



# LUND UNIVERSITY

## Sexual behaviour among Ugandan university students: A gender perspective

Mehra, Devika

2013

[Link to publication](#)

*Citation for published version (APA):*

Mehra, D. (2013). *Sexual behaviour among Ugandan university students: A gender perspective*. [Doctoral Thesis (compilation), Department of Clinical Sciences, Malmö]. Department of Clinical Sciences, Lund University.

*Total number of authors:*

1

### General rights

Unless other specific re-use rights are stated the following general rights apply:

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117  
221 00 Lund  
+46 46-222 00 00

# Sexual behaviour among Ugandan university students: A gender perspective

Devika Mehra



**LUND**  
UNIVERSITY

DOCTORAL DISSERTATION

by due permission of Faculty of Social Medicine and Global Health,  
Lund University, Sweden

To be defended at CRC Aula, Date 25th October, 9.00 am.

*Faculty Opponent* Stefan Swartling Peterson  
Professor of Global Health at Karolinska Institutet, Sweden  
Supervisor Per-Olof Östergren  
Co-Supervisor Anette Agardh

Organization LUND UNIVERSITY  Faculty of Medicine Department of Clinical Sciences, Malmö Social Medicine and Global Health Author: Devika Mehra		Document name DOCTORAL DISSERTATION
		Date of issue 25 <sup>th</sup> October 2013
		Sponsoring organization
Title and subtitle: Sexual Behaviour among Ugandan university students: A gender perspective		
Abstract  Feminisation of the HIV/AIDS epidemic in sub-Saharan Africa is an important public health concern. Therefore, it is crucial that we understand the various risk factors that shape unsafe sexual behaviours among young people in Uganda. The overall aim of this thesis was to gain a deeper understanding of the various factors that have an association with risky sexual behaviours among Ugandan university students, focusing on a gender perspective. This knowledge can contribute to effective policy formulation and implementation of programs. In 2010, 1,954 students participated in a cross-sectional study and the data was collected using a self-administered questionnaire. Logistic regression was used as the main analytical tool for the analysis and effect modification analysis was conducted for some of the associations. Study I found that there was an association between non-use of contraception and socio-demographic factors, relationship status, and alcohol consumption. The socio-demographic determinants that affected this association were different for males and females. Early sexual debut was found to modify the effect of this association. Study II concluded that there was an association between alcohol consumption and the experience of sexual coercion among Ugandan university students. Frequent consumption of alcohol on the occasion of sexual intercourse and poor mental health were found to have a synergistic effect with recent experience of sexual coercion. Study III demonstrated an association between self-reported poor academic performance and inconsistent condom use with a new sex partner. Females who were poor academic performers were found to be at a higher risk of inconsistent condom use compared to their male counterparts. Study IV showed that there is an association between low condom efficacy and inconsistent condom use with a new sex partner. Gender differences were observed: females with low condom efficacy were at a higher risk of inconsistent condom use, in comparison to males. Our studies concluded that the key factors that contribute towards risky sexual behaviours among Ugandan university students were socio-demographic factors, relationship status, alcohol consumption, academic performance, and condom efficacy. Unequal gender power relations in this region further aggravates the sexual risk behaviours. Therefore, we need to create a policy action environment (not merely policies) in which sexual and reproductive health rights is addressed by raising awareness among males and females. In universities this could be achieved through skill building programs such as sex education, peer counseling, and partner communication, with a special focus on women by providing them skills for negotiating condom and contraceptive use. These programs need to address the socio-cultural and gender perspectives in addition to focusing on safe sex and sexual rights.		
Key words: Sexual behaviour, alcohol, university students, condom, contraception, sexual coercion, academic performance, Uganda		
Classification system and/or index terms (if any)		
Supplementary bibliographical information		Language: English
ISSN 1652-8220		ISBN 978-91-87449-86-4
Recipient's notes	Number of pages	Price
	Security classification	

Distribution by (name and address)

I, the undersigned, being the copyright owner of the abstract of the above mentioned dissertation, hereby grant to all the reference sources permission to publish and disseminate the abstract of the above mentioned dissertation.

Signature \_\_\_\_\_ Date \_\_\_\_\_

# Sexual behaviour among Ugandan university students: A gender perspective



**LUND**  
UNIVERSITY

Devika Mehra

Copyright © Devika Mehra, 2013  
Cover photo copyright © Marvin Lubega  
Department of Clinical Sciences, Division of Social Medicine and Global Health  
Faculty of Medicine, Lund University  
205 02, Malmö, Sweden

ISBN 978-91-87449-86-4  
ISSN 1652-8220  
Doctoral dissertation series 2013:113

Printed in Sweden by Media-Tryck, Lund University



**CLIMATE  
COMPENSATED  
PAPER**



**REPA**<sup>®</sup>  
A part of FFI (the Packaging and  
Newspaper Collection Service)

# Abstract

Feminization of the HIV/AIDS epidemic in sub-Saharan Africa is an important public health concern. Therefore, it is crucial that we understand the various risk factors that shape unsafe sexual behaviours among young people in Uganda. The overall aim of this thesis was to gain a deeper understanding of the various factors that have an association with risky sexual behaviours among Ugandan university students, focusing on a gender perspective. This knowledge can contribute to effective policy formulation and implementation of programs. In 2010, 1,954 students at Mbarara University of Science and Technology in southwestern Uganda participated in a cross-sectional study in which a self-administered questionnaire was used to assess socio-demographic factors, alcohol consumption, mental health, experience of sexual coercion, condom use, contraceptive use, and other sexual behaviours. Logistic regression was used as the tool and effect modification analysis was conducted for some of the associations. The data used in our studies was stratified by sex. Study I found that there was an association between non-use of contraception and socio-demographic factors, relationship status, and alcohol consumption. The socio-demographic determinants that affected this association were different for males and females. Early sexual debut was found to modify the effect of this association. Study II concluded that there was an association between alcohol consumption and the experience of sexual coercion among Ugandan university students. Frequent consumption of alcohol on the occasion of sexual intercourse and poor mental health were found to have a synergistic effect with recent experience of sexual coercion. Study III demonstrated an association between self-reported poor academic performance and inconsistent condom use with a new sex partner. Females who were poor academic performers were found to be at a higher risk of inconsistent condom use compared to their male counterparts. Study IV showed that there is an association between low condom efficacy and inconsistent condom use with a new sex partner. Gender differences were observed: females with low condom efficacy were at a higher risk of inconsistent condom use in comparison to males. Our studies concluded that the key factors that contribute towards risky sexual behaviours among Ugandan university students were socio-demographic factors, relationship status, alcohol consumption, academic performance, and condom efficacy. Unequal gender power relations in this region further aggravates the sexual risk behaviours. Therefore, we need to create a policy action environment (not merely policies) in which sexual and reproductive health rights is addressed by raising awareness among males and females. In universities this could be achieved through skill building programs such as sex education, peer counseling, and partner communication, with a special focus on women by providing them skills for

negotiating condom and contraceptive use. These programs need to address the socio-cultural and gender perspectives in addition to focusing on safe sex and sexual rights.

**Key words:** Uganda, university students, sexual behaviour, mental health, sexual coercion, condom use, contraceptive use, alcohol use, condom efficacy

*To my family*



*Class, race, sexuality, gender and all other categories by which we categorize and dismiss each other need to be excavated from the inside.*

*Dorothy Allison*

# List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
CI	Confidence Interval
GPA	Grade point average
HED	Heavy episodic drinking
HIV	Human Immunodeficiency Virus
HSCL 90	Hopkins Symptom Checklist 90
HSCL 25	Hopkins Symptom Checklist 25
ICPD	International Conference on Population Development
MOH	Ministry of Health
MUST	Mbarara University of Science and Technology
OR	Odds Ratio
STI	Sexually transmitted infection
US	United States of America

# List of Publications

- I. Mehra D, Agardh A, Pettersson KO, Ostergren PO: Non-use of contraception: determinants among Ugandan university students. *Glob Health Action* 2012, 5:18599
- II. Mehra D, Agardh A, Stafström M, Ostergren PO: Does drinking alcohol expose Ugandan university students to sexual coercion? A cross-sectional study *Manuscript submitted for publication*
- III. Mehra D, Kyagaba E, Ostergren PO, Agardh A: Association between self-reported academic performance and risky sexual behaviour among Ugandan university students: A cross sectional study. *Manuscript submitted for publication*
- IV. Mehra D, Ostergren PO, Ekman B, Agardh A: Inconsistent condom use with a new sexual partner among Ugandan university students from a gender perspective: A cross-sectional study. *Manuscript submitted for publication*

# Table of Contents

<b>Abstract</b>	5
<b>List of Abbreviations</b>	9
<b>List of Publications</b>	10
<b>Introduction</b>	13
Gender health inequality	14
Theoretical framework of gender	14
Uganda	15
Policy environment and health system challenges	16
Factors for risky sexual behaviours among Ugandan university students	17
Conceptual Framework : The social-ecological model	19
<b>Aims</b>	24
General Aim	24
Specific Aims	24
<b>Material and Methods</b>	25
Study design and setting	25
Data collection and analysis	25
Measures	28
Statistical methods	33
<b>Results</b>	35
Study I	38
Study II	41
Study III	45
Study IV	49
<b>Discussion</b>	52
Strengths and limitations	56

Methodological considerations	57
<b>Conclusions and recommendations</b>	59
<b>Summary in Swedish</b>	60
<b>Acknowledgements</b>	63
<b>References</b>	66
<b>Appendix</b>	74

# Introduction

Today, we have a larger population of young people of ages 10 to 24 than ever before in history: an estimated 1.8 billion representing a quarter of the world's population [1]. Nearly 90% of them live in low-or middle-income countries [2]. Structural determinants such as national wealth, income inequality, access to education, and gender inequality constitute the social determinants of health and cause much of the health inequity within and between countries [3-5]. Social determinants affect the health of young people who are crucial for the economic development of nations [4]. There has been a lot of international discussion about the demographic dividend and the power of young people's contribution to global development [6]. However, the demographic transition has not been realized in low-and middle-income countries, which is why we need to invest in young people's health and their well-being [7].

In spite of the commitments made in the program for action of the 1994 International Conference on Population and Development (ICPD), sexual and reproductive health needs of young people still remain poorly understood and inadequately served [8]. This neglect has far-reaching consequences for the lives of this population, which is evident from the global burden of disease. In 2004, 2.6 million deaths occurred in 1.8 billion young people ages 10 to 24 years, out of which 97% of the deaths occurred in low and middle-income countries [9]. Some of the prominent causes of this were HIV/AIDS and tuberculosis, which contributed to 11% of the deaths; another 15% of the mortality occurred due to maternal conditions [9].

The bio-social gap between the early onset of puberty and the increasing age of marriage has widened in most low-to middle-income countries [10, 11]. This increases window for pre-marital sexual activity, which has stigma attached to it in Asia and Africa, their young age further exposes them to the risk of unwanted pregnancies, unsafe abortions, and sexually-transmitted infections (STIs) [12-15].

Young people ages 15 to 24 comprise more than twenty percent of the sub-Saharan African population [16]. There is a wide range of empirical evidence that has highlighted the prevalence of risky sexual behaviours among this population, such as early sexual debut, having multiple sex partners, and non-use of condoms and contraception [11, 17-19]. These risky sexual behaviours have been the prime driver of the HIV epidemic in sub-Saharan Africa [20, 21].

Feminization of the HIV/AIDS epidemic has also been a prominent phenomenon in sub-Saharan Africa [22]. Young people between the ages of 15 to 24 are particularly affected with 75% of all HIV infections occurring in women in this region [23], where the epidemic has been exacerbated due to existing socio-cultural factors, gender inequalities in particular [24]. But today understanding of how the HIV pandemic moves and develops should be understood in a broader perspective addressing gender, health system challenges, education, poverty, sexual and reproductive health needs of young people, and that of all individuals irrespective of their sexual orientation [25].

### **Gender health inequality**

Gender inequality is prominent on the global agenda for social change, as evident in the United Nations Third Millennium Development Goal (MDG 3), that addresses 'gender equality and empowering women' [26]. According to the report on the social determinants of health, reducing the health gap in a generation is possible only if we address the existing gender inequalities, and women's empowerment is the key to achieving fair distribution of health [5]. This report further states that gender inequalities are pervasive in all societies but the magnitude varies in different contexts, something which influences women's health in terms of discriminatory feeding patterns, violence against women, lack of decision-making power, and limited possibilities of improving one's health. Therefore, gender equity must stand for absence of bias at various levels in a society within households, societal norms regarding male and female sexuality, reproduction and rights, health systems, policies, and research [27, 28].

### **Theoretical framework of gender**

Gender is a concept used as a social and cultural construct, as opposed to the biological distinction between the sexes [25]. Gender and sexuality have been explained in the literature by various feminist theorists. According to Connell, the theory of gender and power (social structural theory) is based on sexual inequality and gender power imbalance [29]. According to this theory, there are three major social structures that characterize gendered relations: the sexual division of labor, the sexual division of power, and the structure of cathexis explained as the social norms and affective attachments regarding how men and women relate to each other in a society [29]. The extended versions of this theory propose that these structures exist at societal and institutional levels through social mechanisms [30]. Such mechanisms produce gender-based inequalities and disparities, which create power imbalances.

Traditional gender roles are based on the unequal distribution of power between men and women, which further aggravates these gender inequalities [30]. It can be argued that these traditional gender role-based attitudes reflect individual endorsement and internalization of giving social norms, more power to men than women, and women to risky sexual situations [31]. Also, men who internalize such social norms may feel the pressure to behave in a stereotypical masculine manner that may include having multiple and casual sexual partners, and women may leave the important sexual decisions to men [31]. Power relations around sex, reproduction, and the complex intersections of gender profoundly affect women's health-seeking behaviour and health outcomes [27]. These gender power imbalances in sub-Saharan Africa have been identified as one of the major reasons for unwanted pregnancies, STIs, and feminization of the epidemic HIV/AIDS.

Therefore, there is a crucial need to understand gender and sexuality closely, not only with a narrow focus on addressing sexual reproductive health outcomes regarding pregnancies and diseases, although that is certainly crucial in this era of HIV/AIDS. But we also need to widen our understanding about the sexual and reproductive health needs of young people, by using different analytical frameworks to weigh the various factors that shape their behaviour. It is imperative that we move towards a society with more balanced gender relations that are equally fair to men and women. Hence, there is a need to approach sexuality in more positive terms, emphasizing on pleasure, desire intimacy, and respecting the sexual rights of each individual and being sensitive towards all sexual orientations.

## **Uganda**

Uganda is one of the 49 poorest countries in the world, and its population growth is 3.3% which is one of the highest in the world [32]. According to the Uganda Bureau of Statistics, the estimated population in 2012 was 34.1 million. [33]. Uganda has a young population, nearly half of which is below the age of 15, and another 20% are between 15 and 25 [34]. With the introduction of universal primary and secondary education, there is an increasing number of students going to schools and universities [35]. The national prevalence of HIV is 7.3% [36]. Its prevalence for those ages 15 to 24 differs for males (2.1%) and females (4.9%) [36]. Furthermore, there is a higher prevalence of HIV in females (7.1%) than males (2.8%) between the ages of 20 to 24. Amid the high HIV prevalence there is a high frequency of risky sexual behaviours, with glaring differences between males and females in this region, as described below.



