party or a sex party.

Certainly, using amphetamine and other substances would be a reason for group-sex among university students. Since, after using drugs like a hallucinogenic even if they knew about safe sex they cannot do it properly. Moreover, sex with drugs was exciting as well as addictive, also stimulants increased sexual intimacy and, therefore, it would be irresistible to be used repeatedly during sexual activity, after trying it once.

Over the last decade young individuals used stimulant substances more than opium, which they had used previously. These stimulants made sexual activities more pleasurable. Therefore, after the increase in crystal meth and amphetamine use in university students, sexual penetration was rising out of control and was it also unprotected.

Why university students don't like to be asked by the new partner about their previous sexual activities? Or, why they don't like to talk about STI, HIV, and condom with their sexual partners?

These were critical questions which the participants explained during the interviews. The main reason was cultural issues, which made these

questions unusual. Both males and females were not willing to talk about their previous sexual activities. In Iranian culture asking any questions about someone's sexual activities was taboo since having sex with several individuals was not respectful. In addition, because of very limited information about HIV/STI, some participants pointed out that HIV or STIs cannot be a good reason for not engaging in sexual activity for young and greedy students.

Overall, university students did not ask about the sexual background of their partners, they would like to dive into sex without any questions.

"Mostly university students start their sexual activities totally blind." (No. 5 Specialist in infectious diseases)

5.3 Conclusions

Sexually high-risk behaviours, as well as using illicit substances, were on the rise in university students. The people who have close interactions with this group described the critical situation of STI and HIV infections that may occur among young university students in the near future.

The factors that put university students at risk of STI and HIV infections were first related to the lack of education and then cultural and religious issues in society. In order to reduce high-risk behaviours among university students it was imperative that education and information about STI and HIV, condom use, and the consequences of using drugs, be readily available and easily accessible to this group.

The next chapter also includes a discussion about the importance of designing targeted interventions that were comprehensive in scope and effectively addressed the knowledge/behaviour gap.

The plan for the following chapter is to perform a general discussion to compare the quantitative and qualitative results; the statistical data from the previous literature will also be explored and discussed in the next step. Lastly, the suggestions and implications for the researcher+ will complete the general discussion.

CHAPTER SIX

6. IMPLICATIONS OF THE RESEARCH FINDINGS AND GENERAL DISCUSSION

6.1 Introduction

The two previous chapters analysed the findings from both the quantitative and qualitative studies. This chapter applies a general discussion of these two study findings as well as the previous literature, as noted in Chapter 2. The potential theories discussed in this chapter address the study aims.

6.2 Comparing the findings of the two studies and a general discussion

The results from this mixed method study highlighted points related to high-risk sexual behaviours and substance use among university students in Tehran. These findings were categorised into the main aims of this mixed method investigation.

The following paragraphs discuss the results of high-risk sexual behaviours and substance use among university students in Tehran, extracted from both the quantitative and qualitative studies, and compares the relevant findings extracted from the previous literature worldwide.

Aim-1 *To explore high-risk sexual behaviours among university students in Tehran*

High-risk sexual behaviours have various definitions in different fields of studies. However, in the present study, risky sexual behaviour was

defined as the type of behaviours associated with sexually transmitted infections (STI) and HIV. It is important to mention that not using protection during sexual penetration was defined as unsafe sex, which is a highly risky behaviour related to STIs, including HIV.

In developed countries, public health systems controlled risky sexual behaviours adequately. Advertising about condoms and safe sexual activity in the developed world, like in Australia, was the main reason for the reduced growth of HIV infections. Although HIV, as well as STIs, have not been eradicated in these societies, the knowledge and attitudes of people were on a level to protect them from these diseases.

However, in the developing world the knowledge of safe sex and using condoms was very limited. In addition, the number of HIV infected patients was increasing uncontrollably. Moreover, the Middle East was one of the regions where the awareness of unsafe sex, using protection and condoms had not been undertaken appropriately, therefore HIV and STI infections were still on the rise in this region.

The results in the quantitative study revealed that about 144 respondents have had sexual activity within last 12 months, almost 82.6% had vaginal sex; 63.2% had had anal sex and 78.7% had had oral sex. Specifically, 55.3% of students had used a condom in their last vaginal sex, 28.8% had used protection i their last anal sex, only 6.8% had used a condom in their last oral sex.

In regard to the definition of unsafe sexual activity in the present study (not using condom on the last sexual penetration and at least two of the

three types of vagina, anal or oral sex), about 26.3% of the total university students did not use condoms on their last sexual penetration.

In the quantitative component the university students' responses showed that they were not using condoms regularly, specifically, for anal and oral penetration.

The statistical findings confirmed the responses in the qualitative study component. When interviewed, most participants expressed that university students were unwilling to use condoms regularly and they may use them only as a contraceptive device. They represented several proofs that university students did not follow protected sexual activity.

As discussed previously in the qualitative study, numerous students were reluctant to use condoms since condoms reduced their sexual pleasure. Most students believed that asking to use a condom was offensive and, if they suggested a condom, it will be interpreted that their partners were not healthy or trustworthy. Furthermore, there was some evidence that students did not know how to use condoms correctly. Moreover, some of them did not use condoms for anal sex because they supposed that condoms were just for birth control. However, HIV can be transmitted by anal sex more than vaginal sex while, under some conditions, HIV was also able to be transmitted by oral sex. In addition, because of the lack of knowledge students were not asking sexual questions and sometimes they were also embarrassed to use word condom, so purchasing condoms would likely be a huge issue.

In comparison, fewer than half of Neapolitan university students were using condoms in their sexual activities. (99) Whereas, in Ethiopia, 32.7%

of university students had used a condom during sexual penetration, (102) In the Chinese university students surveyed, barely 35% had used a condom in their last sexual activity. (101) Therefore, consistent condom use among students studying at universities in Tehran was lower than for university students in countries with the same socio-economic situation. The lack of information and education about sexual issues as well as protected sexual activity on one side and sex as a taboo in the society on the other side, were the two reasons that affected the findings strikingly.

Although unsafe sex was a very crucial variable in the quantitative analysis, it was not statistically significant. Students were probably not able to answer questions related to their sexual behaviour, correctly or freely. They believed sexual activity was a sin and they will be criticised if they answered, Yes, to those questions related to sexual issues.

Surprisingly, even in medical students who studied STIs and HIV and protected sexual activity at medical schools, a low level of condom usage has been reported.

To further heighten the risk, many students were not aware of all the risks associated with HIV or STI transmission (such as having unprotected oral and anal sex).

Many university students in Tehran practised unprotected oral and anal sex, because a significant proportion of this population was not aware that oral and anal sex can increase the risk of HIV transmission, and they supposed these sexual penetrations were not as hazardous as penetrative vaginal sex.

However, by engaging in unprotected sex practices (oral or otherwise), they were often (unknowingly) putting themselves at risk for transmitting HIV/STI.

