Between love and fear - determinants of sexual behavior among Ugandan university students

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Between Love and Fear

- determinants of sexual behavior among Ugandan university students

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Sexuality is an ever-present aspect of daily life, whether as flirtation, manipulation, or as a coming together of consenting individuals. From the need to be touched, to the longing for validation, to the quest for ecstasy, the unspoken aim of much social interaction is sexual intimacy. The many factors that influence sexual decision-making and sexual behavior make this a complex yet vital area for study. While the motivations may be many and the pleasures great, the consequences may also be grave. It is to an analysis of these determinants of sexual behavior stretching across a spectrum from love to fear in the context of a university population that this study is devoted.

Abstract

Background: More than half of all new HIV infections in sub-Saharan African countries, including Uganda, occur among young people between the ages of 15 and 24, the most sexually active period of their lives. Understanding the contextual determinants of sexual behavior in this group is crucial in combating the pandemic.

Aim: The overall aim of this study was to assess the impact of demographic, religious, social capital, mental health, and sexual coercion factors on risky sexual behavior among a student population in Uganda in order to gain a deeper understanding of the forces that shape sexual behavior of young people with the purpose of contributing to policy formulation and implementation of more effective interventions to prevent the spread of HIV/AIDS.

Method: In 2005, 980 Ugandan university students responded to a self-administered questionnaire (response rate 80%) that assessed socio-demographic, social capital, and religious factors, as well as alcohol use, mental health, experience of sexual coercion, age of sexual debut, number of sexual partners, and condom use. Mental health was assessed using items from the Hopkins Symptoms Checklist-25 (HSCL-25) and the Symptom Checklist-90 (SCL-90). Logistic regression analysis was applied as the main analytical tool, and synergistic effects between some of the main determinants were investigated.

Results: Thirty-seven percent of the male and 49% of the female students had not previously had sexual intercourse. Of the male and female students with sexual experience, 46% of the males and 23% of the females had had three or more lifetime sexual partners, and 32% of the males and 38% of the females did not consistently use condoms with a new partner. Minor importance of religion in one's family while growing up was correlated to a statistically significant degree with early sexual debut and having many sexual partners (OR 1.7, 95% CI: 1.2–2.4 and OR 1.6, 95% CI: 1.1–2.3, respectively). Being of Protestant faith interacted with gender among those who had debuted sexually. Protestant female students were more likely to have had three or more sexual partners; the opposite was true for Protestant male students. Non-dominant bridging trust among male students was associated with a higher risk for having had many sexual partners (OR 1.8, 95% CI: 1.2–2.9). Low trust in others was associated with a greater likelihood of sexual debut in men, while the opposite was true in women. A similar pattern was seen regarding a high number of lifetime sexual partners in individuals who were raised in families where religion played a major role. After controlling for potential confounding factors, high scores on depression and a high number of sexual partners were significantly associated among both males (OR 2.0, 95% CI: 1.2–3.3) and females (OR 3.3, 95% CI: 1.3–8.6). Elevated anxiety scores among men were associated with a high number of sexual partners (OR 1.9, 95% CI: 1.1–3.3) and inconsistent condom use (OR 1.9, 95% CI: 1.1–3.6). Experience of sexual coercion was found to be statistically significantly associated with previously had sex (OR 1.6, 95% CI: 1.1–2.3), early

sexual debut (OR 2.4, 95% CI: 1.5–3.7), as well as with having had a high number of sexual partners (OR 1.9, 95% CI: 1.2–3.0), but not with inconsistent condom use. Good mental health scores, reporting high trust in others, or stating that religion played a major role in one's family of origin seemed to buffer the effect that the experience of sexual coercion had on the likelihood of having many sexual partners.

Conclusion: Religion, social capital, mental health, and sexual coercion appear to be important determinants of sexual behavior among Ugandan university students. Using such knowledge, one may design and implement more effective programs to prevent the spread of HIV/AIDS. Policy makers would benefit from involving young people in the planning of interventions against HIV/AIDS, and in the formulation and implementation of youth-friendly policies to better understand how strategies should be tailored in relation to the needs of the target group. It would also be desirable to introduce coordinated youth-friendly health services to address both the psychological as well as the sexual and reproductive health-related concerns of young people.

Abbreviations

ABC	Abstinence, Be faithful, Condom use
AFS	Age at First Sex
AIDS	Acquired Immunodeficiency Syndrome
CI	Confidence Interval
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
HEP	Heavy Episodic Drinking
HIV	Human Immunodeficiency Virus
HSCL-25	Hopkins Symptom Check List-25
MUST	Mbarara University of Science and Technology
NGO	Non-Governmental Organization
OR	Odds Ratio
PAR	Population Attributable Risk
PEPFAR	President's Emergency Plan for AIDS Relief
SCEL-90	Symptom Checklist-90
SES	Socio-economic Status
SIDA	Swedish International Development Cooperation Agency
SRHR	Sexual and Reproductive Health and Rights
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
TASO	The AIDS Support Organization
US	United States of America
WHO	World Health Organization

List of publications

I

Agardh A, Tumwine G, Östergren PO: The impact of socio-demographic and religious factors upon sexual behavior among Ugandan university students - a cross-sectional study. (Submitted)

II

Agardh A, Emmelin M, Muriisa R, Östergren PO: Social capital and sexual behavior among Ugandan University Students. *Glob Health Action* 2010, 3:5432

III

Agardh A, Cantor-Graae E, Östergren PO: Youth, sexual risk taking behavior, and mental health: a study of university students in Uganda. (Submitted)

IV

Agardh A, Odberg-Petersson K, Östergren PO: The impact of experience of sexual coercion on risky sexual behavior among Ugandan university students. (Submitted)

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Introduction

Since almost 50% of all new HIV infections worldwide and 61% of all new HIV infections in sub-Saharan Africa occur among young people between the ages of 15 and 24 [1], the most sexually active period of their lives, understanding the contextual determinants of sexual behavior among this population is crucial to combating the AIDS pandemic

In its early phase HIV/AIDS struck Uganda with great severity. In 1995 the estimated prevalence of HIV infection in the adult population was 15% [2]. The response in Uganda was quicker and more efficient than in many similar countries, resulting in a decline from 15% to 5% in the decade between 1991 and 2001 [3, 4].

As the result of a strong national commitment, Uganda was the first country in the world to introduce a multi-sectoral response to HIV/AIDS. In 1986, President Yoweri Museveni and the Ministry of Health established a National AIDS Control Programme and mobilized communities throughout the country by means of NGOs, faith-based organizations, school health programs, and employers [5]. The fact that sexuality was being discussed openly did not prevent religious institutions from supporting preventive efforts, which were primarily based on the so-called ABC strategy: Abstinence from sex before marriage, Being faithful to one's partner, and Condom use to prevent sexually transmitted diseases (STDs) [5]. Numerous studies worldwide have confirmed the role of the ABC factors in controlling the propagation of the HIV/AIDS epidemic, especially among young people [6-8].

Religion and sexual behavior

Religion plays a major role in the lives of young people in Africa. In Uganda it has long been a determinant of social belonging and individual moral values. It has also strongly influenced the socio-political organization of the country [9]. Furthermore, religion also provides researchers with a context for exploring the role of social interaction in sexual relations and the shaping of sexual behavior [10].

A cross-sectional inquiry carried out among young people in Zimbabwe found that religion plays a protective role in sustaining sexual abstinence [11]. Similar results were shown in a population-based study involving people between the ages of 15 and 24 in Côte d'Ivoire [12]. By contrast, an investigation of university students in Nigeria did not show any association between religion and sexual behavior [13].

A limited number of studies have investigated the impact of religion on sexual attitudes and behavior among youth and young adults in Uganda. At Makerere University, more than half of twenty-five students members of the Kampala Pentecostal Church who were interviewed said that they had engaged in sexual activities after being "born-again" [14]. This suggests that the impact of religion on sexual behavior among young people may be strongly dependent on contextual factors and may need to be assessed separately in different countries or regions.

Social capital and sexual behavior

Previous research has documented positive associations between social capital and a range of economic, social, and health outcomes, including sexual behavior. Social capital in epidemiology is most commonly operationalized as trust in others [15], participation [16], and shared values [17]. In theory, the three are strongly interrelated, so that social participation leads to an increased set of shared values among those who participate together (i.e., in religious or other contexts). This in turn enhances trust among such individuals, or throughout society in general, if participation is spread over different areas. A distinction is often made between *bonding* social capital (referring to relations between individuals in a family or those sharing similar socio-demographic characteristics), as opposed to *bridging* social capital (relations between individuals with different backgrounds).

Previous research has documented positive associations between social participation and less risky sexual behavior [18-21]. A study targeting adolescents living in Cape Town, South Africa, concluded that participation in social clubs and community groups was associated with less risky sexual behavior [22]. The authors of another study conducted in the US [23] suggest that low social capital, as measured by Putnam's Comprehensive Social Capital Index [24], was strongly associated with the risk of being infected by chlamydia and AIDS. Campbell, Williams, and Gilgen found that young South African men and women belonging to sports clubs were less likely to be HIV-positive, and that young women who were members of such organizations were more likely to use condoms, as opposed to non-members; female members, however, were also more likely to have casual sexual partners than non-members [25].

In a study by Robert Muriisa, the voluntary sector's response to the HIV/AIDS epidemic has been identified as a factor behind Uganda's success in combating the epidemic [26]. The author suggests that many faith-based groups in Uganda played a major role in effectively using or creating social capital in the local communities as a means of supporting individuals who were at risk of or had become HIV-positive.

Social capital gained from religious networks influence attitudes, norms, and values regarding sexual behavior among young people. Religious groups, particularly the mainstream Protestant church in Uganda, have reacted to the increased openness in sexual matters by launching revivals that places great emphasis on being "saved" or "born again" [27].

The activities of some of the newly established churches have become more visible at Ugandan universities and now constitute a significant part of student social life. These groups all advocate a very strict code of sexual morality, including no premarital sex and monogamous in marriage [28].

Social capital and religious norms thus exert pronounced control on the sexual behavior of young people in Uganda and are significantly intertwined. To the best of our knowledge, few empirical studies have addressed these important issues.

Mental health and sexual behavior

Young adulthood is a challenging period in a person's psychosocial development. The struggle to find and test one's own identity, to "fit in", and to build self-esteem often occurs by experimenting with relationships and sexual behavior.

The onset of mental health problems and the danger of risky sexual behavior both reach a peak in young adulthood. Poor mental health also has strong associations with other health concerns affecting this age group, such as substance abuse and violence [29].

Little focus has been paid to the role of mental health in association with risky sexual behavior in sub-Saharan Africa, although research in high- and middle-income countries has suggested that mental health may play an important role in the correlation between such behavior and HIV/AIDS [30-32].

In the past, the stigma associated with mental illness and the low priority given to psychological wellness has contributed to low investment in mental health for young people by the government of Uganda. However, mental health has become part of the Uganda Health Sector Strategic Plan II, 2005 [33], and child and adolescent mental health have become a focus of the country's new national mental health policy [34]. Despite this effort, mental health services in Uganda remain very limited, especially outside of the capital of Kampala, where they are virtually non-existent for young people.

Since it has been shown that poor mental health can lead to risky sexual behavior, the current situation in Uganda is problematic. By way of comparison, the results of a longitudinal national survey in the US reports an association between depressive symptoms and failure to use condoms on latest occasion of sexual intercourse among high school males [35]. In addition to corroborating the above findings, another study from the US also indicated an association between depression and having had three or more sexual partners in the last 12 months [36]. Though, the results from a community-based cross-sectional study of poor mental health and sexual behavior in South Africa found a strong association between depression and consistent condom use [37]. However, there is insufficient statistical evidence and little research available on mental health and its relation to sexual behavior in low-income countries. Studies are particularly lacking for youth in such settings [37-39]. We have been unable to locate any prior research on the potential association between poor mental health and risky sexual behavior among youth in any low-income country in sub-Saharan Africa.

Sexual coercion and sexual behavior

Sexual coercion is a major issue for many youth in sub-Saharan Africa. There are wide variations in the prevalence of sexual coercion, ranging from a low of between 5% to 20% [40-44] to a high of 50% or more in adolescent and adult populations

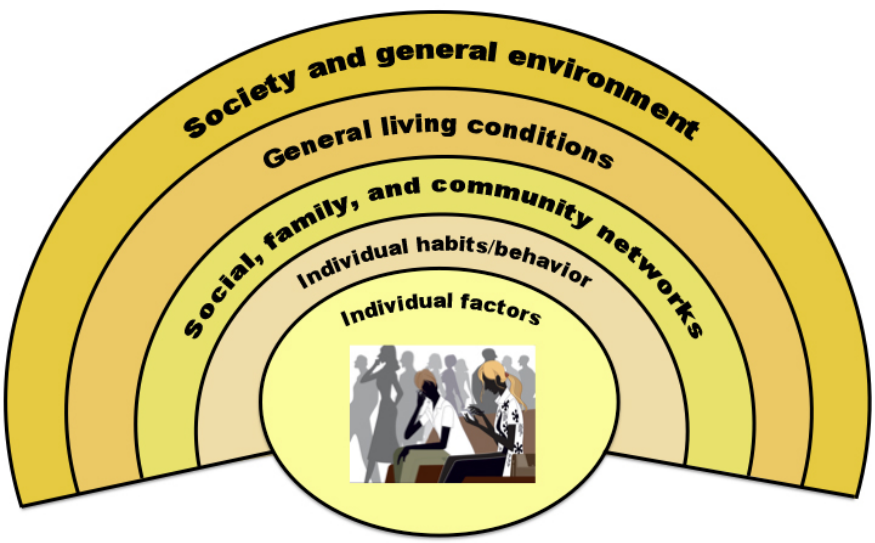
[45-52]. Estimates of the prevalence of sexual coercion point to highs in settings with a considerable prevalence of HIV/AIDS, such as in Southern and East Africa [48, 51, 53-56].