Table 1. Prevalence of risky sexual behaviours on the basis of sex in the age group 15 to 24 years over the last 12 months

Indicators	Males (%)	Females (%)
Age at first sex below 15 years among 20-24 years <sup>1</sup>	12.8	16.1
More than one sexual partner <sup>1</sup>	8.9	2.1
Cumulative prevalence of concurrent partners	4.8	1.1
Physically forced to have sex against will <sup>2</sup>	2.1	5.8
Reported STI related symptom	9.1	15.8
Condom use at last sex among never married <sup>1</sup>	62.7	53.6
Contraceptive use in sexually active unmarried women age 15-19 years (any modern method) <sup>1</sup>	n.a.	35.3
Married by the age of 15-19 years <sup>2</sup>	0.2	3.5
Experience of teenage pregnancy <sup>1</sup>	n.a.	24

<sup>1</sup>Uganda Demographic and Health Survey 2011 <sup>2</sup>Ugandan Aids Indicator Survey 2011

According to the table given above a greater percentage of females have had an early sexual debut. This may be due to the large number of girls entering into early marriage, which puts them at a higher risk for unwanted pregnancies and STIs. A higher percentage of males reported having had multiple sexual and concurrent partners, which could be a risk factor for spreading HIV, especially considering that the prevalence of condom use on last occasion of sex is low. It is evident from the statistics above that there is a prevalence of risky sexual behaviours among the general population, with striking gender differences. Therefore, there is a need for interventions that consider gender issues which will help us in improving the reproductive health indicators of the country.

### **Policy environment and health system challenges**

There are favorable youth policies that do exist in Uganda, including the National Youth Policy [37], sexual and reproductive health policy, sexual and reproductive health minimum package, national adolescent health policy [38], and a gender policy [39]. Despite these well-meaning policies, meeting the sexual and reproductive health needs of young people continues to be a challenge. Uganda's health sector strategic plan for 2010 to 2015 includes procurement and distribution of contraception for all males and females, with a special focus on adolescents [40]. By contrast, there is evidence from a prior study conducted in Uganda that young people face refusal or restrictions when they demand contraceptives from providers [41]. It was found that nearly one-third of the providers said that they will not provide contraceptives to

individuals who are younger than 18, unmarried, still in school, or are without children, although the policy guidelines of Uganda have no such requirements. Therefore, resistance from providers due to individual and cultural biases demonstrates an unwillingness to prioritize young people's unmet need of contraceptives. The existing gap between sexual and reproductive health policy and the availability of contraception restricts actual contraceptive use.

### **Factors for risky sexual behaviours among Ugandan university students**

The wide range of factors that can lead to risky sexual behaviour among young people include socio-demographic ones like area of origin, educational level of head of the household, and religion. Gender differences have been observed regarding this association in a sub-Saharan African setting [42, 43]. According to a survey conducted among students from six Ugandan universities, there is a high prevalence of risky sexual behaviours in this population: 51% used a condom during their last sexual intercourse (higher than the national average), 9% currently use contraception other than male contraceptives, 24% have had more than one sexual partner in the last 12 months, 79% have had a non-regular partner, and 10% had an STI-related symptom [44]. The study further reported that 6% of all sexually active girls ages 15 to 19, and 13% ages of those 20 to 24 have at some time been pregnant, and 4.2% have had an induced abortion. Unwanted pregnancies are an important public health concern as they can have long-term psychosocial and economic implications, which in turn can also lead to students dropping out of university.

There is evidence from prior research conducted among adolescents in Uganda, Malawi, Ghana, and Burkina Faso that a large number of unintended pregnancies result from lack of awareness of contraceptive methods, their source of availability, and from an array of social and structural inequalities that compromise sexual decision making [45]. Some of the prominent factors that lead to a risk of unintended pregnancies are multiple concurrent relationships, cross-generational sex, transactional sex, and sexual violence [46, 47], all of which are prevalent in Ugandan universities [44].

Alcohol consumption is widely known to be one of the risk factors that may lead to risky sexual behaviours and the threat of sexual coercion [48-52]. There is evidence from a previous study conducted among university students in the US showing that, despite being a high income country, nearly 50% of all cases of sexual coercion there involves the use of alcohol or other drugs by the victim or the perpetrator [50]. Alcohol consumption in Ugandan universities is considered to contribute to cases of sexual coercion, including rape, both on and off campus [53].

In the Ugandan context, alcohol consumption may be a part of the control mechanism that is used to obtain sex without the consent of the other person [54]. Sexual coercion may not allow the victim to negotiate safer sex, thus leading to risky sexual behaviours. There are various theories that have been discussed in relation to alcohol and sex such as alcohol disinhibition [55]. Another is alcohol myopia theory, [56] which is explained as the restriction of cognitive capacity where the person focuses on the salient situational cues of sexual initiation and ignores the peripheral ones. This suggests that alcohol consumption in an initiate situation, when the arousal is high it may limit a person's ability to identify potential dangers, including the risk of STI, unwanted pregnancy, or sexual coercion.

Another potential risk factor that may lead to risky sexual practices among this population may be academic performance. University students undergo great deal of psychological pressure. As a result they may resort to coping mechanisms like risky sexual behaviours, alcohol consumption, and drug use to release their stress [57-59]. There is evidence from studies conducted on adolescents in the US that show that students with a low grade point average (GPA) have a higher likelihood of teenage pregnancy than those with a high GPA who tend to postpone their pregnancies until their 20s [60]. Another study conducted among high school students found a low GPA associated with a high number of sexual partners and lower condom use [61]. It could also be argued that poor academic performance may lead to risky sexual behaviour because, due to the psychological stress such individuals may not be able to do a good risk assessment of interpersonal situations [61]. This may also be due to reduced motivation to pursue one's academic career and therefore more time spent on social activities.

Low condom efficacy is known to be another potential risk factor that could lead to non-use of condoms. There are various studies in sub-Saharan Africa that have documented this association [62, 63], but the gender differences in this regard have not been well investigated. There are certain individual and social factors (peer norms) that can affect this association among young people. Perceived self-efficacy is one of the individual determinants that can influence condom use. This concept is derived from social cognitive theory and is one of the components that could potentially lead to health-related behavioural change [64]. Perceived self-efficacy has been described as the confidence in one's ability to demonstrate motivation and capability to achieve a given goal [65]. Condom efficacy is therefore one's ability to successfully use a condom during sexual intercourse [66]. However, it requires risk reduction strategies and self-regulation skills to transform condom efficacy into behaviour, which in difficult circumstances can be a challenge for young university students [67].

In the Ugandan context, where gendered cultural norms and inequitable power relations prevail, women have less control in a sexual relationship [11]. Interpersonal

communication along with behavioural skills between partners is an integral part of a relationship that determines behaviour [68, 69]. There is evidence from prior research that demonstrates having a positive attitude towards condoms and a greater confidence in one's ability to use them consistently in various circumstances corresponds to higher levels of condom use [70, 71].

'Intention to use a condom' is another predictor that can affect condom use [72, 73]. According to planned behaviour theory [74] and its extended versions [75], any behaviour is more likely to occur if there is a strong intention to carry it out, in the absence of environmental barriers. Uganda has inequitable gender power relations: women possess less control so just having the intention to use a condom might not translate into behaviour [11].

Along with individual factors many social factors affect condom use. Evidence from previous studies conducted in the US among university students, demonstrates that peer norms towards alcohol consumption, romantic relationships, and sexual behaviours can put pressure on young people, affecting their sexual decisions [76-78]. Young people who feel this is normative behaviour among their peers might engage in having multiple sexual partners, using condoms inconsistently, and consuming alcohol in conjunction with having sex [78]. This is further supported by studies of adolescents in Ethiopia, Cambodia, and Laos, where peer influences have been shown to affect risky sexual practices [79, 80].

Therefore, it is important that we take into account these risk factors in addressing the socio-cultural factors particularly gender inequalities in Uganda, which will help in reducing the negative reproductive health outcomes such as unintended pregnancies, STIs and abortions, including feminization of the HIV epidemic in this region.

### **Conceptual Framework : The social-ecological model**

The model presented in Figure 1 is an adaptation of Bronfenbrenner's ecological model [81], previously used to understand factors for risky sexual behaviour among young people [82]. It depicts four levels that correspond to our analysis. These factors interact with one another on the individual, relationship, community and societal levels. The first level, the individual, includes psychological characteristics and various high risk behaviours that affect health. The second level, relationships, comprises an individual's proximal relations such as family, intimate partners, and peers, which among vulnerable young people can influence a person's behaviour positively or negatively. The third level is community, encompassing a person's social capital in which he/she develops social networks in various settings like a university, workplace, and neighbourhood. The outermost layer covers the broad societal factors including

religion, politics, policies, social norms, gender norms, and media, all of which have a potent effect on young people's sexual behaviours. Gender norms seem to be pervasive across all levels. The multiplicity of these factors shape young people's sexual behaviours.

The sexual behaviour of young people has largely been viewed as an individual level phenomenon [82]. Consequently, many intervention efforts have been made to understand factors that influence sexual decision making, but they have not addressed the pervasive contextual influences like gender and social norms which directly or indirectly affect individual behaviours [82]. Therefore, individual level interventions over longer periods of time or in the presence of these countervailing forces might not change into behaviour. Therefore, it is crucial to understand sexual risk behaviours of young people in a broader perspective.

A conceptual framework that addresses the complexity of factors that affect risky sexual behaviours, including sexual coercion, among Ugandan university students in our thesis is given below.

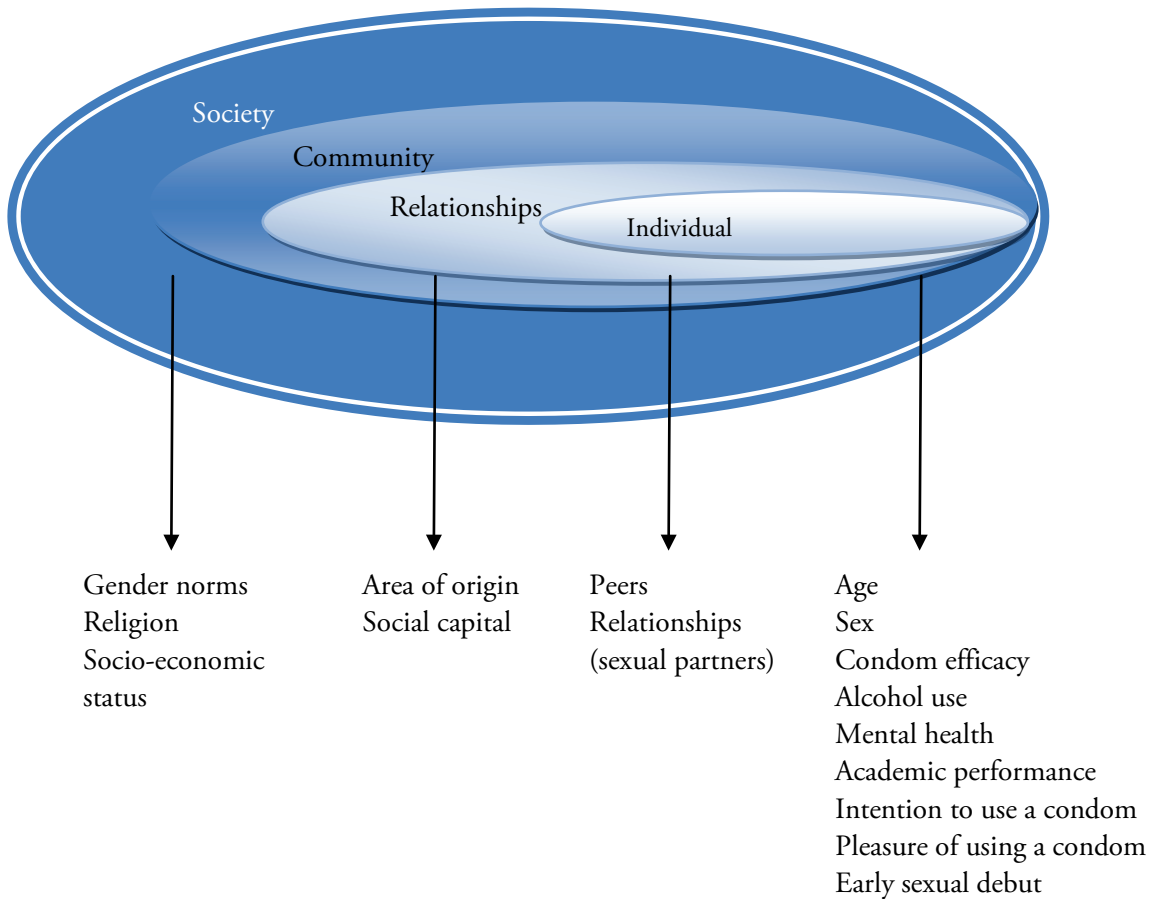


Figure 1. An adaptation of the social-ecological model: individual, relationship, community, and society (Bronfenbrenner 1977)

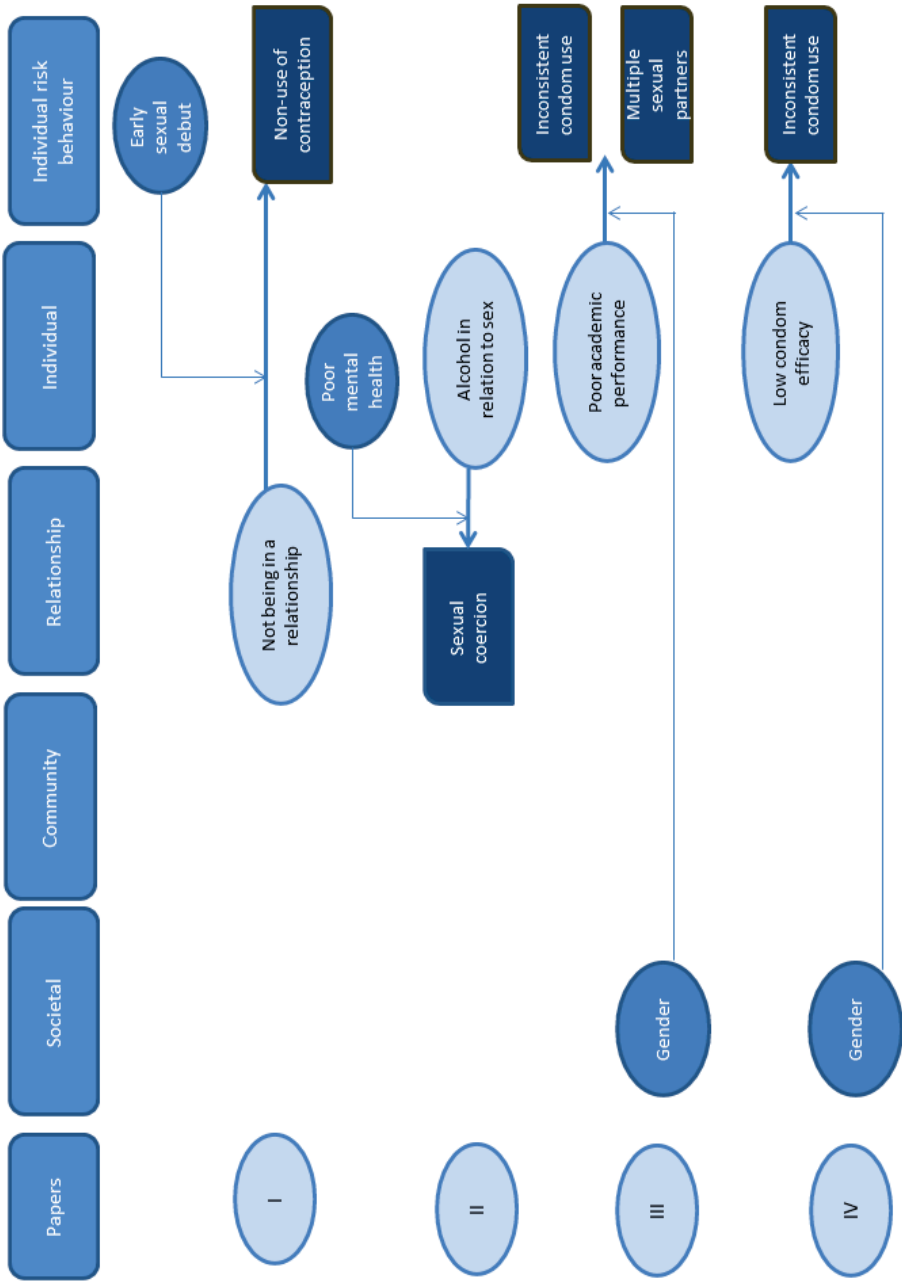


Figure 2. Effect modification analysis in studies I-IV

Previous studies have described risk factors for unsafe sexual behaviour among young people in Uganda, but gender differences in a university population have not been very well investigated. Moreover, to the best of our knowledge there is no previous research on issues like academic performance and how this affects risky sexual behaviour in a university population in this region. This thesis examines socio-demographic factors, alcohol consumption, academic performance, and condom efficacy and analyzes how they are associated with risky sexual behaviours, including the risk of sexual coercion, from a gender perspective. Understanding these dynamics will enable culturally sensitive recommendations to be made regarding strategies that can meet the sexual and reproductive health needs of young people.