In Iran, from the elementary level of education, boys and girls go to separated schools and, after completing 12 years of education, they meet each other at universities. This long time of deprivation from the opposite sex created much curiosity about women for these young students.

In addition, young people in all nations would like to follow their friends; they wanted to be in centre of attention and, therefore, having risky behaviours made them a hero in front of their peers. These behaviours became extreme when some students from other cities inhabited dormitories or shared houses with their friends. This would be hazardous when there was not any accessible or reliable source of information about sexual health. Since there was internet filtering for some words, such as condom, sex and other sex-related words so students were not able to find any information about sexual health by searching the internet (googling). Furthermore, there was no advertising for sexual health or sexual protection information in the media or any specific educational courses at schools or universities to restrain students from having unprotected sexual activity. Because they did not have access to that kind of information many students were putting themselves and their partners at risk of HIV/STI transmission.

If the media in Iran which reached the majority of Iranian citizens continued to ignore high-risk sexual behaviours and the existence of HIV it

ran the risk of fuelling the HIV epidemic rather than working towards halting infection rates in Iran.

It was encouraging to note that Iran is a religious society in which sexual abstinence is going to diminish gradually as the restricted atmosphere in Iran thrust young people into sexual activity blindly. Moreover, there has been little research carried out in the area of sexual behaviours in Iran. The only confirmed data, which was reported by the government in 2006, estimated that 74.3% of high school students in Iran had unofficial sexual relationships. In addition, 80% of high school females in Tehran had had sexual activity at least once in the last 12 months. (38) This can be a critical situation for a traditional society like Iran. Noticeably, this crucial phase needed more investigation and research. However, several limitations around sexual issues were barriers that turned sexual investigation into very complicated research.

Therefore, high-risk sexual behaviours among university students did not give a simple or unidirectional picture; rather, it was a dynamic interplay of culture, society's values and gender that helped us to gain a clearer understanding of this problem.

Iran's cultural roots were founded in traditional views and customs with society at large promoting steadfast concepts and ideas in terms of what was expected of its inhabitants. Individuals who lived in this country were expected to get married with a virgin partner and having sex before marriage was strongly discouraged. However, given modernity and a large influence from the west, these expected cultural norms were constantly being called into question. This shift and uncertainty has led to

the increase in STIs, including HIV transmission rates, among the population.

Safe sex and HIV/STI prevention was seen as a community problem requiring cooperation and collaboration from policymakers. However, policymakers were spending more time on limiting sexual engagement among young people than providing educational resources for them. (157, 158) That is why Iran had restrictions on providing safe sex educational programmes to promote and foster the health and well-being of its inhabitants. The lack of adequate knowledge and the attitudes towards STI and HIV among Iranian students was further exemplified by Anahita Tavoosi (118), who expressed that in Iran evidence-based HIV/STI training and intervention programmes for youth were limited.

Aim-2 *To estimate the prevalence of STI among university students in Tehran*

Sexually transmissible infections (STI) and HIV were predominately contracted through unsafe sexual practices that can show no symptoms. (46) Nearly 25% of sexually active youths throughout the world become infected with an STI every year. (50) In Sweden, a developed country, in 2009, had a frequency of STIs among university students of 29%, (58) which was a little more than the worldwide estimation. However, in China, as a developing country, the prevalence of STIs among university students was estimated to be very low, at 1.5% (2006). (101)

In comparison, the estimated prevalence of STIs in the present study was 4.3% among university students in Tehran, while the frequency of STIs among students who had experienced sexual engagement was 12%. This was about half the worldwide estimation. Furthermore, only a few participants in the interviews specifically mentioned STIs among university students. Most of the participants in the qualitative study believed that sexually transmitted infections were not common among students. Almost all of them stated the HIV was still scarce among university students in Tehran. The only study conducted, in 2010, on the prevalence of HIV infections among medical university students by the researcher of the present study showed that there were no medical university students with HIV infections in that study. (34) Therefore, HIV cannot be a very significant infection among university students so far.

Given that STIs were increasing significantly in young populations, there had not been any systematic study among young individuals in Iran. Almost all participants in the qualitative study believed that there had been scant research done so far by health organisations in Iran to estimate sexually transmitted infections among young Iranian populations. Moreover, there has been a greater focus on HIV than other sexually transmitted infections; therefore, general knowledge about STIs was very limited. Furthermore, Iranian individuals who had not been properly informed about the modes of transmission of STIs have different beliefs about STIs, which were mostly not true.

Aim-3 *To explore the prevalence of multi-partnerships or other high-risk sexual behaviours in university students in Tehran*

It was important to shed light on university students who engaged in other risky sexual behaviours. They engaged in risky sexual practices, such as having sex with sex workers, group sex or bisexuality, and often without contraceptives.

In some of the literature multi-partnerships were defined as risky sexual behaviours, having two or more than two sexual partners in the previous year. (103) (102)

This is also defined as a sexual behaviour with three partners or more in previous 12 months. (100) In the present quantitative study as the results showed that about 44% of university students with sexual engagement have had two or more two sexual partners in the last twelve months. In comparison to Ethiopia (in 2012), nearly 33.5% had two or more than two partners in the previous 12 months.

In Uganda, (100) 46% of male students and 23% of female students had three or more than three partners while, in the present study, 38.3% of male students and 11.1% of female students with experience of sexual activity had been in sexual relationships with three or more than three partners in the previous 12 months.

In the qualitative study, most experts believed that concurrent or multi-partnerships had been increasing recently, particularly in university students. The point was that students were very proud to be engaged in

several sexual relationships and they had no idea about the consequences of these risky behaviours.

Given the current social and cultural transitions and upheavals in Iran, many students were looking for ways to have sexual activities out of marriage or legal relationships. Thus, having sex with commercial sex workers was increasing in university students, particularly as the first sexual experience.

In the present study, male students were asked if they had any sexual activity with commercial sex workers, and the female students were asked if they had any sexual engagement with someone who had a multi-sexual background. The results revealed that 23.9% of the total male and female participants with sexual experience reported having sex with sex workers/multi-partner person at least once, and during those sexual activities 65.8% did not use condoms as protection. It was clear that a limited understanding of unsafe sexual activity with STI and HIV infections, even with high-risk individuals, continued to be the major barrier to effective HIV and STI prevention in the participants. Few reports in the literature had highlighted the current state of sexual relationships with sex workers among university students.

In Ethiopia, 6.4% of the total university students mentioned having sex with sex workers at least once. In the present study 16.2% of male students mentioned having sex with sex workers at least once, and 7.7% of female students stated that they had had sex with multi-partner individuals at least once.

In the qualitative part of the research there were two different ideas; some experts agreed that male students have sex with sex workers since sex workers (street women) were accessible and easy to reach. However, other participants ignored this sexual activity among students and firmly believed that students did not have the chance to find a job to earn money while they were studying at university; therefore, having sex with sex workers would not be affordable for them.