According to national population studies in Uganda, 21% of all unmarried young women between the ages of 15 and 19 have experienced sexual coercion, and 36% of married women of the same ages have been exposed to sexual violence [57]. Previous studies have suggested that the experience of sexual coercion leads to a greater likelihood of risky sexual behavior, namely early sexual debut, many sexual partners, and inconsistent condom use [45, 55, 58-60].

We have found no studies from Uganda or any other high HIV/AIDS prevalence setting investigating the impact of coercion on a range of risky sexual behaviors. Our study seeks to fill that gap by attempting to understand some of the causal mechanisms that are operative in this area and thereby identify factors that might ameliorate the situation.

In conclusion, the determinants of sexual behavior can be found on several conceptual levels, ranging from processes rooted in the structure of a society to factors on the individual level, as illustrated by a much-cited model introduced by Dahlgren and Whitehead in 1992 (Fig 1a) [61].

Fig 1a. Inter-related factors that impact on sexual behavior - I. (Adopted from Dahlgen and Whitehead, *Policies and strategies to promote social equity in health. Background document to WHO - Strategy paper for Europe*, 11 [61])



Aims

General aims

The overall aim of this study was to assess the impact of demographic, religious, social capital, mental health, and sexual coercion factors on risky sexual behavior among a student population in Uganda in order to gain a deeper understanding of the forces that shape sexual behavior of young people with the purpose of contributing to policy formulation and the design and implementation of more effective interventions to prevent the spread of HIV/AIDS.

Specific aims

Study I: The aim of this study was to investigate the relationship between sociodemographic and religious factors, and their impact on sexual behavior among university students in Uganda.

Study II: The aim of this study was to explore the association between social capital and risky sexual behavior among Ugandan university students, with special reference to religious influence.

Study III: The aim of this study was to investigate the relationship between poor mental health and risky sexual behavior (conducive to the spread of HIV/AIDS) among a population of university students in Uganda.

Study IV: The aim of this study was to investigate the impact of sexual coercion on sexual behaviors such as sexual debut, having many sexual partners, and inconsistent condom use among a sample of university students in Uganda. In addition, it sought to determine whether some individual, cultural, or social resources can be protective in countering this impact.

Theoretical framework

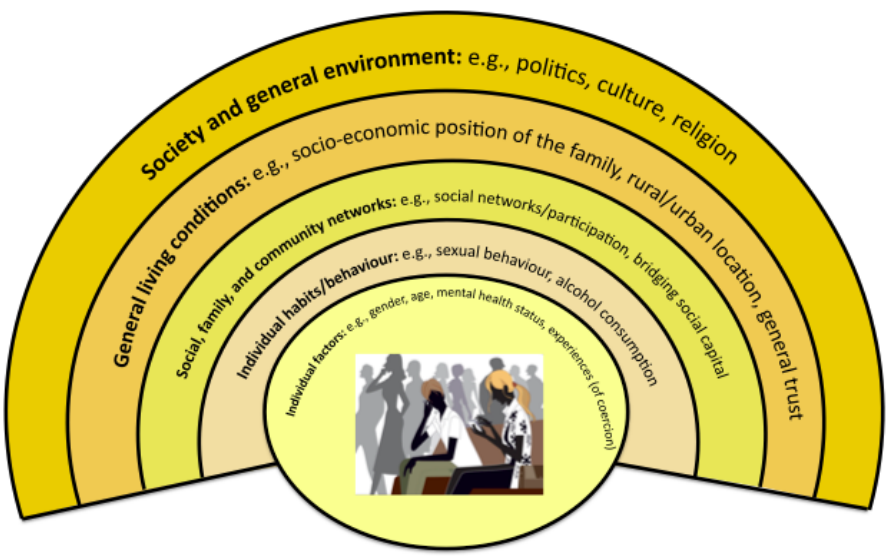
There is a wide variation in the definition of the concept "human sexual behavior". The *Encyclopedia Britannica* has defined it as the

> Tendencies and behavior of human beings with regard to any activity that causes or is otherwise associated with sexual arousal. It is strongly influenced by the genetically inherited sexual response patterns that ensure reproduction . . . societal attitudes toward sex, and each individual's upbringing. Physiology sets only very broad limits on human sexuality; most of the enormous variation found among humans results from learning and conditioning

This definition is derived from a current theoretical framework of sexual behavior, which seems to combine the Freudian idea of human sexual behavior as an individual drive and the rather different notion of the behavior theorists that links it to external stimuli.

The above definition also supports the previous suggestion that determinants of interest for the sexual behaviors that are the focus of this study may be found on three conceptual levels: those within the individual (age, gender, health status, experience, and knowledge), those deriving from the surrounding social context (family influences and social capital), and those coming from the greater socio-political environment (religion and gender relations) (Fig 1b) [61].

Fig 1b. Inter-related factors that impact on sexual behavior - II. (Adopted from Dahlgen and Whitehead, *Policies and strategies to promote social equity in health. Background document to WHO - Strategy paper for Europe*, 11 [61])



In this figure, the four studies comprising the present thesis are graphically outlined, specifically, the first paper exploring the impact of religion at the societal level, the second paper on social capital involving family, friends, and others within the nearby social context (and the greater socio-political environment), the third paper investigating the associations between the mental health status of the individual and sexual behavior, and the fourth paper studying the relations between the experience of sexual coercion on the individual level and sexual behavior.

The analysis of the data for this thesis seeks to embrace the complexity illustrated by the figure above by breaking down the analyses into four distinct areas, each corresponding to one of the four studies on which the thesis is based. These four studies explore both relevant causal pathways, and potential bias by confounding, in a manner illustrated by the figure below (Fig 2).

Fig 2. Description of causal pathways and potential confounding factors.

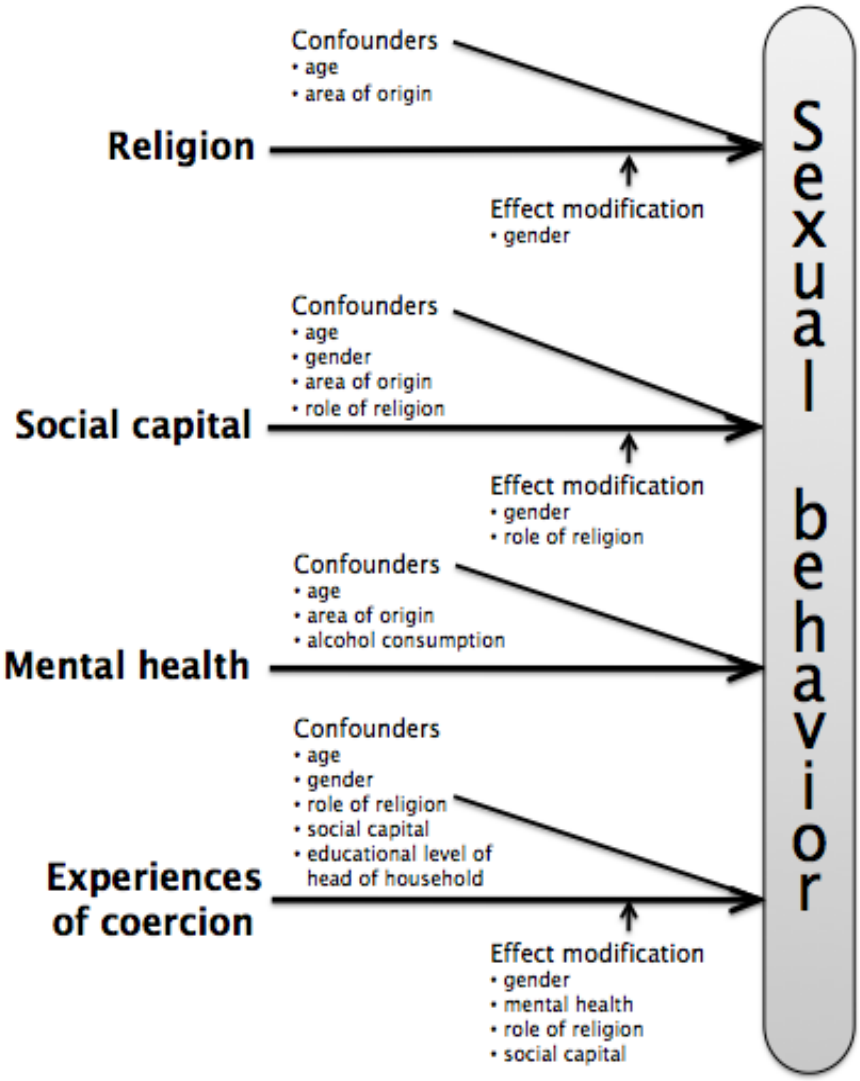


Figure 2 illustrates the direct causal pathway between the main exposure of each study. Further indicated in three cases is the exploration of the other main causal mechanism, namely effect modification by a third variable. We wished to determine whether the effect of the main exposure, (importance of religion in the family of origin on sexual behavior) was modified by the gender of the individual, or whether boys and girls in a religious family are brought up differently regarding sexual matters.

Effect modification and confounding both relate to a "third variable effect", but this effect could represent two very different modalities regarding causality. As mentioned above, effect modification represents a particular causal mechanism, while

confounding indicates the presence of bias, which could distort the result of the analysis if not taken into consideration. Figure 2 presents an overview of how these two "third variable effects" were handled in the analysis of the data, based on the empirical findings of previous studies and theoretical assumptions founded upon the scientific literature in the area.

Material and Methods

The four studies in this thesis are based on data collected by means of a self- administered questionnaire that was distributed to all undergraduate students at Mbarara University of Science and Technology (MUST) in April 2005.

Setting and population

The study was performed at MUST, a public university in the city of Mbarara in southwestern Uganda. The university was founded in 1988 and emphasizes community involvement in its teaching, fieldwork, and research. Our target population consisted of undergraduate students from the university's three faculties of medicine, science, and development studies. The sample comprised the entire undergraduate body of the university in 2005 (n=1220 students).

The HIV prevalence in the Mbarara District was approximately 24% in 1991. By 2001 the prevalence had declined to 10.8%. There are several possible reasons why the HIV epidemic affected southwestern Uganda more than the rest of the country. Because the area comprises a border region, socio-political developments have impacted the population in specific ways. During the regime of Idi Amin in the 1970s, the cross-border traffic between southwestern Uganda, Tanzania, and Rwanda increased, altering the local economy. One result was that many women resorted to prostitution as a means of earning money from the transport workers who spent the night near the border. Once the HIV epidemic had established itself, there was a sharp increase in mortality among young adults. In addition, the prevailing custom that required widows (who may have already been HIV-positive) to marry their husband's brother or closest kinsman may have further accelerated the spread of the infection [26].

Data collection

Data was collected by means of an 11-page self-administered questionnaire consisting of 132 questions. The development of the questionnaire was based on validated instruments used in other studies of a similar nature, and on the outcomes of focus group discussions with youth, including students in Mbarara district. The questionnaire was developed in close collaboration with student representatives and was pretested by ten students. The formulation and interpretation of the more private and sensitive questions were also discussed with the student representatives. The questionnaire was distributed in lecture halls to all undergraduate students at MUST. Students were orally informed beforehand about the purpose of the questionnaire and were given instructions for filling it out. A consent form on the front page also contained a written explanation and justification of the project to be signed by the students as acknowledgement of being informed and agreeing to participate.

Contact details for the principal investigator and a research assistant were provided, in case any questions or personal concerns arose while answering the questions. While students were engaged in filling out the questionnaires, the research staff ensured that the room was silent so that each person could work in private. The consent forms and the questionnaires (the latter without any identifying information) were collected separately and placed in different boxes in the front of the room. A total of 980 students completed the questionnaires, representing 80% of the undergraduate students at MUST.

The questionnaire included assessments of lifestyle factors, such as alcohol consumption, drug use, and smoking habits; relationships, love, and sexuality; social relations, participation, and social capital; mental health; self-rated health; and social and demographic factors, such as area of origin, socio-economic status (SES), religious affiliation, and the role of religion in one's family while growing up.

Definitions of variables

Background variables

Age was divided arbitrarily into two groups at the upper tertile: "younger" ≤ 23 years old and "older" > 23 years old.

Sex was classified as male or female.

Area of origin was categorized as "rural", "urban", or "peri-urban or small town". The variable was dichotomized into "rural" and "urban/peri-urban or small town".

Educational level of head of household during childhood was categorized as "did not finish primary school", "completed primary school", "completed secondary school", "post-secondary school", "college or university", or "other". The variable was dichotomized so that "did not finish primary school" and "completed primary school' were coded as "low" and any education above that was classified as "high".

The role of religion in the family while growing up (Studies I and II)

This variable was categorized as "religion played a big role", "religion was relatively important", "religion was not so important", and "religion was not important at all". The variable was dichotomized, with "religion played a big role" and "religion was relatively important" coded as "major role"; and "religion was not so important" and "religion was not important at all" coded as "minor role".