# Aims

## **General Aim**

The overall aim of this thesis was to gain a deeper understanding of the various factors that have an association with risky sexual behaviours among Ugandan university students, focusing on a gender perspective. This knowledge can contribute to effective policy formulation and implementation of programs.

## **Specific Aims**

1. To determine the relationship between non-use of contraception and socio-demographic factors, alcohol consumption, and types of partner(s) among Ugandan university students (Study I)
2. To study the association between alcohol consumption and the experience of sexual coercion among Ugandan university students (Study II)
3. To investigate the association between self-reported academic performance and risky sexual behaviours, and whether gender affects this relationship among Ugandan university students (Study III)
4. To investigate whether gender differences regarding individual and social factors determine the association between condom efficacy and inconsistent condom use with a new sex partner among Ugandan university students (Study IV)

# Material and Methods

The four studies in this thesis are based on data collected through a self-administered questionnaire distributed among all the undergraduate students at Mbarara university of Science and Technology (MUST) in 2010.

## **Study design and setting**

The study adopted a cross-sectional study design. The survey was conducted at (MUST), the second largest university in Uganda, a public institution that was founded in 1989. It is located in the centre of Mbarara, approximately 350 kms to the southwest of the capital city, Kampala. In 2010, the number of universities in Uganda expanded, resulting in 29 new institutions of higher learning. Many more students are now being enrolled in universities than in the past. Those receiving government scholarships remain in campus during their course of study, while others live on campus during their first and second years and then move on to privately run hostels.

Our target population consisted of undergraduate students from the university's four faculties: Science, Medicine, Computer Science, and Development Studies. The total sample was comprised of 2706 individuals, of whom 1954 participated in the study (72% of all registered undergraduates). The respondents included 1087 males (55.6%) and 867 females (44.4%). Ethics approval for the project was granted by the Institutional Review Committee at MUST.

## **Data collection and analysis**

The data was collected by means of an 11 page self-administered questionnaire with 132 questions based on socio-demographic factors, academic progress, social capital, mental health, sexual behaviour, alcohol consumption, and other lifestyle variables. The questionnaire was developed on the basis of a pilot study conducted among young people at the university which was in turn based on prior focused group discussions among students. The approximate time used for filling in the questionnaire was 45 minutes. The language used in this survey was English. The same questionnaire has also been used in previous studies of university students in this setting [19, 83, 84].

The entire undergraduate student body at MUST was invited to take part in the survey. Prior to the questionnaire distribution, a consent form was circulated describing the purpose of the study, and students were asked to sign if they agreed to participate. The research team informed the students that participation in the survey was voluntary and anonymity would be assured. The contact details of the project's principal investigator and the research assistant were provided in case students had any personal questions. The signed consent forms and completed questionnaires were deposited by each student in a sealed box.

Table 2. Overview of the thesis studies, population, aims, study design and statistical analysis

Study	Inclusion criteria	Aims	Study Design	Statistical analysis
I	The total study sample comprised 1954 students. For this study we analyzed only 1179 individuals who had sexually debuted, since the outcome was contraceptive use	The aim of our study was to determine the relationship between socio-demographic factors, alcohol consumption, and types of partner(s) with non-use of contraception among Ugandan university students	Cross-sectional	Descriptive statistics, bivariate, multivariate logistic regression, and effect modification analysis
II	All those who responded to the questionnaire were included in this study (1954 students)	The aim was to study the association between alcohol consumption and the experience of sexual coercion among Ugandan university students	Cross-sectional	Descriptive statistics, bivariate, multivariate logistic regression, and effect modification analysis
III	The total study sample comprised 1954 students. We analyzed only 1179 individuals who had sexually debuted, since the outcome was multiple sexual partners and condom use	The aim of this study was to investigate the association between self-reported academic performance and risky sexual behaviours, and whether gender affected this relationship among Ugandan university students.	Cross-sectional	Descriptive statistics, bivariate, multivariate logistic regression, and effect modification analysis
IV	The total sample comprised 1954 students, for this study. We analyzed only 1179 individuals who had sexually debuted, since the outcome was regarding condom use	The aim of this study was to investigate whether gender differences regarding individual and social factors determine the association between condom efficacy and inconsistent condom use with a new sex partner among Ugandan university students	Cross-sectional	Descriptive statistics, bivariate, multivariate logistic regression, and effect modification analysis

## Measures

### Background variables

*Sex* was classified into male or female (Studies I to IV).

*Age* was a continuous variable that was dichotomized into  $\leq 22$  ('younger') and  $> 22$  ('older') using mode as the cutoff point in Study I and median in Study II (which used the entire sample). In Studies III and IV we used 23 as the cut-off point, since only students who had sexually debuted were analyzed.

*Area of growing up* was dichotomized into rural or urban, the latter combining peri-urban and small towns (Studies I to IV).

*Educational level of head of the household* during childhood was categorized as 'did not complete primary school' and 'completed primary school', which were coded as  $\leq$  Primary education and  $>$  Primary education (Studies I to IV).

*Religious affiliation during childhood* was categorized as Catholic, Protestant, Moslem, Pentecostal, Seventh-Day Adventist, Orthodox, and Other. The variable was then trichotomized as Catholic, Protestant, and Other since the first two were the major religions in our study sample and the remaining denominations were too small to be analyzed separately (Study I).

*The role of religion* in family life while growing up was dichotomized into major ('religion played a big role or was relatively important') and minor ('religion was not so important or was not important at all') (Studies I to IV).

*Number of boyfriends/girlfriends you have had* was dichotomized into 0–1 and  $\geq 2$  partners while 'Boyfriend/girlfriend at the moment' was categorized as 'Yes' or 'No', as in the questionnaire, and referred in the study as 'currently in a relationship' (Study I).

*Length of the current relationship* was dichotomized into  $\leq 1$  year or  $> 1$  year. (Study I).

*Type of partner* was a dummy variable combining, 'number of boyfriend/girlfriends you have had' and 'number of lifetime sexual partners'. It was then categorized as 'irregular partners', 'regular partners' and 'mixed partners' (Study I).

The definition of irregular partners was used for individuals who reported having had no girlfriends/boyfriends and one or more sexual partners or individuals reporting two or more sexual partners in excess of the number of girlfriends/boyfriends they reported.

The definition of regular partners was based on an individual reporting having had one girlfriend/boyfriend and one sexual partner, or who had more girlfriends/boyfriends than sexual partners.

The definition of mixed partners was based on an individual reporting having had two or more sexual partners and an equal number of girlfriends/boyfriends, or one more sexual partner than girlfriends/boyfriends.

*Age at sexual debut* was dichotomized into  $\geq 16$  years and  $< 16$  years. (Studies I and III).

*'Number of sexual partners in the past 12 months'* was determined by the response to the question: 'How many sexual partners have you had in the past 12 months?' The variable was dichotomized into 0 to 1 or  $\geq 2$  partners (Studies I, III and IV)

#### Alcohol consumption variables

*Alcohol consumption in the past 12 months* was assessed by asking 'How often have you consumed alcohol in the last 12 months?' There were five alternative responses: four times per week or more, two to three times per week, three to four times per month, once a month or less, or never. The variable was then dichotomized into 'risk' for the first three alternatives and 'no risk' for the last two (Study I). This was a dichotomous variable, used only as a confounder in this study and not our main exposure. The variable was then trichotomized into 'abstainers' (never), 'infrequent users' (three to four times per month, once a month or less) and 'frequent users' (four times per week or more often; two to three times per week) (Study II). Since it was the main exposure of our study, we trichotomized this variable. Therefore, it did not affect the outcome for a better estimation of results.

*Consumption of alcohol on your latest occasion of sexual intercourse* was categorized as 'Yes' and 'No', as in the questionnaire (Studies I and II).

*Alcohol consumption on the occasion of sexual intercourse* had the following response alternatives: always, or almost always, more often than on half of the occasions; about half of the occasions; more seldom than on a quarter of the occasions; almost never; or never. The first three options were coded as 'frequent consumers of alcohol on the occasion of sexual intercourse' and the last two as 'infrequent users of alcohol on the occasion of sexual intercourse' (Studies II, III and IV).

*Heavy episodic drinking* (HED) was based on the question "How often do you drink six glasses or more on the same occasion?" The following alternative answers could be selected: daily or almost daily; every week; every month; more seldom than once a month; or never. The variable was then trichotomized into 'abstainers' (never), 'frequent HED' (daily or almost daily; every week; every month) and 'infrequent HED' (more seldom than once a month; never). We used alcohol consumption over the past 12 months as the main exposure instead of HED, as the trends were quite similar (Study II).

## Mental health

The Hopkins Symptom Check List (HSCL-25) was used to assess the mental health status of participants in the survey. This scale consists of 15 items analysing symptoms of depression and 10 items assessing symptoms of anxiety during the week prior to the survey [85]. An additional, 10 items from the Symptom Checklist-90 (SCL 90) were included to measure symptoms of psychoticism during the past week prior to the survey. Each item was graded on a four point Likert scale [86]. Both instruments mentioned have been validated and applied in different African cultural contexts [52, 87, 88].

The total mean mental health scores as well as the mean scores of depression, anxiety and psychoticism were calculated from each student's total score for each measure. Scores were divided by the number of items for all the responses and dichotomized into 'high score' and 'low score', based on the median split between the total scores for each measure. These variables are referred to in the manuscript as 'poor mental health' and 'good mental health', respectively (Studies II and III).

## Sexual coercion

*Experience of sexual coercion* was measured by means of a validated instrument that had been used in previous studies of sexual behaviour [89, 90]. Experience of sexual coercion was based on responses to the following statements: 'You have been forced to show your sexual organ', 'Someone forced you to let them touch your sexual organ', 'Someone forced you to let them suck or lick your sexual organ', 'Someone forced you to let them show you their sexual organ', 'You have been forced to watch someone masturbate', 'You have been forced to masturbate someone', 'You have been forced to take part in oral sex or to lick someone's sexual organ', 'You have been forced to take part in sexual intercourse with the penis in the vagina or someone has inserted an object into your vagina', or 'You have been forced to pose for a sex photo or sex film'. If the respondent answered affirmatively to any of these alternatives, they were classified as being exposed to sexual coercion and coded as 'Yes', otherwise they were coded as 'No' (Study II).

*Early experience of sexual coercion* was assessed by combining the variables 'Age at first time of sexual coercion' and 'Current experience of sexual coercion'. We coded all those who reported being coerced before age 18 but were not currently being exposed to coercion as 'early experience of sexual coercion' (Study II).

## Academic achievement variables

*Academic performance* was based on the question 'How well are your studies going?' A response could be chosen from the following: 'My studies are going well'; 'My studies are going reasonably well'; 'My studies are not going as well as I wish'. The variable was then dichotomized so that the first two options were coded as 'good academic performance' and the last as 'poor academic performance' (Study III).

*Academic year* was determined by the question: 'In what year of your studies are you currently?' The variable was dichotomized into '1<sup>st</sup> year' and '> 1<sup>st</sup> year' for those in years 2 to 5 (Study III).

## Social capital variables

*Trust in others* was measured on the basis of answers to questions that are widely used in empirical studies [91]: 'Most people would take advantage of you if they had an opportunity'; 'Most people try to be fair'; 'You can trust most people'; and 'You



cannot be careful enough when dealing with other people.’ The response alternatives were ‘I do not agree at all,’ ‘I do not agree,’ ‘I agree,’ or ‘I agree completely’. They were assigned values from 1 to 4, with a maximum total score of 16. On the basis of the median score, the variable was categorized into ‘high’ (above the median) and ‘low’ (below the median) (Study III).

*Social participation* was defined on the basis of 12 different social activities in which students may have participated over the previous few months. A validated measure used for this had previously been employed in Sweden [92]. The variable was dichotomized on the median value: the total scores of those who answered ‘yes’ (maximum total score 12) were coded into ‘high’ (above the median) and ‘low’ (below the median) (Study III).

*Condom efficacy* was assessed by combining two statements: ‘I am satisfied with my ability to use a condom correctly’ and ‘I believe I can persuade a new sex partner to use a condom’. The respondents who indicated ‘Yes’ to both statements were coded as ‘high efficacy’ and other responses were categorized as ‘low efficacy’ (Study IV).

*Pleasure of using a condom* was based on the question ‘How would you compare the degree of pleasure in using a condom during intercourse with not using one?’ The responses ‘no difference’ and ‘more pleasure with a condom’ were coded as: ‘same or more pleasure’; ‘less pleasure’ remained coded as ‘less pleasure’ (Study IV).

*Intention to use a condom* was based on the statement ‘I intend to use a condom whenever I have intercourse with a new sex partner’. Those who responded positively were coded as ‘Yes’ and others were classified as ‘No’ (Study IV).

## Peer norms

*Peers use a condom with a new sex partner* was based on the statement ‘My friends at the university always use a condom with a new partner’. The response alternatives were ‘Yes’ or ‘No’ (Study IV).

*Peers having difficulty demanding condom use* was based on the statement ‘My friends at the university have difficulty demanding condom use with a new partner’. The response alternatives were ‘Yes’ or ‘No’ (Study IV).