On the one hand students have a lack of information about unsafe sex and rarely liked to use condoms as protection and, on the other hand, they put themselves in danger having sex with someone without knowing their sexual background. Among university students who had sexual experience 67.8% had not known any information about their partners' sexual backgrounds. Meanwhile, 41.8% did not use condoms with those partners so put themselves unknowingly into risky behaviours. This behaviour not only put them at risk but also put their partners at risk. Furthermore, in the interviews a large number of participants declared that university students were not willing to disclose their sexual background to their partners. Most experts believed that, in Iranian culture, talking about previous sexual relationships was offensive in front of the new partner. Therefore, students preferred to engage in unprotected sexual activity with individuals from unclear sexual backgrounds and would rather not know anything about their backgrounds if those partners appeared to be attractive or were perceived to be 'clean'; this further increased the likelihood of STI or HIV transmission.

It is worth mentioning that homosexuality is a crime punishable by imprisonment in Iran. Any type of sexual activity outside a heterosexual marriage was forbidden. Homosexual relations that occurred between consenting adults in private were a crime and Iran was one of a minority of countries where homosexual acts were still punishable by death. (159)

It has been postulated that, in a society that reinforced very strict codes and expectations about behaviours associated with that, the sexual act was complicated.

Homosexual activities were rarely mentioned in the context of HIV/AIDS in Iran.

Since homosexuality was still taboo in Iran, often one could not turn to family or friends for support and guidance. In the eyes of the Iranian government authorities and the majority of the public, homosexuals did not exist and were not given space to exist. Because of these restrictions the questionnaire in the quantitative part did not include questions that pointed out homosexuality directly; however, one open question at the end of the questionnaire, asked about other risky sexual behaviours.

Given that group sex was regarded as an unnatural practice associated with HIV/STI, 5.1% of university students in Tehran had been in a group sex situation at least once and 14.8% of students who had experience of sexual activity had also experienced group sex. Group sex was sexual behaviour involving more than two participants; therefore, some students who declared group sex in their questionnaire had engaged in sexual activities with the same sex in secret. Although they may not declare the

homosexuality directly on their questionnaires; however, they acted as bisexual people at those sexual games. Group sex was regarded as something very unnatural and shameful or, even, regarded as a disease. From this perspective, many individuals who engaged in sexual activity ignored that. According to statistical data in China, 3.4% of male university students and 2.9% of female university students were homosexual or bisexual. (101) In Ethiopia, as one of the developing countries, homosexuality was estimated at 5.7% among university students. (102) There were no public agencies in Iran to assist youth or people who were confused or questioning their sexuality. From this standpoint, many individuals were afraid to seek services and few services were provided for those who identified as homosexual or bisexual. However, it has been noted that Iranian policies tended to neglect or ignore the presence of homosexuality and administered severe punishment for it. Furthermore, they did not have access to information about protected sex, so they were at increased risk of contracting and transmitting sexually transmitted infections (STI) and HIV infection.

In addition, most of the participants in the interviews believed that having group sex was the consequence of using illicit substances. However, the quantitative findings had not found any significant relationship between using substance and having group sex. All in all, the students often hid their sexual relations because being in a sexual relationship was not acceptable in Iranian culture. All sexual relations that occurred outside a traditional, heterosexual marriage were illegal. There was confusion and conflict and virginity was of value, but only for others.

A summary of the quantitative and qualitative findings and conclusion in risky sexual behaviours among university students in Tehran, is shown in Table 6-1, below.

Table 6-1 Quantitative and qualitative findings and Conclusion in sexual risky behaviours reported by the university students in Tehran

Aims	Hypotheses	Main findings from the quantitative study	Main findings from the qualitative study	Conclusions
Aim-1 To explore sexually high-risk behaviour among university students in Tehran	Prevalence of HIV and STI-related risk behaviours in university students is increasing	**Unsafe sex estimating prevalence:** About 26.3% of total university students or 71.5% of university students, who had sexual engagement, had unsafe sexual penetration. This meant they did not use a condom on their last sexual penetration (at least on two of the three penetrative sexual activities in the last twelve months)	Almost all participants believed that university students were unwilling to use a condom during their sexual activities. They may sometimes use it as birth control in vaginal penetration but definitely they did not use it in anal and oral sexual penetrations. Although anal sex is more susceptible for HIV transmission than vaginal sex, HIV is able to transmit through oral sex too.	Although this is the only survey that has been conducted on unsafe sexual engagement in this region, it seems the prevalence of unsafe sexual activity has been increasing throughout the last decade in university students
Aim-2 To estimate the prevalence of STI among university students in Tehran	Prevalence of STI in university students is increasing	**Estimating STI prevalence:** About 4.3% of total university students or 12% of university students who had sexual engagement, have ever had an STI in the last twelve months	There were different opinions about the prevalence of STIs among university students. Half of them agreed STIs are increasing in university students. Almost all participants mentioned that HIV has been rarely seen in university students yet.	Although the frequency of STIs in this survey was not remarkable; however, it seemed the prevalence of STIs will increase in the near future, due to increasing unprotected sexual activity.
Aim-3 To explore the prevalence of multi-partners or other high-risk sexual behaviours in university students in Tehran	Prevalence of HIV and STI-related risk behaviours in university students is increasing	**Estimating prevalence of multi-partnerships:** About 44% of university students who had sexual engagement have had two or more than two sexual partners in the last twelve months	The majority of participants believed that multi-partnerships had increased considerably through the last decade. Predominantly, it was common among university student of both genders to have several sexual partners at the same time.	Although this was the first survey carried out on concurrent or multi-partnerships in the young population in this region, it was obvious that about half of the university students have had two or more than two sexual partners in the past twelve months and the qualitative results revealed this significant rise.
Aim-3 To explore the prevalence of multi-partners or other high-	Prevalence of HIV and STI-related risk behaviours in university	**Estimating the prevalence of having sexual activity with commercial sex workers in male university students:**	Most participants believed that, having sex with commercial sex-workers is gradually becoming	Sex working is not legal in Iran. However, more than 20% of male university

risk sexual behaviours in university students in Tehran	students is increasing	About 22% of male university students, who had ever sexual activity, also had sex with commercial sex-workers at least once in their lifetimes. Besides, around 23% of them have never used condom during sexual penetrations with sex workers.	popular in male university students.	students engaged in this sexual activity at least once. This can be a warning for increasing STIs, the especially frequency of HIV in this particular group in the near future.
Aim-3 To explore the prevalence of multi-partners or other high-risk sexual behaviours in university students in Tehran	Prevalence of HIV and STI-related risk behaviours in university students is increasing	**Estimating group sex* prevalence:** About 5.1% of university students, who had sexual engagement, have had sexual activity with more than one person at the same time, called "group sex".	More than half the participants in this study had several clients who have been in a group sex sessions or who had exchanged their partners with their friends at least once.	The prevalence of group-sexual activity can be conclusive evidence of increasing homosexuality as well as bisexuality among university students.
Aim-3 To explore the prevalence of multi-partners or other high - risk sexual behaviours in university students in Tehran	Prevalence of HIV and STI-related risk behaviours in university students is increasing	**Estimating prevalence of homosexuality and bisexuality:** This question was excluded from the questionnaire.**	Although there are very restricted areas for university students to express their same sex intimacy most of the participants stated that, there is a growth in homosexuality and bisexuality among university students.	As it mentioned above, the frequency of group sexual activity can be conclusive evidence of rising homosexuality and bisexuality among university students. It seems they may unwilling to talk about their homosexuality, but they are practising these sexual behaviours now and then.