Religious affiliation during childhood (Study I)
The primary family religion during childhood was reported by selecting one of the following alternatives: "Protestant", "Catholic", "Moslem", "Pentecostal", "Seventh-day Adventist", "Orthodox", and "other". In the final analysis only individuals reporting "Protestant" or "Catholic" denominations were tabulated, since they made up the two major religions in our sample.

Self-rated health

The question: "How do you classify your current health in general?" contained five alternative answers: "very bad", "bad", "fair", "good", and "very good". These were dichotomized into less good (for the first two alternatives) and good (for the remaining three).

Alcohol use variables

Alcohol use—Frequent heavy episodic drinking (Study III)
The question "How often do you drink six 'glasses' or more on the same occasion?" contained the following alternatives: "daily, or almost daily", "every week", "every month"—all of which were coded as "yes"—and "less than once a month" and "never"—which were coded as "no".

Consumed alcohol on latest occasion of sexual intercourse (Study IV)
This variable was coded as "yes" or "no".

Mental health variables

Mental health (Studies III and IV)
The Hopkins Symptom Check List (HSCL-25) was used to assess mental health. This instrument consists of 15 items assessing symptoms of depression, and 10 items assessing symptoms of anxiety during the past week [62]. In addition, 10 items from the Symptom Checklist-90 (SCL-90) were included, i.e., the psychoticism sub-scale, which assesses symptoms of psychoticism during the past week [63]. Each item was graded from (1) "not at all" to (4) "extremely". The SCL-90 is a self-reporting five-point scale developed for the assessment of the psychiatric symptoms. To attain a homogenous classification, we rated the 10 psychoticism items in the same way as anxiety and depression items, i.e., on a scale of 1 to 4. The HSCL-25 and the SCL-90 instruments had been previously validated and employed in different cultural contexts in Africa [63-66].

Mean total mental health scores, as well as scores for depression, anxiety, and psychoticism, were calculated based on the student's total score for each of the measures, then divided by the number of items the student answered. We dichotomized the scores into "high" (i.e., poorer mental health) and "low" (i.e., better mental health), based on the calculation of a median-split between the total scores for each measure. We also calculated prevalence of probable depression using a total score "cut off" point of 31, as indicated by Bolton and Kinyanda [67, 68].

Social capital variables

Trust in others (Studies II and IV)
Trust in others was measured on the basis of answers to four questions commonly used in epidemiological studies [15]: "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 accordingly assigned values from 1 to 4 (the scoring of the first and last items were reversed), yielding a maximum total score of 16. Based on the median score, the variable was dichotomized into "high trust" (above the median) or "low trust" (below the median).

Bridging trust (Study II)
Bridging trust was measured by five response alternatives: "I only trust persons with the same background as my own", "I trust persons with the same background as my own rather more than others", "I trust persons with the same background as my own a bit more than others", "I trust persons with the same background as myself equally as much as others", and "I trust persons with the same background as myself less than others". The variable was then dichotomized with the first three alternatives being coded as "non-dominant bridging trust" and the last two as "dominant bridging trust".

Social participation (Study II)
Social participation was classified on the basis of participation in 12 different social activities in recent months, a measure introduced by Statistics Sweden in the 1970s that has since been scientifically validated [69]. Based on the median, the total scores of those who answered "yes" (maximum total score 12) were dichotomized into "high" (above the median) and "low" (below the median).

Sexual coercion variables

Experience of sexual coercion (Study IV)
The measure of sexual coercion was based on the response "yes" to any of the questions; "You have been forced to show your sexual organ" "Someone has forced you to let them touch your sexual organ", "Someone has forced you to let them suck or lick your sexual organ", "Someone has forced you to let them show you their own 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", "You have been forced to pose for a sex photo or sex film". In the absence of any affirmative answer to the mentioned questions and an affirmative answer to the question "You have not been *forced* into any of these" the individual was classified as unexposed to sexual coercion.

Dependent variables

Sexual behavior variables

Previously had sex (Studies I–IV)
Having previously had sexual intercourse was defined as "yes" or "no", based on responses to the question: "Have you ever had sexual intercourse?"

Age at sexual debut (Studies I and IV)
Age at sexual debut was dichotomized so that having sexual intercourse for the first time before age 19 was coded as "low", and at or above age 19 as "high".

Number of lifetime sexual partners (Studies I, II and IV)
Number of lifetime sexual partners was categorized by responses to the question: "How many sexual partners have you had altogether?" so that ≥ 3 was coded as "high", and < 3 as "low".

Number of sexual partners in last twelve months (Study III)
Number of sexual partners was ascertained by the response to "How many sexual partners have you had during the last twelve months?" The variable was dichotomized so that ≥ 2 was coded as "high" and < 1 as "low".

Condom use with new partner (Studies I and II)
The question "How often do you use a condom with a new sexual partner?" had four alternatives: "always", "often", "sometimes", or "never". This was then dichotomized with the first alternative as "always" and the remaining three as "not always".

Condom use on latest occasion of sexual intercourse (Studies III and IV)
Condom use on latest occasion of sexual intercourse was determined by asking "Did you use any *method* for avoiding sexually transmitted diseases on your latest occasion of sexual intercourse?" The variable was then dichotomized, so that the responses "no" and "yes, other" were coded as "inconsistent", and "yes, condom" was coded as "consistent".

Statistical methods

Sample size was given since we assessed all the students at the university, but a formal check revealed that in most analyses a 75% increase of risk could be ascertained at 80% probability. This did not exclude the risk of not being able to detect some true effects of moderate size.

The statistical analyses were done with SPSS Version 16.0. Logistic regressions were performed to calculate the crude odds ratios (OR) and 95% confidence intervals (CI) for having previously had sex (Studies I–IV), the effect on age at sexual debut (Studies I and IV), number of lifetime sexual partners (Studies I, II, and IV), number of sexual partners in last 12 months (Study III), condom use with new partner

(Studies I–II) and consistent condom use (Studies III-IV). Differences between men and women regarding prevalence of the variables used were calculated by means of Chi-square values upon which the *p*-values shown in Table 1 were based. Only cases where information was available on all variables in a particular instance were analyzed.

Multivariate logistic regression was used to investigate the association between role of religion, religious affiliation, and sexual behavior (Study I): social capital and sexual behavior (Study II): mental health and sexual behavior (Study III): and experience of sexual coercion and sexual behavior (Study IV).

The effect of these variables on sexual behavioral factors was adjusted for age and area of origin (Study I), age, gender, area of origin, and role of religion (Study II), age, gender, area of origin, and frequent heavy episodic drinking (Study III), and age, gender, educational level of household, role of religion, and trust in others (Study IV). OR and 95% CI were used as measures of association. The analyses in Studies I and III were performed separately for males and females. Significance level was accepted at $p < 0.05$, two-tailed.

An additional analytical step was taken to disclose effect modification between the variables chosen (Studies II and IV), and calculated by means of dummy variables, as proposed by Rothman [70], according to whom a synergistic effect is present when a dependent variable has a greater impact on an outcome in the presence or absence of a third variable (i.e., the association becomes "more than additive").

Results

A total of 980 students responded to our questionnaire, representing 80% of all registered undergraduate students at MUST (n = 1220). Thirty-five percent of the respondents were female (n = 347) and 65% were male (n = 633).

Table 1 shows the distribution of socio-demographic factors, self-rated health, social capital, use of alcohol, and experience of sexual coercion, as well as the outcome variables: having previously had sexual intercourse, age at sexual debut, number of sexual partners (in the last twelve months and lifetime partners), consistent condom use, and use of a condom on latest occasion of sexual intercourse. About one-third of the students were above 23 years of age, with female students being somewhat younger than males. Among the male students, 50.6% came from rural areas; the corresponding percentage among females was 31.0%.

A large majority of the total student population (74.5%) came from families in which the head of household had achieved a high educational level (secondary school or above). Fifty-three point eight percent of the males and 59.8% of the females reported that religion played a major role in their family of origin. Low

trust in others was reported by a similar proportion of females than males (39.2% and 40.2%, respectively). A larger proportion of females than males reported low social participation (55.3% and 47.6%, respectively). About half of the students reported non-dominant bridging trust, with the proportions similar among males and females. Almost one-third, 31.1% (33.1 % of the female participants and 29.9 % of the males), reported that they had experienced sexual coercion at some point in their lives.

Significantly more males than females reported having previously had sexual intercourse (62.9% vs. 51.3%, respectively). About half of the students had made their sexual debut by the age of 18. A survival analysis was performed to estimate the mean age of sexual debut, which was 17.9 years (95% CI 17.5–18.2) in the sample (data not shown). In the group of those who indicated that they had previously had sex, 45.9% of the males and 23.1% of the females reported having had three or more partners. A smaller proportion of males (31.5%) than females (37.8%) stated that they do not always use a condom with a new partner.

Table 1. Prevalence of socio-demographic factors, social capital, alcohol use, self-rated health and sexual behavior among university students in Uganda

	All		Male		Female		x^2
	n	%	n	%	n	%	*p*
Sex							
Male	633	64.6					
Female	347	35.4					
Age							
Younger ≤ 23	628	65.6	378	60.6	250	75.1	0.000
Older > 23	329	34.4	246	39.4	83	24.9	
Missing	(23)		(9)		(14)		
Area of origin							
Rural	424	43.7	318	50.6	106	31.0	0.000
Urban/ peri-urban	546	56.3	310	49.4	236	69.0	
Missing	(10)		(5)		(5)		
Educational level of head of household							
≤ Primary	235	25.5	186	31.0	49	15.2	0.000
>Primary school	688	74.5	414	69.0	274	84.8	
Missing	(57)		(33)		(24)		
Importance of religion							
Major role	542	55.9	337	53.8	205	59.8	0.079
Minor role	427	44.1	289	46.2	138	40.2	
Missing	(11)		(7)		(4)		
Religious affiliation							
Protestant	415	42.8	273	43.5	142	41.4	0.439
Catholic	379	39.1	248	39.6	131	38.2	
Moslem	86	8.9	56	8.9	30	8.7	
Pentecostal	45	4.6	24	3.8	21	6.1	
Seventh Day Adventist	22	2.3	15	2.4	7	2.0	
Orthodox	8	0.8	4	0.6	4	1.2	
Other	15	1.5	7	1.1	8	2.3	
Missing	(10)		(6)		(4)		
Trust in Others							
Low	360	39.8	126	39.2	234	40.2	0.777
High	544	60.2	196	60.8	348	59.8	
Missing	(76)		(25)		(51)		

Social participation							
High	487	49.7	155	44.7	332	52.4	0.023
Low	493	50.3	192	55.3	301	47.6	
Missing	(0)		(51)		(25)		
Bridging trust							
Dominant	426	52	156	50.6	270	46.7	0.260
Non-dominant	461	48	152	49.4	309	53.3	
Missing	(93)		(54)		(39)		
Frequent Heavy Episodic Drinking[1]							
Yes	144	16.6	32	32.7	112	41.3	0.001
No	225	83.4	66	67.3	159	58.7	
Missing	(34)		(24)		(10)		
Consumed alcohol on latest occasion of sexual intercourse[1]							
Yes	122	23.9	83	23.2	39	25.5	0.651
No	388	76.1	274	76.8	114	74.5	
Missing	(22)						
Experience of sexual coercion							
Yes	246	31.1	153	29.9	93	33.1	0.378
No	546	68.9	358	70.1	188	66.9	
Missing	(188)						
Self-rated health							
Good	730	85.1	476	85.9	254	83.6	0.368
Less good	128	14.9	78	14.1	50	16.4	
Missing	(122)		(79)		(43)		
Previously had sex							
Yes	532	59.0	376	62.9	156	51.3	0.001
No	370	41.0	222	37.1	148	48.7	
Missing	(78)		(35)		(43)		
Age at sexual debut[1]							
≤ 18 = low	262	51.2	199	55.0	63	42.0	0.009
> 18 = high	250	48.8	163	45.0	87	58.0	
Number of lifetime sexual partners[2]							
1–2 = low	293	61.0	180	54.1	113	76.9	0.000
≥ 3 = high	187	39.0	153	45.9	34	23.1	
Missing	(52)		(43)		(9)		
Number of sexual partners in last 12 months[2]							
1 = low	284	64.4	105	75.0	179	59.5	0.002
≥ 2 = high	157	35.6	35	25.0	122	40.5	
Condom use with a new partner[2]							
Always	324	66.7	235	68.5	89	62.2	0.205
Not always	162	33.3	108	31.5	54	37.8	
Missing	(46)		(33)		(13)		
Used a condom on latest occasion of sexual intercourse[2]							
Consistent	424	82.7	306	85.2	118	76.6	0.022
Inconsistent	89	17.3	53	14.8	36	23.4	
Missing	(19)		(17)		(2)		

[1]Only analyzed among individuals who drank alcohol
[2] Only analyzed among individuals who had had sexual intercourse

Study I

The aim of this study was to investigate the relationship between socio-demographic and religious factors and their impact on sexual behavior.

Based on the findings of the associations between socio-demographic factors and sexual behavior, two variables (role of religion and religious affiliation) were chosen as the main determinants of sexual behaviors for further investigation. We adjusted for potential confounding due to age and rural origin by employing multivariate logistic regression.