## Dependent variables

Prevention of unwanted pregnancy was assessed through responses to the question: 'Did you use any method for avoiding pregnancy on your latest occasion of sexual intercourse?' There were four alternative answers: no; yes, a condom; yes, a contraceptive pill; or yes, another method. The variable was then dichotomized so that all of the 'Yes' answers were considered as 'Yes' (Study I).

*Recent experience of sexual coercion* was based on the response to two questions: 'How old were you when the coercive experience happened for the first time' and 'Is it still going on?' We classified all those who reported that their first experience of sexual coercion happened at age 18 or above, or below 18 years but is still going on, as exposed to a recent experience of sexual coercion (Study II).

*Multiple sexual partners* was ascertained by the response to the question 'How many sexual partners have you had during the last 12 months?' and was dichotomized into '0 to 1' and  $\leq 2$ . Students who responded  $\leq 2$  partners were classified as having multiple sexual partners (Study III).

*Inconsistent condom use* was ascertained by asking 'How often do you use a condom with a new sexual partner?' The response option 'always' was coded as 'consistent condom use' and the other alternatives ('often', 'sometimes', 'never', 'does not apply to me') were coded as 'inconsistent condom use' (Study III and IV).

## Statistical methods

Statistical analysis was conducted using PASW (SPSS) statistical package Version 21.0. We first measured the prevalence of the variables we used within our sample population. Logistic regression analysis then calculated the crude odds ratio (OR) with 95% confidence intervals (CI) for investigating the associations between the potential determinants and non-use of contraception (Study I); to investigate the associations between alcohol consumption patterns and recent experience of sexual coercion (Study II); to study the association between self-reported academic performance regarding multiple sexual partners and inconsistent condom use (Study III); and to determine the association between condom efficacy and inconsistent condom use with a new sexual partner (Study IV).

Multivariate logistic regression was used step-wise to adjust for potential confounders in our studies. These were age, sexual debut, area of origin, and educational level of

head of household (Study I); sex, age, area of origin, educational level of head of the household and mental health (Study II); sex, age, area of origin, social participation, mental health, alcohol use on the occasion of sexual intercourse, and sexual debut (Study III); and age, area of origin, pleasure of using a condom, intention to use a condom, multiple sex partners, alcohol in relation to sexual intercourse, and peer norms (Study IV). The analysis in Study I was performed separately for males and females, whereas in Studies II, III, and IV were adjusted for sex. The significance level was accepted at  $p < 0.05$ , two tailed.

To further investigate the associations we analyzed the estimates of effect modification (synergy) ‘departure from additivity of effects on the chosen outcome scale’ and calculated the synergy index (SI) to disclose effect modification between the chosen variables (Studies I to IV), as proposed by Rothman and Greenland [93].

The following algorithm was used in which  $SI > 1$  signifies a synergistic effect (representing a positive effect modification) and  $SI < 1$  an antagonistic effect (representing a negative effect modification):

$$SI = \frac{(OR_{(1+1)} - 1)}{(OR_{(1+0)} - 1) + (OR_{(0+1)} - 1)}$$

where:

$OR_{(1+1)}$  = odds ratio for dummy variable exposed to both factors

$OR_{(1+0)}$  = odds ratio for dummy variable exposed to one factor

$OR_{(0+1)}$  = odds ratio for dummy variable exposed to other factor

$OR_{(0+0)}$  = odds ratio for dummy variable unexposed to both factors

Significant effect moderation between two variables indicates that when both are present there is an amplified effect, i.e., the combination of the two indicators has a stronger effect, which is higher than added effect of the variables in question.

# Results

The total sample comprised 2706 individuals, of whom 1954 participated in the study (72% of all registered undergraduates). The respondents included 1087 males (55.6%) and 867 females (44.4%).

Table 3 describes the socio-demographic factors, sexual behaviour variables, alcohol consumption, mental health, and outcome variables of risky sexual behaviours (contraceptive method used on latest occasion of sexual intercourse, recent experience of sexual coercion, inconsistent condom use, and number of sexual partners in the last 12 months).

A majority of females (63.1%) in our sample were younger than age 22. Fewer, males (49.6%) were under 22. Nearly 40% of the females grew up in a rural environment, whereas the corresponding percentage for males was 49%. A larger proportion of females (77.5%) came from a background in which the educational level of the head of household was above primary education. This was only true of 68.9% of the males. Sixty-three percent of those in our sample stated that religion played a major role in their family of origin. Nearly 31% of the males reported that they had debuted sexually at age 16 or before, whereas only 14.2% of the females stated the same. A considerable percentage of males (22.5%) and females (33.9%) reported an experience of sexual coercion.

More females (21%) than males (17%) did not use contraception on their most recent experience of sexual intercourse. Inconsistent condom use with a new sex partner was higher in females (49.2%) than in males (37.4%). The prevalence of multiple sex partners over the last 12 months among males (41.3%) was almost double that of females (22.5%). More males (66.2%) had previously had sex compared to females (60%). Almost, 23% of the males said they frequently consumed alcohol in relation to sex; the prevalence was lower in females (17%). Frequent consumption of alcohol over the last 12 months was again higher in males (11%) than in females (6.2%).

Table 3. Prevalence of socio-demographic factors, alcohol consumption, mental health, and risky sexual behaviours among Ugandan university students

	All n (%)	Male n (%)	Female n (%)	X P-value
Age	1954 (100%)	1087 (55.6%)	867 (44.4%)	
	≤ 22	521 (49.6)	521 (63.1)	< .001
	> 22	530 (50.4)	305 (36.9)	
	Missing	36	41	
Area of growing up	1067 (55.1)	551 (51.2)	516 (60.1)	< .001
	Urban	526 (48.8)	343 (39.9)	
	Rural	10	8	
	Missing	18		
Educational level of head of household	1382 (72.7)	730 (68.9)	652 (77.5)	< .001
	> Primary education	329 (31.1)	189 (22.5)	
	≤ Primary education	28	26	
	Missing	54		
Religious affiliation	749 (38.6)	420 (39)	329 (38.1)	.417
	Catholic	908 (46.8)	415 (48.0)	
	Protestant	119 (6.1)	51 (5.9)	
	Muslim	93 (4.8)	43 (5.0)	
	Pentacostal	41 (2.1)	16 (1.9)	
	Seventh Day Adventist	11 (0.6)	6 (0.7)	
	Orthodox	19 (1.0)	4 (0.5)	
	Other	14	3	
	Missing	11		
	Missing	14		
Importance of religion	1232 (63.5)	650 (60.3)	582 (67.5)	.001
	Major	428 (39.7)	280 (32.5)	
	Minor	9	5	
	Missing	14		
Age at sexual debut	255 (24.0)	194 (30.6)	61 (14.2)	< .001
	≤ 16	439 (69.4)	369 (85.8)	
	> 16	60	(56)	
	Missing	116		
Mental health	920 (50.4)	549 (54.5)	371 (45.5)	< .001
	Good	459 (45.5)	445 (54.5)	
	Poor	79	51	
	Missing	130		

Experience of sexual coercion	Yes	431 (27.6)	193 (22.5)	238 (33.9)	< .001
	No	1130 (72.4)	665 (77.5)	456 (66.1)	
	Missing	393	229	164	
Contraceptive use on latest occasion of sexual intercourse <sup>1</sup>	Yes	869 (81.4)	520 (83.1)	349 (79.0)	.094
	No	199 (18.6)	106 (16.9)	93 (21.0)	
	Missing	111	67	44	
Condom use with a new sex partner <sup>1</sup>	Consistent	603 (57.8)	387 (62.6)	216 (50.8)	< .001
	Inconsistent	440 (42.2)	231 (37.4)	209 (49.2)	
	Missing	136	75	61	
Sexual partners over the last 12 months <sup>1</sup>	0-1	680 (66.4)	356 (58.7)	324 (77.5)	< .001
	≥ 2	344 (33.6)	250 (41.3)	94 (22.5)	
	Missing	155	87	68	
Previously had sex	Yes	1179 (63.5)	693 (66.2)	486 (60.0)	.006
	No	678 (36.5)	354 (33.8)	324 (40.0)	
	Missing	97	40	57	
Alcohol consumption on the occasion of sexual intercourse <sup>1,2</sup>	Seldom	391 (79.0)	245 (76.6)	146 (83.4)	.084
	Frequently	104 (21.0)	75 (23.4)	29 (16.6)	
	Missing	95	68	27	
Alcohol consumption over the last 12 months	Abstainers	1017 (56.2)	514 (49.9)	503 (64.5)	< .001
	Infrequent users	632 (34.9)	403 (39.1)	229 (29.4)	
	Frequent users	161 (8.9)	113 (11.0)	48 (6.2)	
	Missing	144	57	87	

<sup>1</sup>Only analyzed for those individuals who had sexual intercourse

<sup>2</sup>Only analyzed for those individuals who consumed alcohol

## Study I

The aim of this study was to determine the relationship between socio-demographic factors, alcohol consumption, and types of partner(s) with non-use of contraception among Ugandan university students.

A total of 1,179 students (60.3% of the study population) reported that they had debuted sexually. Of these, 199 (18.6%) had not used contraception in their last sexual encounter. In the bivariate analysis we found an association between who were not currently in a relationship and non-use of contraception. This association continued to be statistically significant in the multivariate analysis among both males and females, even after adjusting for age, sexual debut, area of growing up, and educational level of head of household (Table 4). The socio-demographic determinants of age (22 or younger), early sexual debut (16 years or younger), and rural background were significant for males, but not for females. To further investigate the association, sexual debut was analyzed as an effect modifier. A synergistic effect was found between those not currently in a relationship and early sexual debut in its bearing on non-use of contraception among males and females (Table 5).

Table 4. Association (OR, 95% CI) between socio-demographic factors, sexual behaviour, and non-use of contraception among Ugandan university students in 2010

<i>All</i>				
	Model 1	Model 2	Model 3	Model 4
Currently not in a relationship	<b>1.8 (1.2–2.8)</b>	<b>1.8 (1.2–2.7)</b>	<b>1.8 (1.9–2.7)</b>	<b>1.8 (1.2–2.7)</b>
≤ 22 years		<b>1.3 (0.9–1.8)</b>	<b>1.3 (0.9–1.8)</b>	<b>1.5 (1.1–2.1)</b>
Early sexual debut			<b>1.5 (1.0–2.2)</b>	<b>1.6 (1.1–2.3)</b>
Rural				<b>2.0 (1.3–3.0)</b>
Low education level of head of household				1.3 (0.9–1.9)
<i>Males</i>				
	Model 1	Model 2	Model 3	Model 4
Currently not in a relationship	<b>1.8 (1.1–2.9)</b>	<b>1.7 (1.0–2.8)</b>	<b>1.7 (1.0 – 2.8)</b>	<b>1.7 (1.0–2.8)</b>
≤ 22 years		<b>1.6 (1.0–2.6)</b>	<b>1.6 (1.0–2.5)</b>	<b>1.9 (1.2–3.1)</b>
Early sexual debut			<b>1.6 (1.0–2.6)</b>	<b>1.7 (1.1–2.7)</b>
Rural				<b>2.2 (1.3–3.8)</b>
Low educational level of head of household				1.2 (0.7–2.0)
<i>Females</i>				
	Model 1	Model 2	Model 3	Model 4
Currently not in a relationship	<b>2.1 (1.1–4.2)</b>	<b>2.1 (1.1–4.3)</b>	<b>2.1 (1.1 – 4.3)</b>	<b>2.1 (1.1–4.2)</b>
≤ 22 years		1.0 (0.6–1.7)	1.0 (0.6 – 1.6)	1.0 (0.6–1.8)
Early sexual debut			1.6 (0.8–3.2)	1.6 (0.8–3.2)
Rural				1.3 (0.8–2.2)
Low education level of head of household				1.4 (0.8–2.6)



Table 5. Analysis of effect modification between sexual debut and current relationship status regarding non-use of contraception in a sample of Ugandan university students (n = 1,179), presented as adjusted Odds Ratios (OR) with 95% Confidence Intervals (CI)

Non-use of contraception	All n (%)	OR (95% CI)	Male n (%)	OR (95% CI)	n (%)	Female OR (95% CI)
In a relationship / Late sexual debut	719 (63.5)	1	374 (56.1)	1	345 (74.2)	1
Not in a relationship / Late sexual debut	163 (14.4)	1.4 (0.9–2.2)	103 (15.4)	1.2 (0.7–2.3)	60 (12.9)	1.8 (0.9–3.5)
In a relationship / Early sexual debut	191 (16.9)	1.0 (0.6–1.5)	141 (21.1)	1.1 (0.6–1.9)	50 (10.8)	0.9 (0.4–1.9)
Not in a relationship / Early sexual debut	59 (5.2)	<b>4.6 (2.5–8.1)</b>	49 (7.3)	<b>3.9 (1.9–7.7)</b>	10 (2.2)	<b>17.5 (3.6–84.7)</b>
Missing	(47)		(26)		(21)	
Total	1,179		693		486	

### Conclusion

We found an association between those who were not in a relationship and non-use of contraception. The socio-demographic factors that affected this association differed for males and females. Early sexual debut modified the effect of this association.

## Study II

The aim was to study the association between alcohol consumption and the experience of sexual coercion among Ugandan university students.

Of the 1954 students, we surveyed, 27.6% reported having experienced sexual coercion and 16.4% stated that they had had such an experience recently. Alcohol consumption over the past 12 months had a significant association with recent experience of sexual coercion for males (OR crude 2.14, 95% CI 1.38–3.32) and females (OR adjusted 2.29, 95% CI 1.40–3.72). The multivariate analysis indicated that there was possible confounding between alcohol consumption and poor mental health. It was also found that females older than 23 years were at a greater risk for being sexually coerced (Table 6).

The association between alcohol consumption on the occasion of sexual intercourse and recent experiences of sexual coercion showed considerable gender differences. Females had a higher risk (OR crude 5.65, 95% CI 2.24–14.22) compared to males (OR crude 2.53, 95% CI 1.27–5.05). This association remained significant even after adjusting for confounders (OR adjusted 1.79, 95% CI 1.05–.04) (Table 7).

To further investigate the association between alcohol consumption and recent experience of sexual coercion, we sought to determine whether mental health was an effect modifier and found that frequent alcohol use on the occasion of sexual intercourse in combination of poor mental health had a synergistic effect on recent experience of sexual coercion (Table 8).