* This sexual activity involved at least three people at the same time; this can include straight, bisexual and homosexual groups. **Both male and female same-sex sexual activity was illegal in Iran and it can result in jail penalties or execution in some cases; therefore, university students did not feel free to answer that question, even though they knew their answers will keep anonymous.

Aim-4 *To estimate the prevalence of illicit drug use among university students in Tehran*

To overcome the challenges from sparse or inconsistent data, the present study began by presenting a literature review, which included only the few studies that have examined the prevalence of substance use among high school students in Iran.

First, the present survey showed that 14.8% of university students in Tehran had experienced drug use at least once. Nearly 13% were males and the minority were females (1.8%). It was important to note that the qualitative study findings have shown that large numbers of students have experienced substance use, as almost all participants expressed that illicit substance use was common among university students, particularly in males. Therefore, males were the predominant gender to use substances in both studies.

In developed countries like Australia, rates of illegal substance use among students have increased strikingly. (94) In the United States about 37% of young individuals had used various substances at least once in their lives. (84)

In comparison, the most recently available prevalence data for high school students in Zanjan (a city in Iran) was estimated at 11.2%, with males at 18.9%, and females at 7.7%. (136) Furthermore, the prevalence of substance use in high school students in Kerman (one of the south-eastern cities of Iran) also was high at 26.5% in males and 11.5% in females. (134) In another city in Iran (Tabriz) 2% of high school students

had used these substances. (135) According to a study conducted in secondary school students about ten years ago in Iran, 11.8% of students experienced drug use at least once, with the main substances used including opium, cocaine and grass. (130) The present survey revealed that the 14.8% of substance use was slightly higher than the results from ten years ago (11.8%).

In addition, in 2006, the two most common substances among high school students were cannabis and opium (129) Ten years, later, in the current study, the most popular substances among university students were still cannabis and cocaine; however, opium had changed to hallucinogens and other stimulants. Moreover, several studies have been conducted in various societies, where almost always the use of illicit drugs was the main reason for having risky sexual behaviours, such as having multiple partners and unsafe sex. (92) Nevertheless, in the current quantitative findings, there were no significant relationships between drug use and risky sexual behaviours among university students in Tehran. This has shown that, even without using substances students still engaged in risky sexual behaviours; probably they knew that illicit drug adverse effects were better than unprotected sexual consequences. However, in the qualitative component some participants believed that amphetamine and other stimulant substances were the reason for the increasing numbers of sexual penetration, homosexuality and bisexuality among university students.

Over the past decade, people have been informed about not using illicit drugs by the media, and they also had access to finding information about

the adverse effects of illicit substances by using the internet to find this information. However, having protected sexual activity, and the adverse effect of unprotected sexual activity, has never been advertised by authorities in the media, since sexual relations that occurred outside a traditional, heterosexual marriage were illegal. Moreover, because of the restrictions on information dissemination in Iran, young individuals did not have easy access to the internet to find data about protected sexual activity and sexual health.

Aim-5 *To explore various types of illicit drug used among university students in Tehran*

Individuals who used stimulant substances would likely be at risk, not only from adverse health effects directly associated with use, but also for other co-morbidities, such as sexually transmitted infections and HIV. Given that illicit substance use, like methamphetamine, cannabis, hallucinogens, ecstasy and other stimulants, was associated with increased risky sexual behaviours, it was of significant public health concern. (83)

In the quantitative component, the university students were asked which kind of substances they used if they had any substance use experience. Eleven per cent had experienced cannabis use, also known as marijuana and grass, and most of the participants in the qualitative part (10 out of 13) stated that cannabis was very popular among students, and the quantitative part confirmed that the most common substance used by university students was cannabis.

In addition, in the quantitative study, hallucinogens and stimulants (6.9%) were estimated as the second most common substances after grass, and cocaine (2.6%) was the third commonest illicit substance used among university students in Tehran. While, in the qualitative component, experts believed that after cannabis, amphetamine and opium were very popular in university students. The evidence came from the quantitative study showed that, similar to the experts, amphetamine was not very common in university students and, since there was not a significant relationship between using these substances and unsafe sex. Therefore, we concluded that using substances cannot be said to be the only reason of unprotected sexual activity among university students. It was plausible that the lack of knowledge was the most important reason.

Furthermore, one study conducted in high school students in Alaska, United States, showed that about 43.9% of students had experience of marijuana use.

In Iran, since cannabis was the commonest substance used in the young population, many studies focused on cannabis. (160) Some researchers have noted that 1% of high school students in Iran have used marijuana at least once (2003). (129) In 2004, 0.2% of secondary school males had used cannabis at least once. (130) In Kerman, in 2006, the rate of cannabis use among high school students was estimated as 8.3% for males and 2.8% for females. (134) About 2.8% of high school boys in Zanjan used cannabis in 2009. (136) In addition, a study among college students carried out in 2011, revealed that 2.4% of students had experience of using cannabis. (131)

The present study showed that using cannabis had increased dramatically during the last decade among young students.

Currently, methamphetamine was one of the prevalent substances used among young individuals. (39) In 2012, nearly 1.2 million Americans reported using methamphetamine in the past year. In 2007, the prevalence of crystal methamphetamine use over the last year was 2.8% among young adults in the USA. (80) The prevalence of methamphetamine in American non-medical university students, in 2008, was estimated at 0.27%. (83) No specific study has been carried out on methamphetamine use among students in Iran so far, although it is one of the most popular illicit drugs worldwide at present. In the present study, for the first time crystal meth use was estimated in university students. Approximately 1.5% of university students declared that they had an experience of crystal meth of at least once in their lifetimes. However, more than half of the participants in the qualitative study believed that amphetamine and crystal meth (methamphetamine) were very common in university students.