Table 2a-b presents the adjusted OR with 95% CI for associations between the determinants mentioned and religious affiliation vis-à-vis the dependent variables (i.e., the sexual behaviors studied) stratified by sex. Two models were used: the first one adjusted for age, and the second for age and area of origin. Among male students, a larger proportion in the group stating that religion did not play a major role in their family had an increased risk of early sexual debut (OR 1.5, 95% CI 1.01–2.4); female students in the same group had a greater risk of having had a high number of lifetime sexual partners (OR 2.8, 95% CI 1.2–6.5) after adjusting for age and rural origin. Protestant religious affiliation was negatively associated with having previously had sexual intercourse among female students (OR 0.5, 95% CI 0.3–0.9), compared with Catholic female students; Protestant male students had a statistically lower risk for having had a high number of lifetime sexual partners (OR 0.6, 95% CI 0.4–0.99), even after adjusting for age and rural origin.

Table 2a. Association (OR95 % CI) between role of religion and sexual behavior

Sexual behavior factor	Model 1 (adjusted for age)		Model 2 (adjusted for age and area of origin)	
	Female (n=304)	Male (n=598)	Female (n=299)	Male (n=593)
Previously had sex				
Minor role of religion	1.0 (0.6–1.7)	1.4 (0.98–2.0)	1.0 (0.6–1.6)	1.4 (0.98–2.0)
Older	2.2 (1.3–3.8)	1.4 (0.98–1.9)	2.3 (1.3–4.0)	1.9 (1.3–2.7)
Rural			1.1 (0.6–1.8)	1.4 (0.99–2.0)
Low age of sexual debut				
Minor role of religion	1.7 (0.9–3.3)	1.5 (0.99–2.3)	1.7 (0.9–3.4)	1.5 (1.01–2.4)
Older	0.9 (0.4–1.8)	0.6 (0.4–0.9)	0.9 (0.4–1.8)	0.6 (0.4–0.9)
Rural			0.6 (0.3–1.2)	1.0 (0.6–1.5)
High number of lifetime sexual partners				
Minor of religion	2.8 (1.2–6.4)	1.3 (0.8–2.0)	2.8 (1.2–6.5)	1.3 (0.9–2.1)
Older	2.3 (0.97–5.3)	1.1 (0.7–1.8)	2.3 (0.97–5.3)	1.1 (0.7–1.8)
Rural			0.7 (0.3–1.8)	0.9 (0.6–1.3)
Did not always use condom with new partner				
Minor role of religion	0.9 (0.5–1.9)	1.0 (0.7–1.6)	0.9 (0.5–1.8)	1.1 (0.7–1.7)
Older	1.0 (0.5–2.0)	1.1 (0.7–1.7)	1.0 (0.5–2.0)	1.0 (0.7–1.6)
Rural			1.1 (0.5–2.3)	1.1 (0.7–1.8)

Table 2b. Association (OR 95% CI) between religious affiliation and sexual behavior

Sexual behavior factor	Model 1 (adjusted for age)		Model 2 (adjusted for age and area of origin)	
	Female	Male	Female	Male
Previously had sex				
Protestant	0.5 (0.3–0.9)	1.2 (0.8–1.8)	0.5 (0.3–0.9)	1.2 (0.8–1.7)
Older	2.5 (0.3–0.9)	2.2 (1.5–3.3)	2.5 (1.3–4.8)	2.1 (1.4–3.2)
Rural			1.2 (0.7–2.2)	1.5 (1.01–2.2)
Low age of sexual debut				
Protestant	0.7 (0.3–1.5)	0.9 (0.6–1.5)	0.8 (0.4–1.8)	0.9 (0.6–1.5)
Older	0.5 (0.2–1.2)	0.6 (0.4–0.97)	0.5 (0.2–1.2)	0.6 (0.4–0.97)
Rural			0.5 (0.2–1.1)	1.0 (0.6–1.5)
High number of lifetime sexual partners				
Protestant	2.0 (0.8–5.0)	0.6 (0.4–0.97)	2.1 (0.9–5.4)	0.6 (0.4–0.99)
Older	1.6 (0.6–4.1)	0.9 (0.6–1.5)	1.6 (0.6–4.2)	1.0 (0.6–1.6)
Rural			0.7 (0.3–2.1)	0.8 (0.5–1.3)
Did not always use condom with new partner				
Protestant	0.6 (0.3–1.3)	1.1 (0.7–1.8)	0.6 (0.3–1.4)	1.1 (0.7–1.8)
Older	0.7 (0.3–1.7)	1.0 (0.6–1.6)	0.7 (0.3–1.7)	1.0 (0.6–1.6)
Rural			0.7 (0.3–1.7)	1.4 (0.9–2.4)

This study found a statistically significant correlation between two sets of factors: importance of religion and religious denomination in relation to sexual debut and number of lifetime sexual partners. Gender tended to modify the effect of role of religion.

Study II

The aim of this study was to explore the association between social capital and risky sexual behavior, with special reference to religious influence.

Table 3a-b presents the adjusted OR with 95% CI for associations between trust in others and bridging trust, on the one hand, and the dependent variables, on the other. These variables were chosen as determinants of sexual behavior based on the findings of the associations between socio-demographic factors and social capital in relation to sexual behavior. Three models were used, with the confounding factors introduced stepwise, beginning with age and gender, then area of origin, and finally role of religion.

The association persisted between the variables low trust in others and did not always use condom with new partner, even after adjusting for age, gender, area of origin, and role of religion. Moreover, the association between non-dominant bridging trust and high number of lifetime sexual partners also persisted after adjusting for age, gender, rural origin, and role of religion.

Table 3a. Association (Odds Ratios, 95% Confidence Intervals) between trust in others and sexual behavior in a sample of Ugandan university students. Results of multivariate logistic regression analyses.

Sexual behavior factor	Model 1 (adjusted for age and gender)	Model 2 (adjusted for age, gender, and area of origin)	Model 3 (adjusted for age, gender, area of origin, and role of religion)
Previously had sex			
Low trust in others	1.0 (0.7–1.3)	1.0 (0.7–1.3)	1.0 (0.7–1.3)
Rural		1.2 (0.9–1.6)	1.2 (0.9–1.7)
Minor role of religion			1.3 (0.95–1.7)
High number of lifetime sexual partners			
Low trust in others	1.0 (0.7–1.5)	1.0 (0.7–1.5)	1.0 (0.6–1.5)
Rural		0.8 (0.5–1.1)	0.8 (0.5–1.2)
Minor role of religion			1.8 (1.2–2.7)
Did not always use condom with new partner			
Low trust in others	1.6 (1.1–2.4)	1.6 (1.1–2.4)	1.6 (1.1–2.4)
Rural		1.2 (0.8–1.8)	1.2 (0.8–1.8)
Minor role of religion			1.0 (0.6–1.5)

Table 3 b. Association (Odds Ratios, 95% Confidence Intervals) between bridging trust and sexual behavior in a sample of Ugandan university students. Results of multivariate logistic regression analyses.

Sexual behavior factor	Model 1 (adjusted for age and gender)	Model 2 (adjusted for age, gender, and area of origin)	Model 3 (adjusted for age, gender, area of origin, and role of religion)
Previously had sex			
Non-dominant bridging trust	1.1 (0.9–1.5)	1.1 (0.9–1.5)	1.1 (0.8–1.5)
Rural		1.6 (0.9–1.7)	1.2 (0.9–1.7)
Minor role of religion			1.2 (0.9–1.7)
High number of lifetime sexual partners			
Non-dominant bridging trust	1.8 (1.2–2.6)	1.8 (1.2–2.6)	1.8 (1.2–2.7)
Rural		0.8 (0.5–1.2)	0.8 (0.5–1.2)
Minor role of religion			1.6 (1.1–2.4)
Did not always use condom with new partner			
Non-dominant bridging trust	1.0 (0.7–1.5)	1.0 (0.7–1.4)	1.0 (0.7–1.4)
Rural		1.4 (0.9–2.1)	1.4 (0.9–2.1)
Minor role of religion			1.0 (0.7–1.5)

To further explore the pattern of association between factors of social capital and sexual behavior, we analyzed the possible effect modification between gender and "trust in others" plus "bridging trust" in relation to the outcome variables "previously had sex" and "number of sexual partners" (Table 4).

We found that trust in others had opposite effects among men and women. Men who reported low trust in others tended to have a 50% greater likelihood of having previously had sex (OR 1.5, 95% CI 0.98–2.2), while women reporting low trust in others had a 40% lower probability of previously having had sex, a statistically significant finding (OR 0.6, 95% CI 0.3–0.9). A similar difference in the impact of low trust in others was demonstrated regarding number of sexual partners. Furthermore, men with non-dominant bridging trust had a comparatively greater risk of having had a high number of sexual partners than women with social capital of this type.

Table 4. Analysis of effect modification between trust in others/bridging trust and sex regarding "previously had sex" and "high number of lifetime sexual partners" in a sample of Ugandan university students (n = 980), presented as adjusted Odds Ratios, 95% Confidence Intervals (CI)

Sex and Trust in others	Previously had sex	
	All n (%)	Odds Ratios (CI)
Sex/Trust in others		
Female/High trust	173 (21)	1 (ref)
Male/High trust	330 (39)	1.1 (0.8–1.6)
Female/Low trust	111 (13)	0.6 (0.3–0.9)
Male/Low trust	223 (27)	1.5 (0.98–2.2)
(Missing)	(143)	
Total	980	
Sex and Trust in others/Bridging trust	High number of lifetime sexual partners	
	All n (%)	Odds Ratios (CI)
Sex/Trust in others		
Female/High trust	93 (22)	1 (ref)
Male/High trust	179 (40)	2.4 (1.4–4.2)
Female/Low trust	45 (10)	0.8 (0.3–1.8)
Male/Low trust	125 (28)	2.7 (1.5–4.9)
(Missing)	(90)	
Total	532	
Sex/Bridging trust		
Female/Dominant bridging trust	67 (15)	1 (ref)
Male/Dominant bridging trust	143 (32)	2.7 (1.3–5.3)
Female/Non-dominant bridging trust	69 (15)	1.5 (0.7–3.3)
Male/ Non-dominant bridging trust	168 (38)	4.7 (2.4–9.2)
(Missing)	(85)	
Total	532	

[a] Adjusted for age

Table 5a-b shows a synergistic effect between religion "played a minor role" and "low trust in others" in their bearing on "previously had sex", but only among males. The same was true for the effect of "religion played a minor role" and "non-dominant bridging trust" on "high number of sexual partners", but this time only among females. Women indicating non-dominant bridging trust and "religion played a minor role" were more likely to have had a high number of sexual partners than could be expected from the increased risk previously demonstrated for these factors.

Table 5a. Analysis of effect modification between trust in others/bridging trust and role of religion regarding "previously had sex" in a sample of Ugandan university students (n = 980), presented as adjusted Odds Ratios with 95% Confidence Intervals (CI)

Role of religion and Trust in others/Bridging trust	Previously had sex					
	All		Female		Male	
	n (%)	Odds Ratios (95% CI) [a]	n (%)	Odds Ratios (95% CI) [a]	n (%)	Odds Ratios (95% CI)[a]
Role of religion/ Trust in others						
Major role/High trust	280 (34)	1 (ref)	107 (38)	1 (ref)	173 (31)	1 (ref)
Minor role/High trust	219 (26)	1.1 (0.7–1.5)	65 (23)	0.8 (0.5–1.6)	154 (28)	1.2 (0.8–1.8)
Major role/Low trust	176 (21)	1.3 (0.6–1.2)	62 (22)	0.5 (0.2–0.9)	114 (21)	1.1 (0.7–1.8)
Minor role/Low trust	156 (19)	1.3 (0.9–1.9)	48 (17)	0.6 (0.3–1.2)	108 (20)	1.9 (1.1–3.2)
(Missing)	(149)		(65)		(84)	
Total	980		347		633	

[a] Adjusted for age

Table 5b. Analysis of effect modification between trust in others and bridging trust and role of religion regarding "high number of lifetime sexual partners" in a sample of Ugandan university students (n = 980), presented as adjusted Odds Ratios with 95% Confidence Intervals (CI)

Role of religion and Trust in others/Bridging trust	High number of lifetime sexual partners					
	All		Female		Male	
	n (%)	Odds Ratios (95% CI) [a]	n (%)	Odds Ratios (95% CI) [a]	n (%)	Odds Ratios (95% CI) [a]
Role of religion/ Trust in others						
Major role/High trust	150 (34)	1 (ref)	60 (44)	1 (ref)	90 (30)	1 (ref)
Minor role/High trust	120 (27)	1.7 (1.1–2.9)	33 (24)	2.0 (0.8–5.2)	87 (29)	1.5 (0.8–2.7
Major role/Low trust	83 (19)	1.1 (0.6–1.9)	23 (17)	0.4 (0.01–1.9)	60 (20)	1.1 (0.6–2.2
Minor role/Low trust	86 (20)	1.8 (1.1–3.2)	21 (15)	2.0 (0.7–6.0)	65 (21)	1.5 (0.8–2.9
(Missing)	(93)		(19)		(74)	
Total	532		156		376	
Role of religion/Bridging trust						
Major role/Dominant	111 (25)	1 (ref)	39 (29)	1 (ref)	72 (23)	1 (ref)
Minor role/Dominant	97 (22)	1.8 (1.0–3.3)	27 (20)	1.3 (0.4–4.4)	70 (23)	1.9 (0.96–3.
Major role/Non-dominant	129 (29)	1.8 (1.1–3.2)	45 (33)	1.0 (0.3–3.0)	84 (27)	2.3 (1.2–4.6
Minor role/ Non-dominant	107 (24)	2.9 (1.6–5.0)	24 (18)	3.3 (1.03–10.3)	83 (27)	2.6 (1.3–4.9
(Missing)	(88)		(21)		(67)	
Total	532		156		376	

[a] Adjusted for age

Our findings show that social capital factors are significantly associated with sexually risky behaviors among university students in southwestern Uganda. However, some of the social capital factors are differently associated with the sexual behavior among male and female students.