Table 6. Association (Adjusted Odds Ratio OR, 95% Confidence Interval CI) between alcohol consumption over the past 12 months and recent experience of sexual coercion among Ugandan university students

	Model 1 OR (95 % CI)	Model 2 <sup>1</sup> OR (95% CI)	Model 3 <sup>2</sup> OR (95 % CI)	Model 4 <sup>3</sup> OR (95 % CI)	Model 5 <sup>4</sup> OR (95 % CI)	Model 6 <sup>5</sup> OR (95 % CI)
Alcohol consumption in the past 12 months						
Abstainers	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)	1 (Ref)
Infrequent users	.98 (.71–1.36)	1.09 (.79–1.52)	1.09 (.79–1.52)	1.11 (.80–1.55)	1.12 (.80–1.56)	1.02 (.72–1.43)
Frequent users	<b>2.12 (1.34–3.33)</b>	<b>2.62 (1.64–4.18)</b>	<b>2.61 (1.63–4.17)</b>	<b>2.68 (1.67–4.29)</b>	<b>2.73 (1.70–4.39)</b>	<b>2.29 (1.40–3.72)</b>
Female		<b>2.30 (1.70–3.11)</b>	<b>2.48 (1.82–3.38)</b>	<b>2.53 (1.85–3.45)</b>	<b>2.57 (1.88–3.51)</b>	<b>2.37 (1.72–3.25)</b>
> 22 years			<b>1.62 (1.20–2.19)</b>	<b>1.56 (1.15–2.11)</b>	<b>1.53 (1.13–2.08)</b>	<b>1.64 (1.20–2.23)</b>
Rural				1.30 (.96–1.76)	1.21 (.88–1.67)	1.17 (.84–1.62)
Low educational level of head of household					1.25 (.88–1.76)	1.08 (.76–1.54)
Poor mental health						<b>3.14 (2.25–4.37)</b>

<sup>1</sup>Model 2 adjusted for sex

<sup>2</sup>Model 3 adjusted for sex and age

<sup>3</sup>Model 4 adjusted for sex, age, area of origin

<sup>4</sup>Model 5 adjusted for sex, age, area of origin and educational level of head of household

<sup>5</sup>Model 6 adjusted for sex, age, area of origin, educational level of head of household, and mental health

Table 7. Association (Adjusted Odds Ratios OR, 95% Confidence Interval CI) between alcohol consumption on the occasion of sexual intercourse and recent experience of sexual coercion among Ugandan University students

	Model 1 OR (95 % CI) 1 (Ref)	Model 2 <sup>1</sup> OR (95 % CI) 1 (Ref)	Model 3 <sup>2</sup> OR (95 % CI) 1 (Ref)	Model 4 <sup>3</sup> OR (95 % CI) 1 (Ref)	Model 5 <sup>4</sup> OR (95 % CI) 1 (Ref)	Model 6 <sup>5</sup> OR (95 % CI) 1 (Ref)
Frequency of alcohol on the occasion of sexual intercourse						
Infrequent users						
Frequent users	<b>2.95 (1.7–5.12)</b>	<b>3.18 (1.82–5.57)</b>	<b>3.14 (1.79–5.51)</b>	<b>3.17 (1.81–5.57)</b>	<b>3.21 (1.82–5.65)</b>	<b>2.78 (1.56–4.97)</b>
Female	<b>1.88 (1.14–3.10)</b>	<b>1.97 (1.18–3.29)</b>	<b>1.97 (1.18–3.29)</b>	<b>2.01 (1.20–3.37)</b>	<b>2.03 (1.21–3.40)</b>	<b>1.79 (1.05–3.04)</b>
> 22 years			1.36 (.82–2.25)	1.34 (.81–2.23)	1.31 (.79–2.19)	1.43 (.85–2.42)
Rural				1.14 (.68–1.90)	1.09 (.64–1.86)	.95 (.55–1.65)
Low educational level of head of household					1.19 (.65–2.18)	1.14 (.61–2.11)
Poor mental health						<b>2.72 (1.52–4.85)</b>

<sup>1</sup>Model 2 adjusted for sex

<sup>2</sup>Model 3 adjusted for sex and age

<sup>3</sup>Model 4 adjusted for sex, age, and area of origin

<sup>4</sup>Model 5 adjusted for sex, age, area of origin educational level of head of household

<sup>5</sup>Model 6 adjusted for sex, age, area of origin educational level of head of household, and mental health

Table 8. Analysis of effect modification between alcohol consumption on the occasion of having sexual intercourse and mental health regarding recent experience of sexual coercion in a sample of Ugandan university students (n = 1954), presented as adjusted Odds Ratios (OR) with 95% Confidence Intervals (CI)

	n (%)	Cases	OR (95 % CI)
Infrequent user of alcohol on the occasion of sexual intercourse and good mental health	176 (37.3)	13	1 (ref)
Infrequent of alcohol on the occasion of sexual intercourse and poor mental health	197 (41.7)	40	<b>3.05 (1.56–5.96)</b>
Frequent user of alcohol on the occasion of sexual intercourse and good mental health	31 (6.6)	5	<b>2.57 (.83–8.00)</b>
Frequent user of alcohol on occasion of sexual intercourse and poor mental health	68 (14.4)	24	<b>8.24 (3.77–18.03)</b>
Missing	118		
			<b>Synergy Index = 2.00</b>

### *Conclusion*

From our findings we conclude that there was an association between alcohol consumption and a recent experience of sexual coercion. Frequent consumption of alcohol on the occasion of sexual intercourse and poor mental health were found to have a synergistic effect on recent experience of sexual coercion in our sample.

### **Study III**

The aim of was to investigate the association between self-reported academic performance and risky sexual behaviours, and determine whether gender affects this relationship among Ugandan university students.

A total of 1,179 (60.3%) students reported having debuted sexually. Of these, 440 (42.2%) used condoms inconsistently with new sexual partners, and 344 (33.6%) had had multiple sexual partners. Table 9 shows an association between self-reported poor academic performance and inconsistent condom use, which was found to be significant in the fully-adjusted model (Model 7, OR adjusted 1.76, 95% CI 1.19–2.62). By contrast, the association between poor academic performance and multiple sexual partners was significant in the unadjusted model (Model 1). However, when adjusted for poor mental health, consuming alcohol on the latest occasion of sexual intercourse, and early sexual debut, the association became insignificant (OR adjusted 1.20, 95% CI .79–1.82) (Table 10).

To further investigate the association we used gender as an effect modifier. The analysis showed that the association between poor academic performance and inconsistent condom use was, modified by gender, resulting in an association that was stronger among females (Table 11). However, gender did not seem to modify the association between poor academic performance and having multiple sexual partners.

Table 9. Association (adjusted odds Ratio, 95% Confidence Interval) between self-reported academic performance and inconsistent condom use with a new partner among Ugandan University students

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Poor academic performance	<b>1.99 (1.37–2.89)</b>	<b>2.07 (1.42–3.01)</b>	<b>1.92 (1.31–2.81)</b>	<b>1.88 (1.28–2.76)</b>	<b>1.86 (1.26–2.75)</b>	<b>1.80 (1.21–2.67)</b>	<b>1.76 (1.19–2.62)</b>
Female		<b>1.60 (1.17–2.17)</b>	<b>1.67 (1.21–2.29)</b>	<b>1.61 (1.16–2.21)</b>	<b>1.60 (1.16–2.12)</b>	<b>1.67 (1.20–2.31)</b>	<b>1.78 (1.27–2.50)</b>
≤23 years			<b>1.42 (1.01–1.98)</b>	<b>1.46 (1.04–2.05)</b>	<b>1.46 (1.04–2.04)</b>	<b>1.50 (1.07–2.11)</b>	<b>1.50 (1.06–2.10)</b>
Rural			<b>1.97 (1.43–2.71)</b>	<b>1.88 (1.36–2.60)</b>	<b>1.88 (1.36–2.59)</b>	<b>1.93 (1.40–2.67)</b>	<b>1.94 (1.40–2.69)</b>
Low social participation				<b>1.58 (1.15–2.16)</b>	<b>1.57 (1.15–2.16)</b>	<b>1.60 (1.14–2.16)</b>	<b>1.56 (1.14–2.15)</b>
Poor mental health					1.04 (.75–1.43)	1.00 (.72–1.39)	.99 (.72–1.37)
Alcohol consumed on the occasion of sexual intercourse						<b>1.67 (1.02–2.72)</b>	1.60 (.97–2.62)
Early sexual debut							1.38 (.95–2.00)

Table 10. Association (adjusted Odds Ratio, 95% Confidence Interval) between self-reported academic performance and multiple sex partners among Ugandan university students

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Poor academic performance	<b>1.56 (1.08–2.27)</b>	<b>1.53 (1.05–2.23)</b>	<b>1.64 (1.11–2.41)</b>	<b>1.61 (1.10–2.37)</b>	<b>1.43 (.96–2.13)</b>	<b>1.31 (.87–1.97)</b>	<b>1.20 (.79–1.82)</b>
Male		<b>2.21 (1.60–3.06)</b>	<b>2.16 (1.55–3.02)</b>	<b>2.24 (1.60–3.14)</b>	<b>2.48 (1.75–3.50)</b>	<b>2.30 (1.62–3.27)</b>	<b>1.89 (1.31–2.72)</b>
≤ 23 years			<b>.63 (.46–.88)</b>	<b>.64 (.46–.90)</b>	<b>.61 (.44–.85)</b>	<b>.63 (.45–.89)</b>	<b>.61 (.43–.87)</b>
Rural			<b>.75 (.54–1.03)</b>	<b>.71 (.52–1.00)</b>	<b>.70 (.48–.93)</b>	<b>.70 (.50–.99)</b>	<b>.71 (.50–1.01)</b>
Low social participation				<b>1.38 (1.00–1.91)</b>	<b>1.36 (.98–1.89)</b>	<b>1.36 (.98–1.91)</b>	<b>1.37 (.97–1.92)</b>
Poor mental health					<b>1.83 (1.31–2.57)</b>	<b>1.68 (1.19–2.37)</b>	<b>1.65 (1.16–2.35)</b>
Alcohol consumed the occasion of sexual intercourse						<b>3.76 (2.26–6.27)</b>	<b>3.40 (2.02–5.72)</b>
Early sexual debut							<b>2.73 (1.86–3.99)</b>



Table 11. Analysis of effect modification between self-reported academic performance and gender in relation to inconsistent condom use with a new sexual partner in a sample of Ugandan university students (n = 1179), presented as adjusted Odds Ratios (OR) with 95% Confidence Intervals (CI)

	n (%)	Cases	OR (95 % CI)
Good self-reported academic performance and Male	540 (46.2)	169 (35.0)	1 (Ref)
Good self-reported academic performance and Female	392 (33.6)	154 (45.2)	<b>1.53 (1.15–2.03)</b>
Poor self-reported academic performance and Male	144 (12.3)	59 (46.1)	<b>1.59 (1.07–2.36)</b>
Poor self-reported academic performance and Female	92 (7.9)	55 (66.3)	<b>3.65 (2.23–5.97)</b>
Missing	(11)		

Synergistic index= 2.37

### *Conclusion*

The results of this study suggest an association between self-reported poor academic performance and inconsistent condom use with a new sex partner, but no association was found with multiple sex partners. Females who were poor academic performers were at a higher risk of inconsistent condom use as compared to their male counterparts.

## Study IV

The aim was to investigate whether gender differences in individual and social factors determine the association between condom efficacy and inconsistent condom use with a new sex partner, among Ugandan university students.

A total of 1,179 (60.3%) students reported having debuted sexually. Of these, 231 (37.4%) males and 209 (49.2%) females reported inconsistent condom use with a new sex partner. Table 12 presents the association between condom efficacy and inconsistent condom use (adjusted for the confounding factors of sex, age, rural origin, friends who always use a condom with a new partner, friends who have difficulty demanding a condom, less pleasure using a condom, multiple sex partners, and alcohol consumption in conjunction with sexual intercourse). In the fully-adjusted model, a statistically significant association persisted between low condom efficacy and inconsistent condom use (OR adjusted 3.94, 95% CI 2.20–7.05).

In Table 13, we tested gender as an effect modifier regarding the association between condom efficacy and inconsistent condom use. The result confirmed the possible synergistic effect of gender, i.e., female gender aggravated the impact of low condom efficacy on inconsistent condom use.

Table 12. Association (adjusted Odds Ratios OR, 95% Confidence Interval CI) between condom efficacy and inconsistent condom use among Ugandan University students

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Low condom efficacy	<b>4.34 (2.51–7.52)</b>	<b>4.03 (3.29–7.08)</b>	<b>4.02 (2.28–7.08)</b>	<b>3.87 (2.19–6.86)</b>	<b>4.00 (2.24–7.11)</b>	<b>3.94 (2.20–7.05)</b>
Female	1.27 (.79–2.04)	1.29 (.79–2.10)	1.29 (.79–2.10)	1.32 (.80–2.15)	1.25 (.76–2.07)	1.33 (.80–2.21)
≤ 23 years		<b>1.66 (1.01–2.73)</b>	<b>1.66 (1.01–2.73)</b>	<b>1.76 (1.07–2.91)</b>	<b>1.75 (1.06–2.90)</b>	<b>1.79 (1.08–2.97)</b>
Rural		<b>2.10 (1.31–3.36)</b>	<b>2.09 (1.30–3.35)</b>	<b>2.15 (1.33–3.45)</b>	<b>2.12 (1.31–3.42)</b>	<b>2.18 (1.34–3.54)</b>
Friends use condom with new partner			1.03 (.63–1.67)	.99 (.60–1.61)	.98 (.60–1.61)	.94 (.57–1.55)
Friends have difficulty demanding condom use with new partner			1.05 (.66–1.69)	1.06 (.66–1.70)	1.08 (.67–1.75)	1.09 (.67–1.76)
Less pleasure with using a condom				<b>1.74 (1.04–2.92)</b>	<b>1.75 (1.04–2.93)</b>	<b>1.78 (1.06–3.00)</b>
Multiple sexual partners					.79 (.49–1.28)	.69 (.41–1.13)
Alcohol in relation to sex <sup>1</sup>						<b>2.13 (1.19–3.82)</b>

<sup>1</sup>Analysed only for those who had consumed alcohol

Table 13. Analysis of effect modification between condom efficacy and gender regarding inconsistent condom use among Ugandan university students (n = 1179), presented as adjusted Odds Ratios (OR) with 95% Confidence Intervals (CI)

	n (%)	Cases	OR (95 % CI)
High condom efficacy / Male	485 (47.9)	125 (27.7)	1 (ref)
High condom efficacy / Female	279 (27.5)	279 (27.5)	1.17 (.84–1.63)
Low condom efficacy / Male	138 (13.6)	138 (13.6)	<b>4.66 (3.08–7.07)</b>
Low condom efficacy / Female	111 (11.0)	111 (11.0)	<b>7.55 (4.62–12.33)</b>
Missing	166		

Synergy Index = 1.71

### Conclusion

Study IV showed an association between low condom efficacy and inconsistent condom use with a new sex partner. Females with low condom efficacy were found to be at a higher risk of inconsistent condom use in comparison to males.

# Discussion

The results of this thesis indicated various factors that can determine risky sexual behaviours. Inequitable gender power relations play a crucial role in this area, even among an educated Ugandan university population.

Our findings showed an association between socio-demographic factors, relationship status, alcohol consumption, academic performance, condom efficacy, and risky sexual behaviours, including sexual coercion, among those in our sample. However, there were considerable gender differences observed and some of the factors modified the effect of these associations. The socio-ecological model we used as a conceptual framework pointed to a number of individual, relationship, community, and societal factors that affect young people's sexual behaviours. On an individual level, a person's age, sex, mental health, condom efficacy, academic performance, alcohol consumption patterns, intention to use a condom, early sexual debut, and taking less pleasure in using a condom played a vital role in their behaviour. Proximal relationships with peers and sexual partners have a crucial influence on young people, and may affect their sexual decisions. As young university students, they might not have a good risk assessment of certain situations. On a community level, area of origin and social capital can contribute to their experiences, and may affect their behaviours. Societal factors such as religion, socio-economic status, and gender norms play a vital role in behaviours. Combined with existing gender inequalities these can also affect the sexual behaviours of young people. Gender norms are a societal construct but their impact cuts across all levels of society.