In the current study cocaine use was estimated at nearly 2.6% among university students. Cocaine has been one of the popular substances since the previous decade. (92) However, in the qualitative component few participants (two out of 13) named cocaine as a common substance in university students. They believed that cocaine was an expensive drug and it would be unaffordable for students. In 2003, approximately 1% of high school students in Iran had experienced cocaine use. Over the last decade cocaine use has doubled. (129)

In the quantitative component, about 0.8% of university students mentioned using ecstasy at least once. On the other hand, in the interviews only one expert stated that ecstasy was a common substance used by students. Some similar studies carried out in Iran have shown that 18.5% of young adults in Tehran (161) and 4.3% of college students in the north of Iran (2005) (131), as well as 5.6% of college students in Astara (2009) (137) and 2.4% of high school students in Lahijan (2005) (132), had used ecstasy at least once in their lifetimes. However, the present investigation showed that ecstasy use was decreasing dramatically in young Iranians in recent years, and a new generation of hallucinogenic drugs like amphetamine were becoming more popular.

Similar, to ecstasy, opium was decreasing in young students. In the present study about 1.3% of university students were using opium, and fewer than half of the participants in the qualitative component (five of 13) mentioned opium as a common substance among university students in Tehran. Whereas, in 2003, nearly 3.5% of high school students used opium, (129) and, in 2009, about 5.7% of high school students used opium. (136) In comparison to the present study, using opium, which used to be the most common drug among young population in Iran, was now the least common one.

Heroin (crack) was not as common a substance in university students, as just 1% of university students declared using this drug at least once. Besides, only one participant in the interviews stated heroin was a common drug in students. As shown in a previous study in 2003 among high school students who were asked about heroin use, 2% had

experienced heroin use in their lifetime. (129) Lastly, 0.5% of students had experienced IV drug use at least once. Although this was a very small number, it would be very important to report, since IV drug users were still at the top of HIV infected patients in Iran. In the qualitative component all participants believed that there were no IV drug users among university students in Tehran; however, no study so far has been conducted about IV substance use in students in Iran.

A summary of the quantitative and qualitative findings and conclusions in substance use among university students in Tehran, are shown in Table 6-2, below.

Table 6-2 Quantitative and qualitative findings and Conclusion in substance use reported by the university students in Tehran

Aims	Hypothesis	Main findings in the quantitative study	Main findings in the qualitative study	Conclusions
Aim-4 To explore the illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of substance use:** About 14.8% of total university students had an experience of substance use in a lifetime	All participants (13 out of 13) expressed that illicit substance use is very common among university students. They also insisted that the prevalence of using substances is increasing dramatically among this young group.	Out of the total university students about 15% of them have used an illicit drug at least once in their lifetime. It seems substance use prevalence is increasing gradually but it is still not prevalent as the participants in the qualitative part mentioned.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of cannabis use**: About 11% of total university students had an experience of cannabis (grass, hashish, marijuana, weed) in a lifetime	Almost all participants (10 of 13) insisted that cannabis is the commonest substance used among university students.	Cannabis, with a prevalence of 11% among university students cannot be very a prevalent substance used by university students; however it was the most common substance used by this group. Also, there was not a significant relationship between risky sexual behaviours and this substance.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating prevalence of methamphetamine use:** About 1.5% of total university students had an experience of crystal meth (methamphetamine) in a lifetime	More than half of the participants (eight of 13) have expressed that methamphetamine, known as shishe in Iran, is very popular in university students these days.	Although many studies have shown that crystal meth was one of the main reasons for the high numbers of sexual behaviours in the present study, the frequency of methamphetamine was very low. Also there was no significant relations between risky sexual behaviours and this substance.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of cocaine use:** About 3% of total university students had experience of cocaine use in at least one lifetime.	A few participants (2 out of 13) mentioned cocaine as a substance used by university students.	Although cocaine was estimated as the third most prevalent substance among university students in the present study, it was not pointed out as a big issue among this group so far.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of ecstasy use:** Fewer than 1% of the total university students had an experience of ecstasy use in at least once in their lifetimes	Only one participant mentioned ecstasy as a common substance in university students.	As the results showed, ecstasy was not a popular substance among young university students any more.

Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of heroin use:** About 1% of total university students had experience of heroin, known as crack in Iran) at least once in their lifetimes.	Only one participant has mentioned heroin as a common substance in university students.	As the results showed, heroin was not a popular substance among young university students.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of intravenous drug use (IDU):** About 0.5% of total university students had experience of IV drug use	None of the participants stated intravenous drugs as a prevalent substance used by university students	As the results showed, intravenous drugs were not popular in young university students.
Aim-5 To explore various types of illicit drug use among university students in Tehran	Prevalence of substance use in university students is increasing	**Estimating the prevalence of opium use:** About 1.3% of total university students had experience of opium use	Five out of thirteen participants mentioned opium as a common substance used by university students.	As the results showed, opium was not a popular substance among university students.

6.3 Conclusions

As discussed in the previous chapter, the qualitative study conducted demonstrated that university students in Tehran were at risk of sexually transmitted infections and substance use. In addition, limited educational programmes and cultural issues about having sexual engagements out of a marriage commitment, and the stigma and disgrace of sexual activity, were pointed out as the main reasons for the increasing risky sexual behaviours. Although information dissemination was important in the prevention of HIV and STI, the qualitative findings demonstrated that the lack of education and information in Iran was the principal reason for the increasing high-risk behaviours.

In order to achieve a positive public health outcome for university students and the general young population in Iran, pre-existing assumptions held by the Iranian health and education system needed to be challenged and overturned. These findings were valuable for the development of targeted HIV and STI prevention strategies for the student population in Iran and its neighbouring countries, who were experiencing similar concentrated epidemics among high-risk groups.

The factors that put students at risk of becoming STI and HIV infected were varied.

In response to these behavioural factors, HIV/STI prevention and education services were required to help offset these risk factors and provide information and resources to students to help them become aware of the risk associated with unprotected practices, drug use and other risky sexual behaviours. It was clear that a limited understanding

about unsafe sex in relation to STI and HIV infections, which can be attributed to a lack of media coverage, continued to be the major barrier to effective HIV and STI prevention strategies for students. These findings did not necessarily represent a complete list and additional resources and approaches may need to be explored. Structural risk factors such as Government indifference and stigma/discrimination perpetuated both HIV and STI epidemics among young population, as many of these individuals faced structural barriers preventing them from having access to safe and stigma-free services. It would appear that as long as leaders and policy makers in Iran continued to believe that high-risk behaviours were insignificant, there will be no shifts in policy for these behaviours among the young population.

In the next chapter the intervention recommendations offered directions for future initiatives that aimed to mitigate the increasing prevalence of high-risk behaviours among students.

CHAPTER SEVEN

7. LIMITATIONS AND RECOMMENDATIONS FOR A WAY FORWARD

7.1 Introduction

HIV was on the rise worldwide although, in developed countries like Australia, HIV infections was under control; (92, 93); however, the trend in HIV infections was noticeable in Iran. It was important to note that, although the prevalence of HIV infection was not currently high among young Iranian people, the reports showed that more than two-thirds of HIV infected cases had been detected in recent years. (162) Therefore, Iran has one of the highest trends in the prevalence of HIV infections, with some signs that this epidemic was coming soon.