Study III

The aim of this study was to investigate the relationship between poor mental health and risky sexual behavior.

Table 6 presents the adjusted OR with 95% CI for associations between total scores of mental health, depression, anxiety, and psychoticism, and the dependent sexual behavior variables (adjusted for the confounding factors of age, area of origin, and frequent heavy episodic drinking). In the fully-adjusted model, a statistically significant association persisted among males between all mental health factors and a high number of sexual partners.

The significant association between high number of sexual partners and depression among females, and condom use and anxiety among males persisted. No relationships were found between inconsistent condom use and mental health factors among females.

Table 6. Association (OR 95 % CI) between mental health and sexual behavior in a sample of Uganda university students. (All covariates are adjusted for each other.)

Sexual behavior factor	Previously had sex		High number of sexual partners		Inconsistent condom use	
	Female	Male	Female	Male	Female	Male
Poor mental health	1.6 (0.9–2.6)	1.4 (0.98–2.1)	2.4 (0.96–5.8)	2.3 (1.3–3.8)	1.3 (0.6−2.8)	1.2 (0.7−2.2)
Old	2.2 (1.2–4.0)	1.9 (1.3–2.8)	1.0 (0.4–2.6)	1.2 (0.7–2.0)	2.3 (1.01−5.0)	1.4 (0.7−2.5)
Rural	1.1 (0.6–2.0)	1.5 (1.1–2.2)	0.6 (0.2–1.8)	1.0 (0.6–1.7)	0.9 (0.4−2.2)	0.9 (0.5−1.7)
Frequent heavy episodic drinking	3.5 (1.2–10.0)	2.9 (1.7–4.9)	4.7 (1.5–15.2)	2.2 (1.2–3.8)	1.1 (0.4−3.1)	0.6 (0.3−1.2)
Depression	1.4 (0.9-2.4)	1.3 (0.9-1.9)	3.3 (1.3-8.6)	2.0 (1.2-3.3)	1.1 (0.5−2.5)	1.6 (0.9−3.0)
Old	2.2 (1.2-3.9)	1.9 (1.3-2.8)	1.0 (0.4-2.7)	1.1 (0.6-1.8)	2.3(1.03−5.1)	1.4 (0.7−2.5)
Rural	1.1 (0.6-1.9)	1.5 (1.1-2.2)	0.6 (0.2-1.8)	1.1 (0.6-1.8)	0.9 (0.4−2.2)	0.9 (0.5−1.7)
Frequent heavy episodic drinking	3.4 (1.2-9.7)	2.9 (1.7-5.0)	3.4 (1.1-10.9)	2.1 (1.2-3.7)	1.2 (0.4−3.4)	0.5 (0.3−1.1)
Anxiety	1.2 (0.7–2.0)	1.1 (0.8–1.6)	1.1 (0.4–2.7)	1.9 (1.1–3.3)	2.1 (0.9−4.7)	1.9 (1.1−3.6)
Old	2.2 (1.2–4.0)	1.8 (1.2–2.7)	0.7 (0.2–1.9)	1.2 (0.7–2.1)	2.7 (1.2−6.2)	1.4 (0.8−2.6)
Rural	1.0 (0.6–1.9)	1.6 (1.1–2.3)	0.4 (0.1–1.3)	1.0 (0.6–1.7)	1.0 (0.4−2.4)	0.9 (0.5−1.6)
Frequent heavy episodic drinking	3.6 (1.3–10.3)	3.0 (1.7–5.1)	5.5 (1.7–18.3)	2.2 (1.2–3.9)	1.1 (0.4−3.2)	0.6 (0.3−1.2)
Psychoticism	1.4 (0.8–2.4)	1.2 (0.9–1.8)	1.3 (0.5–3.2)	1.8 (1.1–3.0)	1.4 (0.6−3.2)	1.0 (0.5−1.8)
Old	2.3 (1.2–4.1)	1.8 (1.2–2.7)	0.8 (0.3–2.3)	1.1 (0.7–1.9)	2.6 (1.1−5.9)	1.3 (0.7−2.5)
Rural	1.1 (0.6–1.9)	1.6 (1.1–2.3)	0.4 (0.1–1.3)	1.1 (0.6–1.8)	0.9 (0.4−2.3)	0.9 (0.5−1.7)
Frequent heavy episodic drinking	3.5 (1.2–9.8)	2.9 (1.7–5.0)	5.2 (1.6–17.0)	2.2 (1.2–3.9)	1.1 (0.4−3.1)	0.6 (0.3−1.2)

The results of this study show a statistically significant relationship between poor mental health and risky sexual behavior among university students in southwestern Uganda.

Study IV

The aim of this study was to investigate the effect that the experience of sexual coercion has on sexual behavior. In addition, it sought to determine whether individual, cultural, or social resources can protect individuals from this impact.

Table 7 shows the result of the multivariable logistic regression analyses, performed in order to account for possible confounding regarding the association between the main exposure in this study, experience of sexual coercion, and sexual behaviors. The same potential confounders were used for all four outcomes (sexual behaviors) studied and they were introduced in the same order in two groups, to facilitate the comparisons of the impact of the different factors.

The association between experience of sexual coercion and sexual debut remained significant when adjusting for the basic socio-demographic variables (age, gender, and educational level of head of household) and role of religion and trust in others (OR 1.5, CI: 1.1-2.3).

The association between experience of sexual coercion and early sexual debut and having many sexual partners remained statistically significant after the introduction of the three socio-demographic variables and role of religion and trust in others (OR 2.4, 95% CI: 1.6 –3.7 and OR 1.9, 95% CI: 1.2-3.0). However, when mental health score and alcohol consumption pattern were introduced (data not shown), the association was weakened with 30%, which in this case most likely represents a considerable risk of over-adjustment.

Table 7. The association between (Odds Ratios, 95% Confidence Intervals) experience of sexual coercion and previously had sex, low age of sexual debut, high number of lifetime sexual partners, and inconsistent condom use in a sample of Ugandan university students. Results of multivariate logistic regression analyses.

Sexual behavior	Model 1 (adjusted for age, gender, and educational level of head of household)	Model 2 (adjusted for age, gender, educational level of head of household, role of religion and trust in others)
Previously had sex		
Experience of sexual coercion	1.7 (1.2–2.4)	1.6 (1.1–2.3)
Minor role of religion		1.3 (0.9–1.8)
Low trust in others		0.9 (0.6–1.2)
Low age of sexual debut		

Experience of sexual coercion	2.5 (1.6–3.9)	2.4 (1.5–3.7)
Minor role of religion		1.4 (0.9–2.2)
Low trust in others		1.4 (0.9–2.1)
High number of lifetime sexual partners		
Experience of sexual coercion	1.9 (1.2–3.0)	1.9 (1.2–3.0)
Minor role of religion		1.7 (1.1–2.7)
Low trust in others		1.0 (0.6–1.6)
Inconsistent condom use		
Experience of sexual coercion	1.0 (0.6–1.7)	0.9 (0.5–1.5)
Minor role of religion		0.9 (0.5–1.6)
Low trust in others		2.0 (1.1–3.4)

We also investigated the effect modification by gender regarding the impact of experience of sexual coercion on all the sexual behaviors studied. In summary, the effect of experiencing sexual coercion was not modified by gender for any of the behaviors (data not shown).

In Table 8 we present the results of analyses of interaction between experience of sexual coercion and three selected exposure variables: mental health score, role of religion, and trust in others regarding the risk of having had many sexual partners. We chose to present those separately for the two genders.

When factored in, the mental health score showed a clear tendency of modifying the effect of experience of sexual coercion, so that sexual coercion was only associated with a higher number of sexual partners when the mental health score was low (i.e., among those with poorer mental health). This pattern was strongest among the male students.

The role of religion also seemed to modify the effect of experience of sexual coercion, so that the latter was only associated with a higher number of sexual partners among those who had grown up in families where religion did not play a major role, a pattern that was similar among males and females.

Trust in others tended to modify the effect of experience of sexual coercion in females, so that an increased risk of many sexual partners only was observed among those with a low trust in others. Such a pattern was not found among male students.

Table 8. Analysis of effect modification between mental health, role of religion, and trust in others, on the one hand, and sexual coercion on the other, regarding high number of sexual partners in a sample of Ugandan university students (n = 532), presented as adjusted Odds Ratios with 95% Confidence Intervals (CI).

High number of sexual partners	Female		Male	
	n (%)	Odds Ratios (95% CI)[a]	n (%)	Odds Ratios (95% CI)[a]
Mental health score/Experience of sexual coercion				
High mental health score/No coercion	46 (37.7)	1 (ref)	101 (36.9)	1 (ref)
High mental health score/Coercion	14 (11.5)	0.7 (0.1–3.9)	27 (9.9)	1.1 (0.4–2.5)
Low mental health score/No coercion	29 (23.8)	0.8 (0.2–2.8)	81 (29.6)	1.1 (0.6–1.9)
Low mental health score/Coercion	33 (27.0)	1.7 (0.9–5.9)	65 (23.7)	2.6 (1.4–5.0)
(Missing)	(34)		(102)	
Total	156		376	
Role of religion/Experience of sexual coercion				
Major role of religion/No coercion	47 (37.9)	1 (ref)	102 (36.6)	1 (ref)
Major role of religion/Coercion	29 (23.4)	1.1 (0.3–4.2)	46 (16.5)	1.4 (0.7–2.8)
Minor role of religion/No coercion	30 (24.2)	2.1 (0.6–7.2)	84 (30.1)	1.1 (0.6–2.0)
Minor role of religion/Coercion	18 (14.5)	4.8 (1.3–17.7)	47 (16.8)	2.9 (1.4–6.0)
(Missing)	(32)		(97)	
Total	156		376	
Trust in others/Experience of sexual coercion				
High trust in others/No coercion	53 (45.7)	1 (ref)	112 (43.8)	1 (ref)
High trust in others/Coercion	29 (25.0)	0.7 (0.2–2.5)	41 (16.0)	2.0 (0.96–4.1)
Low trust in others/No coercion	17 (14.7)	0.4 (0.1–2.0)	55 (21.5)	0.9 (0.5–1.7)
Low trust in others/Coercion	17 (14.7)	1.8 (0.5–6.4)	48 (18.8)	2.4 (1.2–4.7)
(Missing)	(40)		(120)	
Total	156		376	

The results of this study showed that the experience of sexual coercion was associated with riskier sexual behavior, among both male and female students in our sample. The association with early sexual debut and having had many sexual partners seemed particularly robust, and remained statistically significant, even when controlled for potential socio-demographic confounders.

Discussion

The results of this study show a statistically significant correlation between religious factors, social capital, poor mental health, experience of sexual coercion, and sexual behavior. However, some of the factors were differently associated with sexual behavior among male and female students, and some of the variables cited seem to modify one another's effect.

The results in this thesis must be interpreted in relation to its target group and setting, which consisted of university students in a certain age group, and should not be generalized for all youth and young adults in Uganda. Moreover, the majority of those in the target group have most likely been brought up in a more protected environment than their peers outside the university.

Generally, admission to a university in Uganda is closely related to completion of a "good" secondary school, which reinforces the observation that the subjects of this study were a selected group of young people in Uganda.

New students at a university in Uganda may be on their own for the first time. They are free from parental supervision and other monitoring they may have encountered at boarding school. For some, experiencing the university environment may be a threat, and for others an opportunity. Young people long to be wanted, accepted, and appreciated; wishing to be loved and giving love in return are existential needs, essential to a person's mental well-being. In a university context this includes the importance of positive interaction with peers, the adoption of social norms, and the feeling of belonging. A college campus offers vast opportunities to test relationships and create networks but those options may differ or be limited, depending on an individual's socio-economic status, self-efficacy, religion, social capital, mental health, and vulnerability to sexual coercion. Young people want to try new things, including experimenting with sex, either voluntarily, or because of expectations from peers (especially true of males). In wanting to please, young people may have difficulty in refusing sexual advances, and providing sexual favors in order to be accepted. Students are confronted with situations like these that require judgment, negotiation, and decision making, often in regard to sexual matters. Those from families in which religion plays a major role might have predetermined values and attitudes on sexuality. However, views on how to approach intimate relations may be challenged by the attitudes and behaviors they encounter in their new environment. In such a context, a female student with high social capital might be better equipped to handle sexual approaches by an older male student. Similarly, male or female students who have experienced sexual coercion might react differently to intimate sexual relations.