Gender norms have been explained by Connell's theory of gender and power. It describes social structures such as the sexual division of labor, sexual division of power and the structure of cathexis (social norms and affective attachments by which men and women relate to each other in a society) as based on sexual inequality and a gender power imbalance between males and females [29]. Connell describes these structures on the institutional and societal level. An institutional level has discrepancies such as stereotypical or degrading pictures of women in the media, access to health care, and men controlling the family income [30]. The presence of these disparities, together with other social mechanisms, creates gender inequalities.

On a societal level social norms are maintained through mechanisms which limit men and women in the expression of their sexuality [30]. Social norms enforce strict gender roles and stereotypical beliefs that a women's sexuality is for procreation only. They restrain a woman for example, from having multiple sexual partners, which is an accepted norm for men. Women who must live under such norms such as having

older partners, living in a family environment that is not supportive of HIV prevention, mistrusting the medical system, and forbidden access to contraception, are at increased risk of poor reproductive health outcomes [30].

Since Uganda has a young population, one must understand the effect these issues of gender and sexuality have on behaviour. Due to rapid globalization and mass media awareness, young people today have different exposures. University students in particular are suddenly exposed to a liberal environment and are away from parental control. Also, as they are in a phase where they are more prone to taking risks and exploring their sexuality, it may put them at risk of unwanted pregnancies and sexually transmitted diseases (STIs). Therefore, it is crucial that their concerns are addressed through appropriate channels.

University students have internalised gender norms, as is evident from a study conducted among Ugandan university students that revealed 32.5% of the males and 30% of the females thought force is justified for obtaining sex in a relationship [44]. Moreover, 37% of the males thought that force is justified when you have spent money on your partner, and 28.8% of females were of a similar opinion. Gender power relations seem to play an integral role in a Ugandan society, and this may lead to poorer reproductive health outcomes for women.

There is a need to provide university students with sex education that addresses gender and sexuality. This may be a way forward towards having equal gender relations between males and females. We sought to determine the potential risk factors associated with certain sexual behaviours in this population, and especially the role gender plays in shaping its sexual behaviours.

In Study I, we found that the determinants for non-use of contraception differed between men and women. Students who were not in a relationship had a higher risk of not using contraception. Students, who were not in a steady relationship, were engaging in unplanned sexual activity. The non-use of contraceptive at that time could be due to lack of communication between partners or the non-availability of contraception. There is evidence from previous research that higher levels of intimacy and partner communication increases the probability of condom and contraceptive use [94].

Our findings for 'type of partner' and 'length of relationship' did not show any association with non-use of contraception. This was in contrast to previous literature which showed that individuals in steady relationships have a higher prevalence of contraceptive use due to better communication between partners [95-97].

In our study, females were found to be at higher risk for non-use of contraception when not in a relationship, as compared to males. A possible explanation might be that the socio-cultural factors and gender norms in Uganda, where men are the decisions makers (even regarding contraceptive use) which places women in a vulnerable position for negotiating safe sex [11]. We did not have information regarding the age of partners, but there is evidence from previous research in Uganda that there is a prevalence of transactional and cross-generational sex (i.e a considerably older man with whom women are in a sexual relationship for money or material goods, also known as ‘sugar daddies’) [90, 98]. These relationships create inequalities and power imbalances that may lead to sexual coercion and non-use of contraception. Such issues should be addressed when planning interventions.

The high rate of fertility rate (6.2) and teenage pregnancies (24%) [99] suggests that many sexually active young people in Uganda are not prepared to protect themselves from pregnancy. They may be unaware of how or where to obtain contraceptives. They may also lack knowledge about STIs due to barriers in accessing health care services [100]. This is supported by the results of Study I, where early sexual debut was found to have an independent association with non-use of contraception. Previous research in China and Uganda on young people shows that those who experience sex early in life are less likely to use contraception compared to those who begin at a later stage [101, 102]. Sex education at an early stage may be of prime importance, in Uganda, considering that nearly 12% of the males and 13% of the females there have sexually debuted by 15 years of age [99]. Early sex education might help combat unwanted pregnancies, STIs, and unsafe abortions later in life.

Alcohol consumption was found to be a risk factor for unsafe sexual behaviours in Studies I, III and IV (including sexual coercion as found in Study II). In a university environment where students socialize at bars and parties, excessive alcohol consumption may lead to risky sex or sexual coercion. As previous research on sexual coercion, has shown, it might be difficult to disentangle the direct effect of the alcohol consumed by the victim, from the effect of the setting or environment, in which perpetrators were also present [103].

Our specific findings regarding alcohol in relation to sex and its association with recent experience of sexual coercion could be due to various mechanisms. On a psychological and behavioural level, alcohol may decrease the risk perception and the ability to communicate assertively, making an individual more vulnerable to sexual coercion [50, 103, 104]. There are various theories about alcohol and risky sex, such as alcohol disinhibition [105] and alcohol myopia theory [56] suggesting a person might not be able to identify the potential dangers, including the risk of being sexually coerced.

We found some gender differences regarding this association, females who consumed alcohol were found to be at a higher risk of being sexually coerced compared to their male counterparts. The reason for this may be the gender norms prevalent in Uganda, where consuming alcohol by males is considered masculine, while alcohol consumption among females is perceived as a signal that they are available for sex [106]. These stereotypes become exacerbated by the gender inequalities in Ugandan society.

Little is known about self-reported poor academic performance as being a factor for risky sexual behaviours. Academic performance put a great deal of psychological pressure on young university students. Perhaps risky sexual behaviours are affected by poor academic performance. We did find an association between poor academic performance and inconsistent condom use in agreement with previous study conducted among undergraduate students in China among undergraduate students that found poor academic performance to be a risk factor for inconsistent condom use and having multiple sex partners [107].

Our association of poor academic performance with inconsistent condom use corroborates prior studies, although they were conducted in high income countries. In the (US) on adolescents with a high GPA score were prone to risky sexual behaviours, early pregnancies and substance abuse [108-110]. We feel these findings are even more appropriate in a university population, as students undergo considerable stress and may not be able to apply cognitive skills such as risk assessment to sexual behaviours, one result of which might be inconsistent condom use.

We did not find an association between poor academic performance and having multiple sexual partners. A possible explanation could be that poor mental health and alcohol consumption were acting as mediating factors. It may be that, due poor academic performance, students become depressed or visa-versa, and to compensate for their low self-esteem they might engage in risky sexual practices, alcohol, and substance abuse. There is prior research conducted in Uganda and South Africa which shows that these factors have a strong association with multiple sexual partners [111, 112].

Regarding the effect of gender, our findings were different for men and women, particularly for inconsistent condom use. Poor academic performance was found to be a higher risk factor for women than men. A possible reason for this could be that women lack self-esteem and feel that their value as a future partner or spouse has been lowered. As a result they are unable to negotiate condom use compared to females who are doing well academically, which strengthens their self-confidence and makes them feel more empowered to negotiate safe sex.



Condom efficacy is also another crucial factor that is known to increase in condom use among young people. Based on our findings there was an association between low condom efficacy and inconsistent condom use. The effect was considerably higher among women than men. There is evidence from previous research conducted in Tanzania, that shows that gender differences regarding predictors of condom use in relation to condom efficacy [113]. This could be due to the gender power relations in this region, as similar findings were found in previous studies conducted in South Africa, Botswana, and Angola [114, 115]. An explanation for this could be that condom use is equated with lack of trust by men, leading to fear of rejection by some women, who feel intimidated. The result may be non-use on condoms.

Among other individual factors 'less pleasure when using a condom' was associated with non-use of condoms, agreeing with evidence from a meta-analysis study where the prevalence of non-use was higher among males than females [116]. Contrary to previous research our findings regarding 'intention to use a condom' did not show any association with inconsistent condom use. This can be explained by the theory of planned behaviour, which shows that behavioural intentions are determined by attitudes, subjective norms, and perceived behavioural control. These may lead to substantial variation in actual behaviour, in different situations [74, 75]. Therefore, just having the intention to use a condom might not translate to behaviour in Uganda, where the traditional socio-cultural norms of non-condom use are so pervasive. Amid the feminization of the HIV epidemic in this region it is important to focus on improving condom efficacy to improve reproductive health indicators.

### **Strengths and limitations**

One of the limitations of our study was that only 10% of all Ugandan young people attend tertiary education. Therefore, our findings might not be generalizable to the national population of Uganda. However, we do feel that our results may reflect the situation of other Ugandan university students. According to our calculations the statistical power of the studies was adequate for the main analysis, but was somewhat small for the effect modification analysis. As a result, no test of statistical significance was done on that analysis. We feel that we may have lost some information due to dicotomization of the variables. To reduce the response bias in our study, anonymity of the respondents was maintained, which may have increased truthful reporting and in turn, might have given more accurate results. Another potential limitation was that our questionnaire did not have information on the drinking patterns of sex partners or for the perpetrators of sexual coercion. We also lacked data to access the types of contraceptive methods used at first sexual intercourse or lifetime use, which could

have given us a better representation of the consistency of contraceptive prevalence in our sample.

One of the strengths of our study was examining the drinking patterns of the victims of sexual coercion and the effect these had on sexual coercion, whereas most previous research has investigated the opposite causal direction. We speculate that sexual coercion might be higher among non-responders, who may underreport in a survey, because of stigma attached to sexual coercion that may make them apprehensive in disclosing such details. Another limitation of our study was our assessment of condom efficacy. Since it was limited to two questions, it is possible that more information could have resulted in greater disclosure on the efficacy of the participants.

## **Methodological considerations**

### *Study design*

Our studies adopted a cross-sectional design, due to which we were unable to judge the causal direction for some of the associations analyzed in our studies. In studies I-IV it is more plausible that relationship status, alcohol consumption, poor academic performance, and condom efficacy might have led to risky sexual behaviour than vis-a-versa, since one needs to have a partner either to use or not use a contraceptive (Study I). In Study III, alcohol consumption might have led to sexual coercion. This can be supported by the mechanisms as discussed above on alcohol myopia [56] and alcohol disinhibition theory [55]. In Study IV, condom efficacy may have been necessary to determine the use or non-use of a condom.

### *Selection and recall bias*

Our survey was directed towards all students at MUST. The response rate of 72% may leave some room for a selection bias. However, the reasons for non-participation do not appear to be linked to the exposure or the outcome, but were mainly due to logistical circumstances and could therefore be considered random. The internal missing data was represented as it was either stated in the dataset or could be random, possibly leading to some selection bias in an unknown direction. However, the probability of that drastically affecting our results is unlikely. The information for some of the sexual behaviour variables in our studies was retrospective, which may have led to a recall bias. Some of our findings may, therefore, have been underestimated due to the issue of social desirability.

### *Misclassification*

Misclassification is one of the most common measurement errors in epidemiological research. It occurs when the exposure or the disease is wrongly classified, i.e, when an exposed individual is classified as unexposed or visa-versa [117]. Non-differential misclassification refers to errors in the classification of the exposure that are unrelated to the outcome or visa-versa. As a result, misclassification influences the effect towards the null, which leads to an underestimation of the effect. On the other hand, differential misclassification of the exposure occurs if the classification of exposure is influenced by outcome status (i.e as a case or a non-case). The outcome in all our studies was risky sexual behaviours. As these are sensitive issues, we feel the prevalence of these behaviours might have been underreported due to the social desirability. Therefore, if this were the case of non-differential misclassification, it would have biased our findings towards the null.

### *Confounding*

Confounding occurs when the effect of an exposure is mixed with the effect of another variable, possibly leading to underestimation or overestimation of the effect measured [118]. A variable is considered a confounder only under three conditions: it should have a) an association with the exposure, b) a causal association with the outcome, and c) not be a part of the causal pathway [119]. We adjusted for the confounding factors by adopting a step-wise multivariate analysis. As we adjusted for most of the obvious confounding factors, we feel that residual confounding would be of minor importance.

# Conclusions and recommendations

Our studies reinforce the international awareness that the key issues affecting young peoples' sexual and reproductive health outcomes are largely similar, but the mechanisms for addressing them need to be country specific.

The key factors that contribute towards risky sexual behaviours among Ugandan university students were socio-demographic factors, relationship status, alcohol consumption, academic performance, and condom efficacy. Unequal gender power relations between males and females played a crucial role in sexual relations, due to which women lacked the power to negotiate condom or contraceptive use. Therefore, they are at a higher risk for poor reproductive health outcomes such as STIs and unwanted pregnancies. Males, who are currently not the focus of programs in low- or middle-income countries, were also found to be at risk for unsafe sexual behaviours.

We need to create a policy action environment (not merely policies) in which sexual and reproductive health rights is addressed by raising awareness among males and females. In universities this could be achieved through skill building programs such as sex education, peer counseling, and partner communication, with a special focus on women by teaching them skills for negotiating condom and contraceptive use. These programs need to address the socio-cultural and gender perspectives in addition to focusing on safe sex and sexual rights. Improving access to health care services, fostering gender equality, encouraging safer sexual initiation will have a positive impact on the reduction of HIV transmission and unwanted pregnancies. Such empowering programs will help us achieve MDG 3 (Promote gender equity and empower women), MDG 5 (Improve maternal health), MDG 5b (Universal access to reproductive health), and MDG 6 (Combat HIV, malaria, and other diseases) on the country level.

# Summary in Swedish

Det finns idag 1,8 miljarder ungdomar i världen och de utgör ungefär 25 % av jordens befolkning. De flesta av dem bor i låg- och mellaninkomstländer. Trots de åtaganden som världssamfundet tagit på sig i samband med FN:s befolkningskonferens 1994 och arbetet med att uppfylla milleniemålen, har dessa ungdomars behov av sexuell och reproduktiv hälsa inte tillgodosetts, vilket innebär allvarliga konsekvenser för ungdomars sexuella och reproduktiva hälsa.

Uganda är ett land med en ung befolkning – nära 50 % är under 15 år. I och med införandet av en allmän skolplikt studerar nu alltfler ugandier på universitetsnivå. Socio-kulturella normer i Uganda underbygger ojämlikheter mellan könen. Det finns ett tydligt samband mellan kvinnors underordning och sexuellt risktagande, där kvinnor inte kan driva igenom säkrare sex och utsätts således för oönskade graviditeter och sexuellt överförbara sjukdomar.

Olika faktorer påverkar sexuellt risktagande i en universitetsmiljö. Det är även i detta sammanhang mycket viktigt att förstå sambanden mellan könsroller och sexualitet för att minska feminiseringen av HIV-epidemin i Afrika söder om Sahara. Det övergripande syftet med denna avhandling är att med utgångspunkt från ett genusperspektiv få djupare kunskap om de faktorer som påverkar sexuellt risktagande bland ugandiska studenter och öka kunskapsbasen för ett fortsatt framgångsrikt och förebyggande arbete avseende sexuellt överförbara sjukdomar inkluderande HIV/AIDS och oönskade graviditeter och därigenom bidra till effektivare policyformulering och implementering inom området. Denna kunskap är för närvarande begränsad då det gäller de specifika detaljerna i orsaksmekanismerna, vilket utgör en begränsning för möjligheterna att förebygga sexuell ohälsa i Uganda och liknande länder

Avhandlingen består av fyra delarbeten. I det första delarbetet med titeln *Non-use of contraception: determinants among Ugandan university students* studeras hur olika bestämningfaktorer i miljön och hos individerna påverkar valet att inte använda preventivmedel, i den undersökta studentpopulationen. Ett viktigt fynd var att relationsstatus var en oberoende bestämningfaktor; att inte vara i en fast relation ökade risken för att inte använda preventivmedel, såväl för män som för kvinnor. Sociodemografiska bestämningfaktorer för preventivmedelsanvändning skilde sig mellan män och kvinnor. Studiens resultat diskuteras i termer av stigma och kommunikativa färdigheter i sexuella kontaktsituationer. Detta delarbete är publicerat i tidskriften *Global Health Action*, 2012.