In addition, university students were a large proportion of the young population in Iran. The majority of individuals in the very critical ages for sexual activity (between 18-20 years old) were entering universities. Therefore, students would be an at risk group, particularly when they had never been taught about unprotected sex.

The present study assessed some factors that perpetuated HIV/STI high-risk behaviours among students. This concluding chapter begins by summarising the nature of the study, the rationale that propelled this investigation, and how it was conducted.

This investigation has been the only comprehensive study to be conducted in Iran that assessed HIV and STI risk behaviour factors. There were many new findings that needed to be explored in more detail, as well

as future initiatives and plans that should be assessed. Ideas for future research initiatives were also included as a discussion point.

The previous chapter discussed various high-risk behaviours common in young university students in Tehran. It also discussed the qualitative and quantitative study findings in comparison to other data extracted from the literature. Although the potential strategies discussed in Chapter 6 were comprehensive in scope and addressed the study's findings, these did not necessarily represent a complete list, so additional resources and approaches may need to be explored.

The present chapter explores potential high-risk behaviour prevention strategies and initiatives in greater detail. It recommends a mechanism for the achievement of these aims to foster improved sexual health outcomes and reduce unsafe sex among university students and in other countries with similar HIV epidemics among young populations, specifically, university students. In addition to these individual level interventions, future strategies also needed to take into account structural level factors that continued to place this population at elevated risk of unsafe sex.

First, it was necessary to identify high-risk behaviour prevention and strategies that catered to individual factors, strategies that promoted education and information. Counselling services may also be necessary for any programme to succeed in lowering the rate of unsafe sex among this group.

Therefore, students should be taught about protected sexual activity before starting university. There should have been some classes in high schools to teach students about sexual health. If this education started in

secondary schools it will be more effective. A training package on safe sexual activity and HIV/STI can also be beneficial among this group.

Second, any intervention will need to provide university students information and practical education that empowered them to either reduce their high-risk behaviours, or use barrier methods constantly, and correctly, to protect themselves and their partners.

Young individuals almost always unconsciously forget words of advice about using protection during sexual activity; therefore, not only education but also the repetition of that seemed critical. Repetition was like vaccination for infectious diseases.

Education should be explicit and it also should be programmed according to the different grades of young students. Furthermore, education should be scientific; using numbers and statistics would be very helpful for university students.

In addition, designing an educational package, including sexual activity (physically, psychologically) and information about HIV, STIs and safe sex will be useful for university students. Furthermore, the education system needed to implement specific and focused educational programmes for students in school before university admission, and to promote health promotion. It was important that university students understand HIV prevention and transmission, as well as develop positive attitudes and good practices. The high school was much better place than university to have peer education programmes that addressed self-esteem, healthy sexual attitudes, safe sex, and the consequences of having unprotected sex and using illicit drugs.

A social networking, Question & Answer (Q&A) website or a hotline to answer the university student's sexual problems anonymously will also be a very practical sexual health promotion strategy.

Third, every effort should be made to create widespread access to comprehensive information in the area of unsafe sex and the sexual transmission of infections. The main accessible way to teach sexual health information was through the media. However, advertising about protected sex or any other sexual health practices was forbidden to be broadcast in Iran. Unfortunately, there were no notices or cautions against unprotected sex, HIV or STIs in the news, or on radio or television in Iran. The media were able to be effective in making people aware of the adverse consequences of unprotected sexual activity. The media also can advertise counselling and behavioural centres for HIV and STI that provided information about risky behaviours related to HIV and STI and also the treatment and care services for patients with these diseases.

Therefore, policy makers needed to be aware that education and repetition about sexual health, plus advertising about sexual health in the media, will play a critical role in reducing risky behaviours among young students and will be one strategy in promoting sexual health in Iran.

Fear of stigma and discrimination were other reasons why university students did not access HIV/STI and sexual health services, so a comprehensive high-risk behaviour prevention strategy offering HIV/STI education and resources must be accessible for the young population, specifically, university students.

Ultimately, a key intervention involving comprehensive and multi-pronged high-risk behaviours related to HIV/STI would need to aggressively target stigma and discrimination. Students may then be more willing to access protected sexual activity and sexually transmitted disease information easily. In order to be successful, these services needed to be discrimination free. One such strategy would be to increase national level advocacy and awareness among political leaders and health care providers.

7.2 Summary of the study

The prevalence and incidence of HIV and STIs was on the rise in Iran and was climbing to epidemic proportions. Upon closely examining the statistics on the courses of these diseases, it has become apparent that unsafe sexual activities presented the largest risk for transmitting or becoming infected with these diseases.

In light of this stark gap in the research, the present investigation sought to uncover the factors associated with the increased risk of high-risk behaviours in university students.

The present study began by presenting a literature review on the current risky behaviours and the illicit drug situation in different countries, specifically, societies with similar socio-economic issues to Iran, which included the very few studies that examined the factors associated with sexual risky behaviours among university students.

Given this bleak picture, the present research sought to address the gaps in the literature, while providing recent data on the factors that helped exacerbate or reduce university students' high-risk behaviours in Iran.

Finally, the findings from the literature review, the quantitative survey and qualitative study were conducted to explore the prevalence of sexual behaviour and illicit substances related to HIV/STI.

The present study identified the high-risk behaviours associated with STIs and HIV. By understanding these factors in greater detail than previously it will be possible to begin targeting structural interventions and policies that can facilitate safer sex practices among young individuals in Iran.

It was important to begin targeting HIV/STI risks among students in schools and universities as the largest populated young community in Iran.

7.3 Limitations and restrictions

While this investigation examined the risk factors associated with HIV/STI in university students in Tehran, there were a number of limitations and restrictions within the present framework that may affect the findings and interpretations discussed in this study. It should be noted that these limitations did not adversely affect the collection and validity of the data gathered.

In the literature review, the first studies published in languages other than English were excluded from the literature review. This may affect the results that were reported so far as those in Farsi (Iranian language) may have been omitted in the current study. To overcome this, publications in Farsi were carefully translated by researcher.

The researcher aimed to collect responses that were honest, reliable and unbiased and, as such, it was deemed that a mixed methods (quantitative

and qualitative) survey would be the most appropriate method in achieving this goal.

Due to the quantitative nature of the instrument, the responses were controlled and governed by the structure and requirements of the questionnaire. Paper and pen methods of survey data collection were used in the quantitative study. Face-to-face interviews were not conducted in this study component as this data collection method would have potentially limited the number of students reached, as well as restricting the candour of their responses. The researcher's aim was to collect responses that were as unbiased, honest, accessible and reliable as possible. Therefore, a paper and pen questionnaire based on an anonymous survey was deemed to be the most appropriate and effective manner in which to achieve the desired outcomes and ensure data validity.