In Uganda, sexual relationships are usually initiated by males. Females have a more passive role: they can either say *yes* or *no* to a male's request. Moreover, it is expected in Uganda that males will support their girlfriends financially, pick up the bills

when they go out on dates, and buy them costly presents. It is considered especially prestigious if a female dates a male who owns a car or a house and can provide for her needs. This situation puts considerable pressure on young male students, who in most cases have modest finances and little income. On the one hand, their sexual desires may lead them into relationships with young women that may result in sexual activity. On the other, these male students are unable to cover the financial expenses of their sexual partners. The feeling of inadequacy created under such circumstances may affect the well-being of those males and in some cases even lead to depression. The situation is worsened by competition for the same young women by working-class men who are able to offer them financial support and a more expensive lifestyle. As a result, male students typically drift from one sexual relationship to another, fearful of becoming deeply involved or lacking the resources to commit to any one partner. Thus, some female students prefer dating older, more financially and socially secure working-class males, a phenomenon termed "cross generational sex" in Uganda.

What impact does religion and religious affiliation have on sexual behavior?

In our study, gender seemed to modify the effect of role of religion. If religion played a major role in a student's family, we found an association with previously having had sex among males, but not among females. Gender also seemed to modify the effect of religious affiliation. Protestant affiliation among males was associated with a higher risk for previously having had sex, but the opposite was shown among Protestant female students. In fact, Protestant male students showed a lower probability of having had many lifetime sexual partners in comparison to Catholic males, while the opposite was true of Protestant female students.

Previous research mainly conducted in settings outside Africa has agreed with our findings, concluding that religious engagement is a protective factor for risky sexual behavior [71-76]. Earlier studies have mostly examined the impact of religious affiliation upon sexual behavior in general. Kendler (1997) performed such a study in the US in which she categorized religion in four dimensions: personal devotion (a sense of personal connection to a god), personal conservatism (rigid or literal adherence to the creed of a religious denomination), institutional conservatism (fundamentalist traits in a religious denomination), and participation in a religious community [77]. Later research by Miller and Gur examined the associations between the abovementioned four religious dimensions and sexual behavior [73]. The results indicated that certain aspects of religion (personal devotion, institutional conservatism, and frequent participation) were self-identified with sexual behavior, specifically, a lower number of sexual partners in the previous year. Young women characterized by personal conservatism, however, tended to have a higher number of sexual partners. No association with any of the four religious dimensions was found with regard to the practice of abstinence.

The Protestant Church is one of the largest religious institutions in the western region of Uganda in which Mbarara University is located. This denomination maintains a strong political and social influence on many aspects of public and private life in the country.

The Ugandan president's wife, Janet Museveni, who is a born-again Christian, received funds from the US for Ugandan Youth Forum, a conservative Protestant religious group that promotes abstinence-only to students and young people [78]. Due to the influence of this denomination, religion in Uganda has increasingly become an exclusive "club" in which members follow strict Christian indoctrination. For example, upon entering the university, students at Makerere University in Kampala are invited to join both a Christian Union and a "care group" (a spiritual mentorship team within the same church). They are given cards to sign in which they pledge themselves to "abstinence until marriage" and are encouraged to attend "virginity rallies" [28].

At MUST, networks of conservative Protestant students stage similar networking activities to attract new members during the first few days of each semester. Students who join these groups are obliged to follow certain rules of conduct. Engaging in a sexual relationship, for example, is unacceptable. A network of "care groups" monitors the individuals' behaviors and outcomes of sexual intimacy, like pregnancy may be publicly reprimanded.

The Protestant group at MUST corresponds closely with Kindler's category of "participation in a religious community". Institutional conservatism may also be implied because of the nature of the Protestant Church in Uganda.

Our study, like the one by Miller and Gur, concluded that Protestant female students did not differ from other female students regarding condom use. However, according to our informants, most sexual relationships involving a Protestant female student in Uganda take place in secrecy. Moreover, the cultural context may have a major bearing on the role of religion and sexual behavior. The fear of pregnancy and the resulting exposure of one's clandestine behavior may be the primary reason for a Protestant female students in Uganda who is involved in a sexual relationship to use condoms. The revelation of her sexual activity would most likely subject her to condemnation by both her family and her coreligionists.

The finding that there is a lower risk of Protestant female students having had sexual intercourse in Uganda may be a result of the way Protestant girls are raised in that country. They are subjected to a relatively closed system of institutional choices, receive less exposure to the outside world, and are thus less likely to engage in early sexual behavior. Previous research has described Protestantism as a cultural phenomenon as well as a religious subculture that serves to insulate an individual from secularizing influences [79, 80]. Thus, in our study we found an association between abstinence, on the one hand, and the importance of religion and religious affiliation, on the other.

A recent study showed that Protestants, Pentecostals, and Catholic male youths were more likely to practice abstinence than Muslim men [81] The social settings for acceptable relationships are very complex. Church members in Uganda are expected to seek marriage partners within the same religious affiliation, and even then church leaders need to give their sanction before a marital union is concluded. Prior to marriage, abstinence continues to be the church's dominant expectation. Since premarital sex is associated with immorality and a lack of religious commitment, it may be extremely difficult for a young person to obtain condoms from family members or friends. Moreover, since condoms are only sold over-the-counter in shops or pharmacies in Uganda, and so purchasing them cannot be carried out in secret, a religious young man buying a condom in the marketplace stigmatizes himself. The result is that young people who engage in secret relationships frequently end up having unprotected sex.

In the church's view, premarital sex concerns it personally. A parishioner who becomes pregnant out of wedlock is said to disgrace the church. Thus, the injunction to practice abstinence is not debatable, even for those who plan to marry in the very near future.

Thus the impact of religion and religious affiliation is very strong in Ugandan society, and appears to exert considerable influence on the sexual conduct of young men and women. Nevertheless, the interaction between such factors as social capital, social norms, and the influence of peers also play a role in making the nexus between religion and sexual behavior a complex one. This was illustrated by a report in which students from a Ugandan university described themselves as being in the middle of an emerging clash of sexual ideologies (8). The aforementioned study indicated that not even a fundamentalist religious commitment could rule out sexual activity among young people and found that 11 out of 20 students who belonged to the Pentecostal Church had been involved in sexual relationships. Whether the control mechanism of religion generates behavior modification through apprehension or through conviction is unclear.

Fear of consequences may play a significant role in causing religious affiliation to have a more conservative effect on females than males. The power of decision making in sexual relationships appears to be strongly influenced by a gender imbalance, which in turn is rooted in social culture and property relations. As Uganda is predominately a masculine society in which men also control matters of sex [26], women are less empowered to make independent decisions in this regard. The gender roles in sexual relationships are supported by religious and social mores. Women, therefore, often receive the opprobrium for "inappropriate sexual behavior" despite the fact that they may have been coerced into sexual activities by importunate males.

The role of social capital in regard to sexual behavior

Until recently, there has been little empirical evidence regarding the associations between sexual behavior (in terms of the ABC factors) versus trust in others and bridging trust. In our study, inconsistent condom use among males was significantly associated with low trust in others. This differs from a cross-sectional study carried out among youth in the US, where no associations were found between condom use and social capital [23], as measured by Putnam's Social Capital Index [24]. That study showed a significant positive association among males between low level of social capital, on the one hand, and having had many sexual partners, on the other. This agrees in part with our findings, although we could discover no such association among females. The lack of agreement between the studies may perhaps be explained by differences in the operationalizing social capital. However, it is also possible that the answer lies in contextual differences between the settings.

Trust in others had a varying impact on the likelihood of early sexual debut in males. We can only speculate on the explanation for this. However, the association we found between low trust in others and cautious sexual behavior on the part of females might be accounted for by a higher level of vigilance and the fear of being exploited by males, who are in a stronger position because of gender-determined power relations. Conversely, for males, who have a higher power status than females (especially regarding sexual matters), no rationale for cautious sexual behavior would exist, since a more powerful gender position precludes the risk of being sexually exploited or even exposed to social censure.

The absence of a gender difference in the association between bridging trust and inconsistent condom use might be explained by the "negotiation" situation, whereby the decision as to whether or not to use a condom may be more dependent on such personal characteristics as self-efficacy than to factors related to structural gender power relations.

Non-dominant bridging trust was linked to having had many sexual partners for both male and female students. The difference between general trust in others and bridging trust is that the latter concerns trust in individuals outside the respondent's primary group, as defined by family ties, age, social status, and in some instances religious affiliation. Thus, non-dominant bridging trust could signify a sense of "us and them". This could mean that sexual partners are chosen within the narrow circle of "us", where trust is very high; or, conversely, sought among the "them" category, where behavior unacceptable to one's peer group would be less visible.

The association between low trust in others and low risk for having had sex was especially pronounced in the case of those women who stated that religion played a major role in their family of origin. It differed from the pattern among male students, where the two cited variables acted synergistically. In observing the lack of gender parity, we speculate that wary sexual behavior among females may be a precaution taken in order not to risk sexual exploitation by the dominant gender. Thus, the theory of unequal gender relations may be a possible explanation of our findings.

Female students who declared that religion played a minor role in their family might have been raised in a less traditional environment where gender roles were not so pronounced. In combination with non-dominant bridging trust (the notion of "us and them"), this may have led to less conservative sexual behavior in seeking partners inside and outside of one's own primary group.

The association between low trust in others and a reduced likelihood of having had sex differed for those in whose families religion played a major role, but only among females. In the case of male students, however, having low trust in others and coming from a family in which religion played a major role increased the probability of having had sex.

Associations between mental health and sexual behavior

Several studies from high-income countries show a strong correlation between poor mental health and risky sexual behavior [29-31, 82]. As far as we can determine, there has been no previous research into a potential association between poor mental health and risky sexual behavior among young people in a low-income country in sub-Saharan Africa. Moreover, very few studies in sub-Saharan Africa and Uganda have examined mental disorders among young people and their possible correlates.

In our study, 15% of the males and 16% of the females scored high for probable depression (data not shown). These findings were lower than those in the cross-sectional study carried out in 14 districts spread across Uganda, which reported that 29.3% of all respondents fulfilled the criteria for depression [68]. However, the study cited above measured "probable major depressive disorder" among respondents ages 15 and above in the general population. In another study from the Masaka and Rakai districts in Uganda the prevalence of depression was measured at 24.4%, based on three of the five DSM-IV criteria. The difference in target groups (university students versus general population) might partially explain the difference between the current findings and previous research.

In the present study, high scores for depression were associated with having had sex and having a high number of sexual partners, both for males and females. These results agree with findings from a birth cohort study conducted in New Zealand among 21-year-old females and males, where depression and other mental health factors were associated with a greater likelihood of taking part in risky sexual intercourse, i.e., have a high number of sexual partners [31].

An increased probability of risky sexual behavior in relation to poor mental health (including depression) among young people might be explained by different individual and contextual factors. This is pointed out by Bennett and Bauman, who suggest that "risky sex on one hand may be an expression of anger" that might also be used to "exert some control over one's life". On the other hand, may also function to relieve tension or be affection-seeking behavior, and thus may represent self-

administered treatment for depression [83]. This is corroborated among both males and females by the results of our study. In addition, men with high anxiety and high psychoticism scores also had significantly higher numbers of sexual partners during the last 12 months. This could be in agreement with Bennett and Bauman's suggestion that sexual activity is related to anger, which appears to be a stronger element among men with depression. The finding that a high anxiety score among men is linked to a high number of sexual partners could reflect an overlap of this symptom with depression or, alternatively, serve as a means of relieving tension among those with isolated anxiety syndrome [84, 85]. The higher risk of not using condoms on latest occasions of sexual intercourse among those with high anxiety scores might represent a lower level of negotiation or communication skills in an actual sexual encounter.

In summary, mental health factors seem to play an important role in risky sexual behavior among a university student population in Uganda. Considering that a substantial proportion of that population seems to suffer from mental health issues, this finding should not be neglected in the broader perspective of promoting sexual health. Our study, therefore, indicates that improving mental health for young people might lead to less risky sexual behavior.

Although, as has been cited earlier, young people are singled out for special mention in a draft of the national mental health policy of Uganda [34], a lack of initiative remains with regard to investing in mental health services for this group. A need exists in Uganda for coordinated youth-friendly mental health services, and sexual and reproductive health clinics. It is essential that health workers be made aware of the association between poor mental health and risky sexual behavior.

Does previous experience of sexual coercion influence sexual behavior?

The experience of sexual coercion was higher in our study than in previous research conducted in Uganda [54]. However, direct comparisons are difficult to make because assessment methods, target groups, and time periods vary. In our study, 33.0% of the females and 29.9% of the males had undergone significant experiences of sexual coercion. To the best of our knowledge, this is the first study to assess the prevalence of sexual coercion in a group of young males in Uganda. It has been claimed that such prevalence is considerably lower among males than females in societies with substantial gender inequity [86]. Such a finding is not supported by our data for Uganda, a country where gender equity is conspicuously absent.

Our results indicate that sexual coercion has a very similar impact on the risky sexual behaviors of female and male students, in contrast to previous studies that conclude the impact of sexual coercion differs between males and females [47]. However, our findings do corroborate those findings, that determined the experience of sexual

coercion is associated with early sexual debut and having many sexual partners [45, 55, 58-60]. On the other hand, reports of an association between sexual coercion and inconsistent condom use as, claimed by the studies just cited, could not be confirmed.