I det andra delarbetet *Does drinking alcohol expose Ugandan university students to sexual coercion? A cross sectional study* utvidgas analysen avseende avhandlingens övergripande frågeställning till att specifikt analysera sambanden mellan alkoholvanor och erfarenheter av att ha varit utsatt för sexuellt tvång, vilket är vanlig bland unga personer i Uganda, särskilt kvinnor. Ett samband kunde konstateras mellan alkoholkonsumtion och nyligen upplevt sexuellt tvång, vilket potentierades i närvaro av symptom på psykisk ohälsa. Även dessa fynd sätts in i ett genusperspektiv och möjligheten att förebygga sexuellt tvång och hög alkoholkonsumtion i universitetsmiljön diskuteras.

I det tredje delarbetet med titeln *Association between self-reported academic performance and risky sexual behavior among Ugandan university students - a cross sectional study* analyseras hur en viktig stressfaktor i universitetsmiljön, bristande framgång i studierna, påverkar sexuellt risktagande och hur detta samspelar med andra bestämningsfaktorer för sådant beteende. Ett statistiskt signifikant samband mellan bristande framgång i studierna och låg kondomanvändning kunde konstateras för hela studerandegruppen. Detta samband var emellertid mer framträdande bland kvinnorna än bland männen, och olika genusrelaterade förklaringsmodeller till detta diskuteras.

I det fjärde delarbetet med titeln *Inconsistent condom use with a new sexual partner among Ugandan university students in a gender perspective- a cross sectional study* fördjupas analysen av bestämningsfaktorer för kondomanvändning i den studerade gruppen. Syftet med studien var att ur ett genusperspektiv undersöka hur individuella och sociala faktorer påverkar sambandet mellan så kallad "condom efficacy" (den egna bedömningen hur väl man anser sig kunna föreslå och använda kondom i samlagssituationen) och inkonsekvent användning av kondomer. Den beteendefaktor som framstod tydligast för både män och kvinnor, var just "condom efficacy". Även detta samband var tydligare för kvinnorna i undersökningen, jämfört med männen. Detta diskuteras i förhållande till hur traditionella genusrelationer påverkar effekten av "condom efficacy".

Slutsatsen från studierna är att de viktigaste faktorerna som bidrog till sexuella riskbeteenden bland ugandiska universitetsstudenter var sociodemografiska faktorer, civilstånd, alkoholkonsumtion, studieresultat samt kondomanvändning. Ojämliga maktrelationer mellan könen i regionen utgjorde också en bidragande faktor till sexuella riskbeteenden. Det är således viktigt att skapa en policymiljö (inte bara politisk) i vilken sexuell och reproduktiv hälsa och rättigheter adresseras genom att öka medvetenheten bland män och kvinnor. Bland universiteten kan detta uppnås

genom kapacitetsutvecklande program såsom sexualundervisning, kamratrådgivning och partnerkommunikation- med särskilt fokus på att stärka unga kvinnors inflytande i förhandlingssituationen kring användandet av kondom och andra preventivmedel. Förutom att fokusera på säker sex och sexuella rättigheter måste sådana program även ta itu medrådande genusnormativa och sociokulturella aspekter.

# Acknowledgements

I would like to extend my warmest gratitude to all those people who have guided and supported me in the completion of my thesis work, and in particular to following:

Per-Olof Östergren, my supervisor, for your impeccable scientific knowledge and sharp constructive criticism which pushed me to think and perform better. This has been a great foundation of learning that has made me aspire to higher goals and will go a long way in my professional career. I also enjoyed our stimulating discussions and the hilarious stories from your past experiences.

Anette Agardh, my co-supervisor, for your guidance, critical comments and insightful questions that challenged me to improve my work and for your help during crisis. I appreciate your permission for letting me have access to your Ugandan dataset. A special heartfelt thank you for being there, even for personal matters when my parents were not around.

Karen Odberg Pettersson, co-author, for immense support, dedication, wise comments, and encouragement during my journey.

Martin Stafström, co-author, for your sharpness and contributions that always added a new dimension to my thought process.

Bjorn Ekman, co-author, for your valuable insights and generous contributions to my work.

Emmanuel Kyagaba, co-author, for sharing your knowledge and a much needed Ugandan perspective to this thesis.

Maria Emmelin, for your warmth, support and encouragement. I appreciate the courage you possess to express your opinions and for all the positive energy you bring to the work environment. Also, special thanks for introducing me to the Swedish Research School for Global Health and for agreeing to be the chair at my PhD defense.

Anders Emmelin, for being a wonderful colleague and for accepting to be the opponent for my pre-PhD defense.



Elizabeth Cantor-Grace, for sharing your knowledge and experience answering my questions in the middle of your work, and for your interest and love for my native country.

Charlotte A Larsson, for being a helpful colleague and for teaching me epidemiology.

Mahnaz Moghaddassi, for your kindness and all the statistical support you have provided over the years.

Kontie Moussa, for always being so cheerful and telling me to ‘work hard for that one day when you graduate and all this hard work seem worth it’. Every time I felt low, I thought of this and took a step further.

Vikas Choudhry, for being such an integral part of my professional life. This thesis would not have been what it is if it were not for the endless discussions we have had in the past few years. Heartfelt thanks for being like my family in Sweden. You truly filled the void of all the relations I missed back at home.

Benedict Oppong Asamoah, for being friendly, modest, humble and for the immense support you provided whenever it was needed. Your dedication and work ethic is admirable.

Mats Sundbeck, for your friendship and for all the humor you brought to our PhD room.

Markus Larsson, for always being so caring and supportive, professionally and personally. I enjoyed all the fun times we had together.

Faisal Hazza Al-Emrani, for your support and always being around when we were sharing similar situations from the start of this journey to the finish line.

Susanne Sundell-Lecerof, a great friend and colleague. I truly admire your strength for handling tough situations and also for being a great support

Georgios Gavriilidis for your friendly and helpful presence during my journey.

Jenny Arfwedson, for your warmth and concern, especially times of crisis, as when I fractured my hand.

Cecilia Fernbrant, for being so warm, supportive, a patient listener and whose sensitive eye could see when I was feeling low.

Becky Nelson, for contributing towards my work and for always being there when I needed a friend. Thank you so much for helping me make new friends in Sweden.

Ditte Mårtensson, for all the support, warmth, and love that is beyond words, and for always going that extra mile in helping out in every little thing professionally and personally.

Maria Scherling, for being so lovely and sweet to me throughout my journey.

Sanna Melin Schyllert, for being such a warm and loving friend. I truly admire the clarity of your vision towards life and the perfectionism you try to bring in everything you do.

Linda Palmqvist, for always being so warm, fun, and present whenever I needed a friend. You made up for all the girlfriends I left at home.

Elena Lirakis, for being so helpful and kind, for being the first friend I made in Sweden, and for introducing me to salsa.

Teddy Primark, for working so efficiently in proof reading my thesis. It has been a great learning experience which will go a long way in my academic writing.

A special thanks to the research team and all the students at MUST who participated in the survey, without which these studies would not have been possible.

Sunil Mehra and Beenu Mehra, my parents, for whom words will never suffice to thank you for your boundless love, warmth, encouragement and believing in me when I myself did not. I hold all the values you have given very me close to my heart. I cherish you as the best parents in the world.

Ruchika Jain, my sister, for all the love and concern you show, in the sweet gestures and the little things you do for me. I have truly missed you around in these years.

Kushal Jain, my brother-in-law, for your love, support and guidance whenever it was needed.

# References

1. UN Department of Economic and Social Affairs, Population Division: *World Population Prospects: The 2010 Revision*. New York; 2012.
2. Sawyer SM, Afifi RA, Bearinger LH, Blakemore SJ, Dick B, Ezech AC, Patton GC: Adolescence: a foundation for future health. *Lancet* 2012, 379(9826):1630–1640.
3. Marmot M, Friel S, Bell R, Houweling TA, Taylor S: Closing the gap in a generation: health equity through action on the social determinants of health. *Lancet* 2008, 372(9650):1661–1669.
4. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A, Currie C: Adolescence and the social determinants of health. *Lancet* 2012, 379(9826):1641–1652.
5. CSDH: Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health. Final Report of the Commission on Social Determinants of Health. Geneva: WHO; 2008.
6. Jejeebhoy SJ, Zavier AJ, Santhya KG: Meeting the commitments of the ICPD Programme of Action to young people. *Reprod Health Matters* 2013, 21(41):18–30.
7. Blum RW, Bastos FI, Kabiru CW, Le LC: Adolescent health in the 21st century. *Lancet* 2012, 379(9826):1567–1568.
8. Shah IH, Leal OF, Bronfman M: Sexual and reproductive health of young people. In: *Scielo Public Health*. vol. 50. Mexico; 2008: 8–9.
9. Patton GC, Coffey C, Sawyer SM, Viner RM, Haller DM, Bose K, Vos T, Ferguson J, Mathers CD: Global patterns of mortality in young people: a systematic analysis of population health data. *Lancet* 2009, 374(9693):881–892.
10. Senderowitz J (ed): *The Growing Biosocial Gap – A Challenge for Addressing Adolescent Fertility*. Washington, DC: Center for Populations Options; 1992.
11. Nalwadda G, Mirembe F, Byamugisha J, Fixelid E: Persistent high fertility in Uganda: young people recount obstacles and enabling factors to use of contraceptives. *BMC Public Health* 2010, 10:530.
12. Adhikari R, Tamang J: Premarital sexual behavior among male college students of Kathmandu, Nepal. *BMC Public Health* 2009, 9:241.
13. Aggarwal O, Sharma AK, Chhabra P: Study in sexuality of medical college students in India. *J Adolesc Health* 2000, 26(3):226–229.
14. Ma Q, Ono-Kihara M, Cong L, Xu G, Pan X, Zamani S, Ravari SM, Zhang D, Homma T, Kihara M: Early initiation of sexual activity: a risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China. *BMC Public Health* 2009, 9:111.
15. Were M: Determinants of teenage pregnancies: the case of Busia District in Kenya. *Econ Hum Biol* 2007, 5(2):322–339.
16. UN: World Youth Report 2007: Young People’s Transition to Adulthood – Progress and Challenges. New York; 2007

17. Eaton L, Flisher AJ, Aarø LE: Unsafe sexual behaviour in South African youth. *Soc Sci Med* 2003, 56(1):149–165.
18. Prata N, Vahidnia F, Fraser A: Gender and relationship differences in condom use among 15–24-year-olds in Angola. *Int Fam Plan Perspect* 2005, 31(4):192–199.
19. Agardh A, Cantor-Graae E, Ostergren PO: Youth, sexual risk-taking behavior, and mental health: a study of university students in Uganda. *Int J Behav Med* 2012, 19(2):208–216.
20. UNFPA: Annual Report 2011. Delivering Results in a World of 7 Billion. New York; 2011.
21. UNAIDS, WHO: *2009 AIDS Epidemic Update*. Geneva; 2009.
22. Harman S: The dual feminisation of HIV/AIDS. *Globalizations* 2011, 8(2):213–228.
23. Barker G, Ricardo C: Young men and the construction of masculinity in Sub-Saharan Africa: implications of HIV/AIDS, conflict and violence. Paper No. 26. In: *Social Development Papers: Conflict Prevention & Reconstruction*. Washington, DC: World Bank; 2005.
24. Kaye DK: Gender inequality and domestic violence: implications for human immunodeficiency virus (HIV) prevention. *Afr Health Sci* 2004, 4(1):67–70.
25. Dowsett GW: Some considerations on sexuality and gender in the context of AIDS. *Reprod Health Matters* 2003, 11(22):21–29.
26. UN: The Millenium Development Goals Report 2013. New York; 2013.
27. van der Kwaak A, Wegelin-Schuringa M: *Gender and Health: Policy and Practice: A Global Sourcebook*. Amsterdam: KIT Publishers; 2006.
28. Doyal L: Sex, gender, and health: the need for a new approach. *BMJ* 2001, 323(7320):1061–1063.
29. Connell RW: *Gender and Power: Society, the Person and Sexual Politics*. Palo Alto, CA: Stanford University Press; 1987.
30. Wingood GM, Scd, DiClemente RJ: Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Educ Behav* 2000, 27(5):539–565.
31. Shearer CL, Hosterman SJ, Gillen MM, Lefkowitz ES: Are traditional gender role attitudes associated with risky sexual behavior and condom-related beliefs? *Sex Roles* 2005, 52(5-6):311–324.
32. UNFPA: State of World Population 2010. From Conflict and Crisis to Renewal: Generations of Change. New York; 2010.
33. Uganda Bureau of Statistics (UBOS): *2012 Statistical Abstract*. Kampala; 2012.
34. Population Reference Bureau: *2009 World Population Data Sheet*. Washington, DC; 2009.
35. Uganda National Council for Higher Education: The State of Higher Education and Training in Uganda 2010: A Report on Higher Education Delivery and Institutions. Kampala; 2010.
36. Uganda Ministry of Health and ICF International: *Uganda AIDS Indicator Survey: Key Findings*. Calvert, MD; 2012.