By administering the quantitative survey via an anonymous questionnaire, this approach allowed participants to be candid in their responses, particularly in light of the sensitive sexual and behavioural nature of the survey questions. Nevertheless, it was important to note that a paper and pen questionnaire survey approach was more likely to be biased toward individuals who have studied in the universities that were selected as the main in each area so, therefore, the data from this study component over-represented students from some universities.

As one of the major limitations in this study, the data had to be a self-reported history of STIs, which was much more limited than what the "prevalence of STI" implied. There were no biological tests to validate self-

reports. The reason for this choice was to reduce the risk of this study and to keep the self-reported questionnaires used for obtaining any history of any high-risk behaviours and the history of STI infections anonymous. Since the diagnosis of an STI was not just by symptoms but also required a clinician to confirm it but, as the students had to stay anonymous, the only question we could ask was if they had any STIs previously or not, so it meant that the disease had not been confirmed by a clinician. By asking about STIs this included all kinds of sexually transmitted infections that could transmitted in any type of sexual activity, while having an STI was the focus of this study. According to the ethics approval documents, and the study's policy to keep the students anonymous, no medical tests or physical examination were suggested for this study. Because students may not recognise STIs from non-STI symptoms I needed to ask them if they had any STI previously and if they answered, Yes, it meant they already knew they had had an STI as their symptoms had been confirmed by a clinician. Therefore, estimating the prevalence of STI was explored as one of the main aims of this study.

As discussed in Chapter three, volunteer-selection was chosen for recruiting the participants in the quantitative component, so students volunteered to participate upon seeing the advertisement and we did not know whether all students who saw the advertisement made the decision to participate in this study or not. Although this method opened the possibility of major selection biases, self-selection biases and unknown participant biases, we were not able to use random sampling since, according to Iranian culture; students would not be comfortable in

answering some of the questions. According to this project's ethical approval, we also needed to maintain their confidentiality and they had to stay anonymous. Hence, we chose the volunteer selection option.

Furthermore, in the quantitative study, there was a limitation resulting from how to measure having a high-risk partner. For example, for men, the question was if they paid for sex; for women, it was if their partner had other partners. These seem to be different questions; however, since in Iran, male sex-workers did not exist and women sex workers existed illegally; therefore, we could not put the same questions to females. So, instead of this question, the equivalent question was if they had had sex with someone who had taken part in various sexual activities. Both questions achieved the same goal and were considered equivalent in Iranian culture.

In addition, there was a limitation resulting from measuring alcohol use. Although alcohol was the main substance drunk among youth across the world, Iran was an Islamic country with restricted laws; therefore, selling, buying and using alcohol was not only illegal but also was against the Islamic law, so we did not include alcohol as a substance used, since it would not be accepted by the Iranian government and the Research Centre for HIV/AIDS. Also, the students could not be comfortable in answering this question.

The main limitation in this mixed method study was the participants in the quantitative and qualitative components worrying that their names may be included in future reports or publications. We made a commitment that this will not happen and the participants will remain anonymous. Also, the

authorities at each university where the data were collected were asked not to mention the name of their university in future reports and publications. However, because of the very restricted atmosphere culturally and religiously among Iranian, people were not willing to talk openly about their own sexual relationships, even if they remained anonymous. They were afraid to be judged by others. Sex is not an easy word to talk about in the Iranian community.

In the qualitative study significant people who had influence among young individuals and had unique expertise in their respective fields were selected for interview. Although the people with the real first-hand experience and information were the young students themselves, cultural and religious restrictions in Iran, made them reluctant to talk about their sexual experience or any other high-risk behaviour with other people especially when they knew their words were being recorded.

Although the limitations in the above may be relevant across disciplines and research data collection, the majority of these did not adversely affect the collection and validity of the data.

7.4 Conclusions and future recommendations

Illegal drugs and sexual relationships out of marriage were against government law in Iran and also against Islamic law and, as discussed in this study, the number of HIV/STI infections were increasing dramatically among the young population, that was why undertaking some research into high-risk behaviours was the first line of priority for Iranian public health organisations and research centres. The Iranian Research Centre

for HIV/AIDs was one of the main centres in Iran, which had the authority to do such critical quantitative and qualitative research among Iranian youth.

In addition, due to restrictions by the Iranian government as well as the cultural limitations in Iran, there was no literature or resources relating to this field of study in Iran, so this project was a pioneer. Hence, I had to review the literature in countries with similar cultures.

In a young, developing country like Iran, attention to sexual and reproductive health was of paramount importance. Many factors boosted the importance of this issue among young individuals in Iran. Factors like, modernity and westernisation have been widespread in highly populated cities and these had an apparent influence on society and culture. Access to information technologies like the internet and satellites have had a crucial role in traditional and social changes. Pre-marital and multiple sexual partners were the clear outcomes that were increasing among young university students, especially in large cities like Tehran. Moreover, due to the lack of comprehensive education and services for sexual health for this vulnerable young group in Iran, risky sexual behaviours were common.

The factors that put university students at risk of these behaviours were varied and interconnected, with a constant interplay among them. Unprotected sexual activity, multi-partnerships, sex with sex-workers, being in a sexual activity with several people at the same time and using sexually enhancing substances, enhanced the risk of sexually transmitted infections, including HIV.

In order to reduce high-risk behaviours among university students it was imperative that educational resources and interventions were readily available and easily accessible to this group. By providing these people with educational tools and resources that were specifically tailored to meet their needs, they were likely to become more aware of the risk factors associated with high-risk behaviours. Ultimately, by ensuring that university students can easily access these resources the

information obtained from this study will be instrumental in driving policies and programmes to provide targeted interventions. In addition, the findings from the quantitative study and qualitative study among university students in Tehran indicated that there were several areas where future studies were warranted.

First, given that this was one of the first studies to conduct a comprehensive investigation of the situation of risky sexual behaviours in university students in Iran, several factors have either shifted or been largely been ignored in previous studies. Furthermore, few studies have examined illicit substance use related to HIV/STI among university students in Iran so an investigation of these factors also needed to be conducted.

Second, studies should also examine the factors underlying the barriers that prevented government officials and policymakers from acknowledging high-risk behaviours for contracting HIV and STI, and identifying the factors that can help facilitate positive and beneficial media presentations of HIV/STI.

Third, additional studies needed to be conducted to explore the nature of multiple partnerships and group sex, which were going to become common among the young population. Pilot studies should also be conducted urgently to assess these risky sexual behaviours. Finally, it would be beneficial to create a programme in the media to warn about sexually transmitted infections, particularly HIV, and explain about safe sex and other essential information in this area in detail.

Ultimately, because of restrictions on these studies in Iran, references and research data in this field were very rare and this study was a pioneer in many ways, so this study was a considerable work, as the rarity of the data and its potential insights make it very valuable for this field of study.