Population Attributable Risk (PAR) estimates the proportion of an outcome that would disappear if a specific exposure were eliminated [87]. Some authors have found the PAR for experience of sexual coercion with regard to certain types of sexual behavior to be on the order of 25% (Seto et al., 2010). The implication is that if sexual coercion could be abolished entirely, sexual behaviors associated with the experience of coercion would decrease by 25% in the target population. Using the estimated prevalence of experience of sexual coercion found in our study and the estimated increased risky sexual behavior due to this factor, we arrive at estimates of the PAR regarding experience of sexual coercion in our target population on the order of 20% to 25% for early sexual debut and having many sexual partners. In our view, this demonstrates that there is considerable potential for the prevention of STDs and HIV/AIDS in this setting, provided effective means of intervention are introduced.

Factors that might buffer the impact of sexual coercion on risky sexual behavior (particularly that of having many sexual partners) are of particular interest. Our analyses suggest that such protective elements exist on three levels: the individual (good mental health status), the immediate social context (social capital in terms of high trust in others), and the socio-cultural environment (high religious commitment in the family of origin). Future policy formulations and implementation strategies might benefit by appropriating these insights.

Study Limitations

In Uganda, less than 10% of an age cohort continues on to tertiary education, and it is only the children of the most affluent families do so. For this reason, we believe it may be difficult to generalize the findings of our study to the same age cohorts of the country's general youth population. Nevertheless, since affluent urban dwellers seem to be very much the focus of the new religious movements, including the "born-again" Christians [14], university students in Uganda may well represent a particular strategic group in which the encounter between concepts of social capital and religion and the impact of these factors on sexual behavior may best be understood in general terms.

The study design was cross-sectional, leaving the causal direction open, although it appears more plausible that social capital and mental health would affect sexual behavior than vice-versa. However, sexual coercion could be of two principal types: coercion directed toward a young person by an older individual or an adult (i.e., before the victim becomes a university student), or coercion directed towards a university student by a sexual or dating partner who is a fellow student or another adult

(sometimes considerably older, as in cases of trans-generational sex). Since we lacked information regarding the type of coercion the students in our sample experienced, this circumstance made determining the causal direction problematical. An additional difficulty is presented by the possibility that the outcomes "sexual debut" or "early sexual debut" resulting from sexual coercion may have happened before entry into the university.

As noted, more than 80% of all students enrolled at the university where the study took place completed the questionnaire. The remaining 20% were off campus and could not be contacted. Therefore, the "true" rate of non-responders was less than 20% (and in all probability below 5%). Although we were unable to learn precisely how many students were off-campus, we did know that the student body composition was 66% male and 34% female. The distribution of males and females in the outstanding 20% (n = 240 students) was 72% male (n = 172) and 28% female (n = 68). It, therefore, seems unlikely that systematic factors would have exerted any significant selection bias on the results. Internal missing was on the order of 5% to 10% regarding questions concerning sexual behavior. This might, therefore, lead one to infer a moderate selection bias in an unknown direction, although the likelihood that this would have dramatically biased the risk is low.

Although the general response rate was quite high at 80% of the full target group, non-response regarding the questions assessing experience of sexual coercion was at the level of an additional 20%. One might assume that the proportion of those exposed to sexual coercion was higher among non-responders than among responders, since this could be considered a stigmatizing experience that some individuals would be reluctant to disclose. As socially undesirable behaviors are generally assumed to be underreported in surveys, it is not unlikely that "exposed cases" (i.e., individuals exposed to sexual coercion and subsequently engaging in sexually risky behaviors) are overrepresented among the non-responders. If this is the case, the associations between those phenomena are underestimated in our study.

Regarding the issue of misclassification, it might be argued that there was a risk for dependent misclassification, since the groups with strict moral rules, i.e., those in which religion played a major role, might have habitually underestimated risky sexual behavior due to a "social desirability" factor. In principle, this could have led to an exaggeration of certain associations. However, since the link between religion and behavior did not show a uniform pattern, we do not think misclassification can have had a major influence on the results. Regarding mental health, it might be argued that there also was a risk for dependent misclassification, since individuals who scored low on mental health might have systematically assessed their behavior differently than those scoring high in this regard. If so, it would be very difficult to predict the direction such a dependent misclassification may have been introduced (i.e., it could have led to an under- or over-estimation of risky sexual behavior.) However, since our findings generally agree with those of previous research, we do not think misclassification played a role in our results, although we cannot exclude confounding from sources unrepresented in this study.

Dependent misclassification could also be an issue in cases where individuals who experienced sexual coercion are more prone to report risky sexual behavior than those without such experience, or vice-versa. However, we cannot think of any compelling arguments that would support this assumption. All of our respondents were guaranteed anonymity, and when the outcome of the questionnaire was discussed with student representatives, they were quick to state that their peers had taken this assurance seriously. In their opinion, the results of the questionnaires conveyed a realistic picture of the true circumstances.

Among possible confounders, the most obvious one was age. All final risk estimates were, therefore, controlled for this factor. Since rural origin was also a predictor of sexual behavior, that variable was included as a potential confounder in the multivariate models in study 1, II and III. Furthermore, we controlled for the most plausible confounders in all four studies. However, we cannot exclude confounding from sources unrepresented in this study.

Age was used as a dichotomous variable in the analyses. Supplementary analyses clearly showed that age and sexual debut/number of sexual partners were not related in a linear way as a simple function of chronological time (i.e., age). Rather, there was evidence for both a period and a cohort effect. We, therefore, found it justifiable to group all individuals into two age groups. We also performed all the analyses using a continuous age variable as well, but the results changed only marginally.

Concluding Discussion

The variables selected for this study have been correlated to the ABC strategy. It may, however, be objected that these variables are not based on an entirely objective foundation. Since the concept "risky sexual behavior" is derived from the specific strategies launched in Uganda during the late 1980s and 1990s, they do mirror the underlying value system of the country at a particular point in time. This becomes obvious with regard to the variable that assesses prior sexual experience.

We have attempted to show that individual factors such as mental health and the experience of sexual coercion are related to sexual risky behavior. These elements were strongly associated with the societal processes in Uganda at the time of our study. The mechanisms linking individual factors, such as the experience of sexual coercion or mental health status with sexual behaviors are largely determined by societal circumstances and strongly associated with current societal processes, e.g., the strictness of moral codes and the severity of social and psychological sanctions imposed on anyone who transgressed them. In addition, the prevalence of certain individual factors cited might stem from such sanctions. A good example may be the increasing persecution of homosexuals in Uganda.

The role of social capital is particularly significant in this context. Social capital is often presented as a "generic" concept that has been assumed to have a positive function for individual well-being and health. Surprisingly, the issue of the effect of social capital

profoundly depending on the wider societal context is seldom raised. We hope to have convincingly shown that social capital is a powerful mechanism for mediating societal circumstances on the macro-level, where political and ideological messages are shaped. This is achieved through the reciprocal relationship between participation, the development of shared values and trust (which have the potential of shaping emotions), self-efficacy, and self-image. All of these, in turn, are closely related to various behaviors, including sexual behavior.

It is, therefore, possible that in the particular historical context we have considered social capital might serve as a successful vehicle for halting the HIV/AIDS epidemic in post-conflict Uganda by increasing necessary participation, trust, and openness. In another setting, social capital could be a factor working in the opposite direction by becoming an instrument for the propagation of ideologies of strict moral conduct from a top-down perspective, leading to disempowering individuals, and eventually to increased fear and diminishing openness regarding sexual matters. This would be the inversion of the desirable kind of development outlined by the Nobel laureate Armatya Sen in his seminal work, *Development as Freedom* [88]. The essence of Sen's philosophy is that individual freedom is a central factor for the overall development of a society. If such freedom is equally distributed across a population, the total amount of freedom in such a society will be greater than if a small group monopolizes freedom at the expense of others. This position resembles a human rights perspective, although the moral argument of promoting such rights carries more weight than the more utilitarian approach to the equal distribution of freedom. Infringements on the sexual and reproductive rights of an individual thus become not only a moral issue, but also one linked to the overall sustainable development of a particular society.

The political establishment and religious organizations, which are intertwined in Uganda, have the potential of controlling an individual's sexuality by the exercise of influence and control. Since the situation in Uganda is similar to that of other countries the results presented here have the potential of being interpreted in a wider context.

Through the President's Emergency Plan for AIDS Relief (PEPFAR), the US government has channeled large sums of money to faith-based organizations in Uganda. This money has been used to disseminate "abstinence only" and "anti-condom" messages [89]. The US has subsequently been blamed for the shortage of condoms in Uganda. According to Stephen Lewis, there is no doubt that the condom crises has been exacerbated by the extreme policies that the US is pursuing under PEPFAR [90]. Sam Okware, the senior health ministry official and architect of Uganda's ABC model has stated that PEPFAR succeeded in shifting the emphasis in fighting HIV/AIDS to A and B [Abstinence and Being faithful] just because of the large amounts of money invested in these programs [28].

Conclusion

The results of these studies have shown that religion, social capital, mental health, and sexual coercion appear to be important determinants of sexual behavior among Ugandan university students. Some of these factors were found to be differently associated with sexual behavior among male and female students.

The role of religion and religious affiliation should be viewed against the background of the increasing role of conservative religious injunctions against premarital sex among young people, something that is evident in many countries with a high burden of HIV/AIDS. Such influence of religion must be taken into account in order to gain a deeper understanding of the forces that shape sexual behavior in Uganda. Further research is needed to fully comprehend the mechanisms by which conservative religious beliefs and the social attitudes that result from them inadvertently promote risky sexual behavior.

We found social capital to be associated with less risky sexual behavior. However, gender and the role of religion appeared to modify the effect of social capital. As a result, high social capital was not always related to less risky sexual behavior in a conservative religious context. These findings indicate the importance of understanding the interplay between social capital, religious influence, and gender issues in order to invest resources effectively in HIV/AIDS preventive strategies in Uganda. The results also validate a need for further research regarding the complex relationship between social capital and sexual behavior, and the differing impact these factors may have on young males and females.

Our findings that high scores in assessing poor mental health were associated with risky sexual behavior among university students in Uganda indicate that previous conclusions on the association between sexual behavior and mental health from high- and middle-income countries are also valid in a low-income setting, such as in Uganda. This knowledge has implications for policies, HIV/AIDS preventive strategies and health services.

We hope to have convincingly demonstrated that experience of sexual coercion was associated with risky sexual behavior among both male and female university students in Uganda. Considering that almost one-third of all students who responded to our questionnaire reported having experienced sexual coercion, addressing this issue would appear to be of importance in preventing risky sexual behavior and HIV/AIDS among young people in similar settings. This has implications for policy formulation and implementation regarding the rights of children, as well as university policies for student conduct.

In summary, our findings may support the action of more effective programs to prevent the spread of STIs and HIV/AIDS. We suggest that policy makers would benefit from involving young people in the planning of interventions and in the for-

mulation and implementation of youth-friendly strategies so that such policies may better support the needs of the target group. Young people have social, psychological, and sexual and reproductive health-related concerns, which, if met, will succeed in enrolling them as clients and advocates in the global quest to improve the quality and the availability of universal public healthcare.

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References

1. Sue Napierala Mavedzenge AD, David Ross: *Guidance Brief: HIV Interventions for Most-at Risk Young People*. Geneva: Interagency Task Team on HIV and Young People; 2008.
2. Murphy EM, Greene ME, Mihailovic A, Olupot-Olupot P: **Was the "ABC" approach (abstinence, being faithful, using condoms) responsible for Uganda's decline in HIV?** *PLoS Med* 2006, **3**(9):e379.
3. Cohen S: **Beyond slogans: lessons from Uganda's experience with ABC and HIV/AIDS**. *Reprod Health Matters* 2004, **12**(23):132-135.
4. United_nations_development_programme: *Human Development Report 2005: International cooperation at a crossroads. Aid, trade and security in an unequal world*: Oxford University Press / United Nations Development Programme; 2005.
5. Okware S, Kinsman J, Onyango S, Opio A, Kaggwa P: **Revisiting the ABC strategy: HIV prevention in Uganda in the era of antiretroviral therapy**. *Postgrad Med J* 2005, **81**(960):625-628.
6. Hearst N, Chen S: **Condom promotion for AIDS prevention in the developing world: is it working?** *Stud Fam Plann* 2004, **35**(1):39-47.
7. Shelton JD, Halperin DT, Nantulya V, Potts M, Gayle HD, Holmes KK: **Partner reduction is crucial for balanced "ABC" approach to HIV prevention**. *BMJ* 2004, **328**(7444):891-893.
8. Singh S, Darroch JE, Bankole A: **A, B and C in Uganda: the roles of abstinence, monogamy and condom use in HIV decline**. *Reprod Health Matters* 2004, **12**(23):129-131.
9. Gifford P: **African Christianity. Its public role in Uganda and other African countries**. *Kampala: Fountain Publishers* 1999.
10. Rutenberg N, Watkins SC: **The buzz outside the clinics: conversations and contraception in Nyanza Province, Kenya**. *Stud Fam Plann* 1997, **28**(4):290-307.
11. Sambisa W, Curtis SL, Stokes CS: **Ethnic Differences in Sexual Behaviour among Unmarried Adolescents and Young Adults in Zimbabwe**. *J Biosoc Sci* 2009:1-25.
12. Koffi AK, Kawahara K: **Sexual abstinence behavior among never-married youths in a generalized HIV epidemic country: evidence from the 2005 Cote d'Ivoire AIDS indicator survey**. *BMC Public Health* 2008, **8**:408.
13. Bonke, Adepeju, Omoteso: **A Study of the Sexual Behaviour of University Undergraduate Students in Southwestern Nigeria**. *Soc Sci Med* 2006, **12**(2):129-133.
14. Sadgrove J: **'Keeping Up Appearances': Sex and Religion amongst University Students in Uganda**. *Journal of Religion in Africa* 2007, **37**(1):116-144.