37. Uganda Ministry of Gender, Labour and Social Development: *The National Youth Policy*. Kampala: Uganda Ministry of Health; 2001.
38. Uganda Ministry of Health, Reproductive Health Division: *National Adolescent Health Policy for Uganda*. Kampala; 2004.
39. Uganda Ministry of Gender Labour and Social Development: *The Uganda Gender Policy*. Kampala: Uganda Ministry of Health; 2007.
40. Uganda Ministry of Health: *Health Sector Strategic Plan III 2010/11-2014/15*. , Kampala; 2010.
41. Nalwadda G, Mirembe F, Tumwesigye NM, Byamugisha J, Faxelid E: Constraints and prospects for contraceptive service provision to young people in Uganda: providers' perspectives. *BMC Health Serv Res* 2011, 11:220.
42. Voeten HA, Egesah OB, Habbema JD: Sexual behavior is more risky in rural than in urban areas among young women in Nyanza province, Kenya. *Sex Transm Dis* 2004, 31(8):481–487.
43. Agardh A, Tumwine G, Östergren PO: The impact of socio-demographic and religious factors upon sexual behavior among Ugandan university students. *PLoS One* 2011, 6(8):e23670.
44. EAC/AMREF Lake Victorial Partnership (EALP) Programme: HIV Sero-Behavioural study in Six Universities in Uganda. SIDA; 2010.
45. Biddlecom AE, Hessburg L, Singh S, Bankole A, Darabi L: Protecting the Next Generation in sub-Saharan Africa: Learning from Adolescents to Prevent HIV and Unintended Pregnancy. New York: Guttmacher Institute; 2007.
46. Glynn JR, Caraël M, Auvert B, Kahindo M, Chege J, Musonda R, Kaona F, Buvé A: Why do young women have a much higher prevalence of HIV than young men? A study in Kisumu, Kenya and Ndola, Zambia. *AIDS* 2001, 15 Suppl 4:S51–60.
47. Underwood C, Skinner J, Osman N, Schwandt H: Structural determinants of adolescent girls' vulnerability to HIV: views from community members in Botswana, Malawi, and Mozambique. *Soc Sci Med* 2011, 73(2):343–350.
48. Stafström M, Agardh A: Socio-economic determinants for alcohol consumption and heavy episodic drinking in a Ugandan student population. *Int J Alcohol Drug Res* 2012, 1(1):57–67.
49. Benson BJ, Gohm CL, Gross AM: College women and sexual assault: the role of sex-related alcohol expectancies. *J Fam Viol* 2007, 22(6):341–351.
50. Abbey A: Alcohol-related sexual assault: a common problem among college students. *J Stud Alcohol Suppl* 2002, (14):118–128.
51. Krebs CP, Lindquist CH, Warner TD, Fisher BS, Martin SL: College women's experiences with physically forced, alcohol- or other drug-enabled, and drug-facilitated sexual assault before and since entering college. *J Am Coll Health* 2009, 57(6):639–647.
52. Agardh A, Odberg-Pettersson K, Östergren PO: Experience of sexual coercion and risky sexual behavior among Ugandan university students. *BMC Public Health* 2011, 11:527.

53. Uganda Youth Development Link (UYDEL): State of Alcohol Abuse in Uganda: "Young People Drinking Deeper into Poverty". Kampala; 2008.
54. Zablotska IB, Gray RH, Koenig MA, Serwadda D, Nalugoda F, Kigozi G, Sewankambo N, Lutalo T, Wabwire Mangen F, Wawer M: Alcohol use, intimate partner violence, sexual coercion and HIV among women aged 15–24 in Rakai, Uganda. *AIDS Behav* 2009, 13(2):225–233.
55. Critchlow B: The powers of John Barleycorn. Beliefs about the effects of alcohol on social behavior. *Am Psychol* 1986, 41(7):751–764.
56. Steele CM, Josephs RA: Alcohol myopia. Its prized and dangerous effects. *Am Psychol* 1990, 45(8):921–933.
57. Andrews JA, Duncan SC: Examining the reciprocal relation between academic motivation and substance use: effects of family relationships, self-esteem, and general deviance. *J Behav Med* 1997, 20(6):523–549.
58. Bergen HA, Martin G, Roeger L, Allison S: Perceived academic performance and alcohol, tobacco and marijuana use: longitudinal relationships in young community adolescents. *Addict Behav* 2005, 30(8):1563–1573.
59. Cox RG, Zhang L, Johnson WD, Bender DR: Academic performance and substance use: findings from a state survey of public high school students. *J Sch Health* 2007, 77(3):109–115.
60. Hardy JB, Astone NM, Brooks-Gunn J, Shapiro S, Miller TL: Like mother, like child: intergenerational patterns of age at first birth and associations with childhood and adolescent characteristics and adult outcomes in the second generation. *Dev Psychol* 1998, 34(6):1220–1232.
61. Luster T, Small SA: Factors associated with sexual risk-taking behaviors among adolescents. *J Marriage Fam* 1994, 56(3):622–632.
62. Sayles JN, Pettifor A, Wong MD, MacPhail C, Lee SJ, Hendriksen E, Rees HV, Coates T: Factors associated with self-efficacy for condom use and sexual negotiation among South african youth. *J Acquir Immune Defic Syndr* 2006, 43(2):226–233.
63. Peltzer K: Factors affecting condom use among senior secondary school pupils in South Africa. *Cent Afr J Med* 2000, 46(11):302–308.
64. Bandura A: Health promotion by social cognitive means. *Health Educ Behav* 2004, 31(2):143–164.
65. Bandura A: Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, NJ: Prentice Hall; 1986.
66. Black DS, Sun P, Rohrbach LA, Sussman S: Decision-making style and gender moderation of the self-efficacy-condom use link among adolescents and young adults: informing targeted STI/HIV prevention programs. *Arch Pediatr Adolesc Med* 2011, 165(4):320–325.
67. Bandura A: Social cognitive theory and exercise of control over HIV infection In: DiClemente RJ, Peterson JL (eds), *Preventing AIDS: Theories and Methods of Behavioral Interventions*. New York: Plenum Press; 1994: 25–59.
68. Baele J, Dusseldorp E, Maes S: Condom use self-efficacy: effect on intended and actual condom use in adolescents. *J Adolesc Health* 2001, 28(5):421–431.

69. Walusaga HA, Kyohangirwe R, Wagner GJ: Gender differences in determinants of condom use among HIV clients in Uganda. *AIDS Patient Care STDS* 2012, 26(11):694–699.
70. Dilorio C, Dudley WN, Soet J, Watkins J, Maibach E: A social cognitive-based model for condom use among college students. *Nurs Res* 2000, 49(4):208–214.
71. Lindberg CE: Knowledge, self-efficacy, coping, and condom use among urban women. *J Assoc Nurses AIDS Care* 2000, 11(5):80–90.
72. Schaalma H, Aarø LE, Flisher AJ, Mathews C, Kaaya S, Onya H, Ragnarson A, Klepp KI: Correlates of intention to use condoms among Sub-Saharan African youth: the applicability of the theory of planned behaviour. *Scand J Public Health* 2009, 37 Suppl 2:87–91.
73. Mashegoane S, Moalusi KP, Peltzer K, Ngoepe MA: The prediction of condom use intention among South African university students. *Psychol Rep* 2004, 95(2):407–417.
74. Ajzen I: The theory of planned behavior. *Organ Behav Hum Decis Process* 1991, 50:179–211.
75. Conner M, Armitage CJ: Extending the theory of planned behavior: a review and avenues for future research. *J Appl Soc Psychol* 1998, 28(15):1429–1464.
76. Halpern-Felsher BL, Kropp RY, Boyer CB, Tschann JM, Ellen JM: Adolescents' self-efficacy to communicate about sex: its role in condom attitudes, commitment, and use. *Adolescence* 2004, 39(155):443–456.
77. Perkins HW: Social norms and the prevention of alcohol misuse in collegiate contexts. *J Stud Alcohol Suppl* 2002, (14):164–172.
78. Lewis MA, Lee CM, Patrick ME: Gender-specific normative misperceptions of risky sexual behavior and alcohol-related risky sexual behavior. *Sex Roles* 2007, 57:81–90.
79. Cherie A, Berhane Y: Peer pressure is the prime driver of risky sexual behaviors among school adolescents in Addis Ababa, Ethiopia. *World J AIDS* 2012, 2(3):159–164.
80. Le TN, Kato T: The role of peer, parent, and culture in risky sexual behavior for Cambodian and Lao/Mien adolescents. *J Adolesc Health* 2006, 38(3):288–296.
81. Bronfenbrenner U: Toward an experimental ecology of human development. *Am Psychol* 1977, 32(7):513–531.
82. DiClemente RJ, Salazar LF, Crosby RA, Rosenthal SL: Prevention and control of sexually transmitted infections among adolescents: the importance of a socio-ecological perspective – a commentary. *Public Health* 2005, 119(9):825–836.
83. Agardh A, Emmelin M, Muriisa R, Ostergren PO: Social capital and sexual behavior among Ugandan university students. *Glob Health Action* 2010, 3.
84. Agardh A, Tumwine G, Asamoah BO, Cantor-Graae E: The invisible suffering: sexual coercion, interpersonal violence, and mental health – a cross-sectional study among university students in south-western Uganda. *PloS One* 2012, 7(12):e51424.
85. Derogatis LR, Lipman RS, Rickels K, Uhlenhuth EH, Covi L: The Hopkins Symptom Checklist (HSCL): a self-report symptom inventory. *Behav Sci* 1974, 19(1):1–15.

86. Ventevogel P, De Vries G, Scholte WF, Shinwari NR, Faiz H, Nassery R, van den Brink W, Olff M: Properties of the Hopkins Symptom Checklist-25 (HSCL-25) and the Self-Reporting Questionnaire (SRQ-20) as screening instruments used in primary care in Afghanistan. *Soc Psychiatry Psychiatr Epidemiol* 2007, 42(4):328–335.
87. Lee B, Kaaya SF, Mbwambo JK, Smith-Fawzi MC, Leshabari MT: Detecting depressive disorder with the Hopkins Symptom Checklist-25 in Tanzania. *Int J Soc Psychiatry* 2008, 54(1):7–20.
88. Lundberg P, Cantor-Graae E, Rukundo G, Ashaba S, Ostergren PO: Urbanicity of place of birth and symptoms of psychosis, depression and anxiety in Uganda. *Br J Psychiatry* 2009, 195(2):156–162.
89. Lewin B: Sex I Sverige, Om Sexual- Livet I [Sex in Sweden, About Sexual Life in Sweden]. Stockholm: Statens Folkhalsainstitut; 1999.
90. Agardh A, Östergren PO, Liljestrand J: Sexual Patterns among Youth in Mbarara District, Uganda with a Special Focus on Coercion and Power Relations. Bangkok: International Conference on AIDS; 2004.
91. Subramanian SV, Kim DJ, Kawachi I: Social trust and self-rated health in US communities: a multilevel analysis. *J Urban Health* 2002, 79(4 Suppl 1):S21–34.
92. Hanson BS, Ostergren PO, Elmståhl S, Isacson SO, Ranstam J: Reliability and validity assessments of measures of social networks, social support and control – results from the Malmö Shoulder and Neck Study. *Scand J Soc Med* 1997, 25(4):249–257.
93. Rothman KJ, Greenland S, Lash TL: *Modern Epidemiology*, 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2008.
94. Manlove J, Ryan S, Franzetta K: Contraceptive use patterns across teens' sexual relationships: the role of relationships, partners, and sexual histories. *Demography* 2007, 44(3):603–621.
95. Manlove J, Ryan S, Franzetta K: Patterns of contraceptive use within teenagers' first sexual relationships. *Perspect Sex Reprod Health* 2003, 35(6):246–255.
96. Manning WD, Longmore MA, Giordano PC: The relationship context of contraceptive use at first intercourse. *Fam Plann Perspect* 2000, 32(3):104–110.
97. Ford K, Sohn W, Lepkowski J: Characteristics of adolescents' sexual partners and their association with use of condoms and other contraceptive methods. *Fam Plann Perspect* 2001, 33(3):100–105, 132.
98. Kelly RJ, Gray RH, Sewankambo NK, Serwadda D, Wabwire-Mangen F, Lutalo T, Wawer MJ: Age differences in sexual partners and risk of HIV-1 infection in rural Uganda. *J Acquir Immune Defic Syndr* 2003, 32(4):446–451.
99. Uganda Bureau of statistics (UBOS), ICF International: Uganda Demographic Health Survey 2011. Kampala; 2012.
100. Biddlecom AE, Munthali A, Singh S, Woog V: Adolescents' views of and preferences for sexual and reproductive health services in Burkina Faso, Ghana, Malawi and Uganda. *Afr J Reprod Health* 2007, 11(3):99–110.



101. Cheng Y, Gno X, Li Y, Li S, Qu A, Kang B: Repeat induced abortions and contraceptive practices among unmarried young women seeking an abortion in China. *Int J Gynaecol Obstet* 2004, 87(2):199–202.
102. Slaymaker E, Bwanika JB, Kasamba I, Lutalo T, Maher D, Todd J: Trends in age at first sex in Uganda: evidence from Demographic and Health Survey data and longitudinal cohorts in Masaka and Rakai. *Sex Transm Infect* 2009, 85 Suppl 1:i12–19.
103. Testa M, Parks KA: The role of women's alcohol consumption in sexual victimization. *Aggress Violent Behav* 1996, 1(3):217–234.
104. Testa M, Vanzile-Tamsen C, Livingston JA, Buddie AM: The role of women's alcohol consumption in managing sexual intimacy and sexual safety motives. *J Stud Alcohol* 2006, 67(5):665–674.
105. Monks SM, Tomaka J, Palacios R, Thompson SE: Sexual victimization in female and male college students: examining the roles of alcohol use, alcohol expectancies, and sexual sensation seeking. *Subst Use Misuse* 2010, 45(13):2258–2280.
106. Kafuko A, Bukuluki P: Qualitative Research in Uganda on Knowledge, Attitudes and Practices Concerning Alcohol. Kampala: Young Empowered and Healthy (YEAH); 2008.
107. Yan H, Chen W, Wu H, Bi Y, Zhang M, Li S, Braun KL: Multiple sex partner behavior in female undergraduate students in China: a multi-campus survey. *BMC Public Health* 2009, 9:305.
108. Scaramella LV, Conger RD, Simons RL, Whitbeck LB: Predicting risk for pregnancy by late adolescence: a social contextual perspective. *Dev Psychol* 1998, 34(6):1233–1245.
109. Resnick MD, Bearman PS, Blum RW, Bauman KE, Harris KM, Jones J, Tabor J, Beuhring T, Sieving RE, Shew M, et al.: Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. *JAMA* 1997, 278(10):823–832.
110. Hallfors D, Vevea JL, Iritani B, Cho H, Khatapoush S, Saxe L: Truancy, grade point average, and sexual activity: a meta-analysis of risk indicators for youth substance use. *J Sch Health* 2002, 72(5):205–211.
111. Zuma K, Setswe G, Ketye T, Mzolo T, Rehle T, Mbelle N: Age at sexual debut: a determinant of multiple partnership among South African youth. *Afr J Reprod Health* 2010, 14(2):47–54.
112. Lundberg P, Rukundo G, Ashaba S, Thorson A, Allebeck P, Ostergren PO, Cantor-Graae E: Poor mental health and sexual risk behaviours in Uganda: a cross-sectional population-based study. *BMC Public Health* 2011, 11:125.
113. Babalola S: Gender differences in the factors influencing consistent condom use among young people in Tanzania. *Int J Adolesc Med Health* 2006, 18(2):287–298.
114. Langen TT: Gender power imbalance on women's capacity to negotiate self-protection against HIV/AIDS in Botswana and South Africa. *African Health Sci* 2005, 5(3):188–197.

115. Prata N, Vahidnia F, Fraser A: Gender and relationship differences in condom use among 15–24-year-olds in Angola. *Int Fam Plan Perspect* 2005, 31(4):192–199.
116. Norton TR, Bogart LM, Cecil H, Pinkerton SD: Primacy of affect over cognition in determining adult men's condom-use behavior: a review. *J Appl Soc Psychol* 2005, 35(12):2493-2534.
117. Aschengrau A, Seage GR: *Essentials of Epidemiology in Public Health*, 2nd ed. Sudbury, MA: Jones and Bartlett; 2008.
118. Rothman KJ: *Epidemiology: An Introduction*. New York: Oxford University Press; 2002.
119. Jager KJ, Zoccali C, Macleod A, Dekker FW: Confounding: what it is and how to deal with it. *Kidney Int* 2008, 73(3):256–260.