While conducting this study, I had to be very conservative at some stages of the project; otherwise there would be the possibility of the whole project being stopped by the Iranian government. In addition, some data collection and methods were out of the researcher's hands to avoid putting the participants and interviewees at risk. I had to be so conservative in my writing and future recommendations not to put myself at risk of investigation by the Iranian government as the Iranian government always denied the facts of high-risk sexual behaviour and manipulated the statistics.

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APPENDICES

Appendix A

Cross sectional study questionnaire

Assessment of anonymous HIV and STI-related high-risk behaviours

BASIC INFORMATION

University name…….

1. Subject's identification number (Please DO NOT write anything in this part) |_ | _ | _ |
2. Subject's sex | _ | 1= Male; 2= Female
3. Subject's age | _ | _ | Enter age in years
4. Subject's marital status | _ | 1= Single; 2=Married

QUESTIONS

5. Have you ever been in any events with other university students? | _ | 1= Yes; 2=No
6. Have you ever been in any university student's party? | _ | 1= Yes; 2=No
7. Have you ever known any university student who uses illicit drugs? | _ | 1= Yes; 2=No
8. Have you ever been in some parties which people using illicit drugs? | _ | 1= Yes; 2=No
9. Have you ever had any friend who uses illicit drugs? | _ | 1= Yes; 2=No
10. Have you ever taken an illegal drug experience? | _ | 1= Yes; 2=No

If yes, go to Q11
If no, go to Q20

11. ‘‘Have you ever, even once, used ‘Crack cocaine’?’’ | _ | 1= Yes; 2=No
‘‘How long has it been since you last used ‘Crack cocaine’?’’……..

12. ‘‘Have you ever, even once, used ‘Crystal methamphetamine’?’’ | _ | 1= Yes; 2=No
‘‘How long has it been since you last used ‘Crystal methamphetamine’?’’…….

13. ‘‘Have you ever, even once, used cannabis like marijuana (pot) or hashish?’’ | _ | 1= Yes; 2=No
‘‘How long has it been since you last used cannabis like marijuana (pot) or hashish?’’…….

14. ‘‘Have you ever, even once, used hallucinogens like LSD?’’ | _ | 1= Yes; 2= No
‘‘How long has it been since you last used hallucinogens like LSD?’’……

15. ‘‘Have you ever, even once, used ‘ecstasy’?’’ | _ | 1 =Yes; 2 =No
‘‘How long has it been since you last used ‘ecstasy’?’’ …….

16. ‘‘Have you ever, even once, used opiates like heroin (crack)?’’ | _ | 1= Yes; 2= No
‘‘How long has it been since you last used opiates like heroin (crack)?’’……

17. ‘‘Have you ever, even once, used a needle to inject any other stimulant/a stimulant which it was illicit?”
| _ | 1= Yes; 2= No

‘‘How long has it been since you last used a needle to inject (any other stimulant/any stimulant) which it was illicit?”……..

18. ‘‘Have you ever, even once, used a needle to inject any other stimulant/a stimulant that you took only for the experience or feeling it caused?’’ | _ | 1=Yes; 2= No

‘‘How long has it been since you took only for the experience or feeling it caused?’’…….

19. “Is there any other illicit drug that you may use? If yes what is its name?”.....
‘‘How long has it been since you last used that drug?’’……..

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20. Have you ever had experience of sexual relationship? | _ | 1=Yes; 2 =No

If yes, go to Q21
If no, go to Q35

21. ‘‘Thinking about the last 12 months, how many sex partners (any kind of sex) have you had? Please count every partner, even those you had sex with only once.’’ _____

22. Have you ever had vaginal intercourse? | _ | 1=Yes; 2 =No

If Yes: 23. ‘‘Did you use a condom the last time you had vaginal intercourse?’’
| _ | 1=Yes; 2 =No

24. Have you ever had oral sex? | _ | 1=Yes; 2= No

If Yes: 25. ‘‘Did you use a condom the last time you had oral sex?’’
| _ | 1=Yes; 2= No

26. Have you ever had anal sex? | _ | 1= Yes; 2= No

If Yes: 27. ‘‘Did you use a condom the last time you had anal sex? ’’ | _ | 1 = Yes; 2 = No

28. “In the past 5 years, have you had any STIs (gonorrhoea, chlamydia, Herpes simplex virus (HSV-2), warts (HPV) or syphilis)?’’

| _ | 1 = Yes; 2 = No

29. ‘‘In the past 12 months, have you been treated or received medication from a doctor or other medical care provider for a sexually transmitted disease like gonorrhoea, chlamydia, Herpes simplex virus (HSV-2), warts (HPV) or syphilis?’’

| _ | 1 = Yes; 2 = No

30. ‘‘In the past 12 months, have you ever had sex with a sex worker?” | _ | 1 = Yes; 2 = No

If Yes: 31. ‘‘Did you use a condom the last time you had sex with them?’’ | _ | 1 = Yes; 2 = No

32. ‘‘In the past 12 months, have you ever had sex with a person just for one time without knowing her/his sexual background?” | _ | 1 = Yes; 2 = No

If Yes: 33. ‘‘Did you use a condom when you had sex with her/him?’’ | _ | 1 = Yes; 2 = No

34. ‘‘In the past 12 months, have you ever had HIV test?” | _ | 1 = Yes; 2 = No

35. “Is there anything else you want to mention?” _____

If you need any help from a health service provider or any questions you can contact the Counselling and Behavioural Centre located in Imam Khomeini hospital.

Address: Hasan Abad-e-Baqerof, EXP East Bagherkhan, Chamran, Iran
Phone number: 2161190

Appendix B

Qualitative study questionnaire

The semi-structured interviews will be broadly guided by the following prompts

Thank you for coming to this interview

According to your professional expertise and as you have interaction with university students closely and know their problems clearly, I am really interested in asking you about some of your experiences in this regard. You may have some opinions and information in the field of risky behaviours which is common among young population such as university students.

I will be thankful to know your opinions and experiences by answering to the following questions.

1. What is your viewpoint about prevalence of illicit drug use among university students in Tehran?

2. What is your opinion about different types of illicit drug use among university students in Tehran? For example: cannabis, crystal methamphetamine, cocaine, hallucinogens, ecstasy (MDMA), heroin (crack), injecting drugs, other stimulants and opium.

3. What is your opinion about the situation of risky sexual behaviours among university students in Tehran?

4. What is your opinion about unsafe sex or unprotected sexual engagement among university students in Tehran?

5. What is your opinion about prevalence of STI among university students in Tehran?

6. What is your opinion about prevalence of multi-partnership and other highly sexual behaviours among university students in Tehran? For example: bisexuality, homosexuality, group sex and so forth.

7. Is there anything else you would like to tell me? Or, any questions I should have asked but didn't?