15. 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.

16. Ziersch AM, Baum FE: **Involvement in civil society groups: Is it good for your health?** *J Epidemiol Community Health* 2004, **58**(6):493-500.

17. Putnam R: **Making democracy work. Civic traditions in modern Italy**. *Princeton University Press* 1993.

18. Macinko J, Starfield B: **The utility of social capital in research on health determinants**. *Milbank Q* 2001, **79**(3):387-427, IV.

19. Pronyk PM, Harpham T, Busza J, Phetla G, Morison LA, Hargreaves JR, Kim JC, Watts CH, Porter JD: **Can social capital be intentionally generated? a randomized trial from rural South Africa**. *Soc Sci Med* 2008, **67**(10):1559-1570.

20. Pronyk PM, Kim JC, Abramsky T, Phetla G, Hargreaves JR, Morison LA, Watts C, Busza J, Porter JD: **A combined microfinance and training intervention can reduce HIV risk behaviour in young female participants**. *AIDS* 2008, **22**(13):1659-1665.

21. Erulkar A, Ferede A: **Social exclusion and early or unwanted sexual initiation among poor urban females in Ethiopia**. *Int Perspect Sex Reprod Health* 2009, **35**(4):186-193.

22. Camlin CS, Snow RC: **Parental investment, club membership, and youth sexual risk behavior in Cape Town**. *Health Educ Behav* 2008, **35**(4):522-540.

23. Holtgrave DR, Crosby RA: **Social capital, poverty, and income inequality as predictors of gonorrhoea, syphilis, chlamydia and AIDS case rates in the United States**. *Sex Transm Infect* 2003, **79**(1):62-64.

24. Putnam R: **Comprehensive Social Capital Index**. *available online at wwwbowlingalonecom* 2001.

25. Campbell C, Williams B, Gilgen D: **Is social capital a useful conceptual tool for exploring community level influences on HIV infection? An exploratory case study from South Africa**. *AIDS Care* 2002, **14**(1):41-54.

26. Muriisa R: **The AIDS Panademic in Uganda, Social Capital and the Role of NGOs in Alleviating the Impact of HIV/AIDS**. *VDM Verlag Dr Muller* 2009.

27. Gifford P: **African Christianity. Its public role in Uganda and other African countries.** *Kampala: Fountain Publishers* 1999.

28. Duff O: **Public health and religion: Aids, America, abstinence**. In *The Independent* 2006.

29. Patel V, Flisher AJ, Hetrick S, McGorry P: **Mental health of young people: a global public-health challenge**. *Lancet* 2007, **369**(9569):1302-1313.

30. Shrier LA, Schillinger JA, Aneja P, Rice PA, Batteiger BE, Braslins PG, Orr DP, Fortenberry JD: **Depressive symptoms and sexual risk behavior in young, chlamydia-infected, heterosexual dyads**. *J Adolesc Health* 2009, **45**(1):63-69.

31. Ramrakha S, Caspi A, Dickson N, Moffitt TE, Paul C: **Psychiatric disorders and risky sexual behaviour in young adulthood: cross sectional study in birth cohort**. *BMJ* 2000, **321**(7256):263-266.

32. Patel V: **Mental health in low- and middle-income countries**. *Br Med Bull* 2007, **81-82**:81-96.

33. Ministry of Health U: **Health Sector Strategic Plan ll**. *Ministry of Health, Kampala, Uganda* 2005.

34. Kleintjes S, Lund C, Flisher AJ: **A situational analysis of child and adolescent mental health services in Ghana, Uganda, South Africa and Zambia**. *Afr J Psychiatry (Johannesbg)* 2010, **13**(2):132-139.

35. Shrier LA, Harris SK, Sternberg M, Beardslee WR: **Associations of Depression, Self-Esteem, and Substance Use with Sexual Risk among Adolescents**. *Preventive Medicine* 2001, **33**(3):179-189.

36. Lehrer JA, Shrier LA, Gortmaker S, Buka S: **Depressive symptoms as a longitudinal predictor of sexual risk behaviors among US middle and high school students**. *Pediatrics* 2006, **118**(1):189-200.

37. Smit J, Myer L, Middelkoop K, Seedat S, Wood R, Bekker LG, Stein DJ: **Mental health and sexual risk behaviours in a South African township: a community-based cross-sectional study**. *Public Health* 2006, **120**(6):534-542.

38. Patel V, Flisher AJ, Nikapota A, Malhotra S: **Promoting child and adolescent mental health in low and middle income countries**. *J Child Psychol Psychiatry* 2008, **49**(3):313-334.

39. Saxena S, Paraje G, Sharan P, Karam G, Sadana R: **The 10/90 divide in mental health research: trends over a 10-year period**. *Br J Psychiatry* 2006, **188**:81-82.

40. Manopaiboon C, Kilmarx PH, Limpakarnjanarat K, Jenkins RA, Chaikummao S, Supawitkul S, van Griensven F: **Sexual coercion among adolescents in northern Thailand: prevalence and associated factors**. *Southeast Asian J Trop Med Public Health* 2003, **34**(2):447-457.

41. de Visser R, Smith A, CE R, Richters J, AE. G: **Sex in Australia: experiences of sexual coercion among a representative sample of adults**. *Aust N Z J Public Health* 2003, **27**(2):198-203.

42. Erulkar AS: **The experience of sexual coercion among young people in Kenya**. *Int Fam Plan Perspect* 2004, **30**(4):182-189.

43. Ajuwon AJ, Olaleye A, Faromoju B, Ladipo O: **Sexual behavior and experience of sexual coercion among secondary school students in three states in North Eastern Nigeria**. *BMC Public Health* 2006, **6**:310.

44. de Moraes CL, Cabral CS, Heilborn ML: **[Magnitude and characterization of sexual coercion experienced by young adults in three Brazilian state capitals: Porto Alegre, Rio de Janeiro, and Salvador]**. *Cad Saude Publica* 2006, **22**(7):1493-1504.

45. Biglan A, Noell J, Ochs L, Smolkowski K, Metzler C: **Does sexual coercion play a role in the high-risk sexual behavior of adolescent and young adult women?** *J Behav Med* 1995, **18**(6):549-568.

46. Kalichman SC, Williams EA, Cherry C, Belcher L, Nachimson D: **Sexual coercion, domestic violence, and negotiating condom use among low-income African American women**. *J Womens Health* 1998, **7**(3):371-378.

47. Cáceres. C, Vanoss. MB, Sid. HE: **Sexual coercion among youth and young adults in Lima, Peru**. *J Adolesc Health* 2000, **26**(5):361-367.

48. Jewkes R, Abrahams N: **The epidemiology of rape and sexual coercion in South Africa: an overview**. *Soc Sci Med* 2002, **55**(7):1231-1244.

49. Ajuwon AJ, Olley BO, Akin-Jimoh I, Akintola O: **Experience of sexual coercion among adolescents in Ibadan, Nigeria**. *Afr J Reprod Health* 2001, **5**(3):120-131.

50. Nasta A, Shah B, Brahmanandam S, Richman K, Wittels K, Allsworth J, Boardman L: **Sexual victimization: incidence, knowledge and resource use among a population of college women**. *J Pediatr Adolesc Gynecol* 2005, **18**(2):91-96.

51. Maharaj P, Munthree C: **Coerced first sexual intercourse and selected reproductive health outcomes among young women in KwaZulu-Natal, South Africa**. *J Biosoc Sci* 2007, **39**(2):231-244.

52. Baumgartner JN, Waszak Geary C, Tucker H, Wedderburn M: **The influence of early sexual debut and sexual violence on adolescent pregnancy: a matched case-control study in Jamaica**. *Int Perspect Sex Reprod Health* 2009, **35**(1):21-28.

53. van der Straten A, King R, Grinstead O, Serufilira A, Allen S: **Couple communication, sexual coercion and HIV risk reduction in Kigali, Rwanda**. *AIDS* 1995, **9**(8):935-944.

54. Moore AM, Biddlecom AE, Zulu EM: **Prevalence and meanings of exchange of money or gifts for sex in unmarried adolescent sexual relationships in sub-Saharan Africa**. *Afr J Reprod Health* 2007, **11**(3):44-61.

55. Garoma S, Belachew T, Wondafrash M: **Sexual coercion and reproductive health outcomes among young females of Nekemte Town, South West Ethiopia**. *Ethiop Med J* 2008, **46**(1):19-28.

56. Polis CB, Lutalo T, Wawer M, Serwadda D, Kigozi G, Nalugoda F, Kiwanuka N, Gray R: **Coerced sexual debut and lifetime abortion attempts among women in Rakai, Uganda**. *Int J Gynaecol Obstet* 2009, **104**(2):105-109.

57. Koenig MA, Lutalo T, Zhao F, Nalugoda F, Kiwanuka N, Wabwire-Mangen F, Kigozi G, Sewankambo N, Wagman J, Serwadda D *et al*: **Coercive sex in**

rural Uganda: prevalence and associated risk factors. *Soc Sci Med* 2004, **58**(4):787-798.

58. Koenig MA, Zablotska I, Lutalo T, Nalugoda F, Wagman J, Gray R: **Coerced first intercourse and reproductive health among adolescent women in Rakai, Uganda**. *Int Fam Plan Perspect* 2004, **30**(4):156-163.
59. George C, Alary M, Otis J: **Correlates of sexual activity and inconsistent condom use among high-school girls in Dominica**. *West Indian Med J* 2007, **56**(5):433-438.
60. Hovsepian SL, Blais M, Manseau H, Otis J, Girard ME: **Prior victimization and sexual and contraceptive self-efficacy among adolescent females under Child Protective Services care**. *Health Educ Behav* 2010, **37**(1):65-83.
61. Dahlgren G, Whitehead M: **Policies and strategies to promote social equity in health. Background document to WHO - Strategy paper for Europe**. Institute for Futures Studies; 2007.
62. 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.
63. Derogatis LR, Lipman RS, Covi L: **SCL-90: an outpatient psychiatric rating scale--preliminary report**. *Psychopharmacol Bull* 1973, **9**(1):13-28.
64. 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.
65. Kaaya SF, Fawzi MC, Mbwambo JK, Lee B, Msamanga GI, Fawzi W: **Validity of the Hopkins Symptom Checklist-25 amongst HIV-positive pregnant women in Tanzania**. *Acta Psychiatr Scand* 2002, **106**(1):9-19.
66. 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.
67. Bolton P: **Cross-Cultural Assessment Of Trauma-Related Mental Illness**. *USAID* 2000.
68. Kinyanda E, Woodburn P, Tugumisirize J, Kagugube J, Ndyanabangi S, Patel V: **Poverty, life events and the risk for depression in Uganda**. *Soc Psychiatry Psychiatr Epidemiol* 2009.
69. Hanson BS, Ostergren PO, Elmstahl S, Isacsson SO, Ranstam J: **Reliability and validity assessments of measures of social networks, social support and control--results from the Malmo Shoulder and Neck Study**. *Scand J Soc Med* 1997, **25(4)**:249-257.
70. Rothman KJ, Greenland S, Lash TL: *Modern epidemiology*. 3. edition. Philadelphia: Lippincott Williams & Wilkins; 2008.
71. Shirazi KK, Morowatisharifabad MA: **Religiosity and determinants of safe sex in Iranian non-medical male students**. *J Relig Health* 2009, **48**(1):29-36.

72. McCree DH, Wingood GM, DiClemente R, Davies S, Harrington KF: **Religiosity and risky sexual behavior in African-American adolescent females**. *J Adolesc Health* 2003, **33**(1):2-8.

73. Miller L, Gur M: **Religiousness and sexual responsibility in adolescent girls**. *J Adolesc Health* 2002, **31**(5):401-406.

74. Poulson RL, Eppler MA, Satterwhite TN, Wuensch KL, Bass LA: **Alcohol consumption, strength of religious beliefs, and risky sexual behavior in college students**. *J Am Coll Health* 1998, **46**(5):227-232.

75. 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.

76. Lammers C, Ireland M, Resnick M, Blum R: **Influences on adolescents' decision to postpone onset of sexual intercourse: a survival analysis of virginity among youths aged 13 to 18 years**. *J Adolesc Health* 2000, **26**(1):42-48.

77. Kendler KS, Gardner CO, Prescott CA: **Religion, psychopathology, and substance use and abuse; a multimeasure, genetic-epidemiologic study**. *Am J Psychiatry* 1997, **154**(3):322-329.

78. Brown D: **Group Awarded AIDS Grant Despite Negative Appraisal**. In *The Washington Post*. Washington: Weymouth, K.; 2005:17.

79. Schmalzbauer J: **Evangelicals in the New Class: Class versus Subcultural Predictors of Ideology.** *Journal for the Scientific Study of Religion 32:330-42* 1993.

80. Petersen LR DG: **Secularization and the influence of religion on beliefs about premarital sex**. *Soc Forces* 1997, **75**: 1071–1089.

81. Trinitapoli J: **Religious teachings and influences on the ABCs of HIV prevention in Malawi**. *Soc Sci Med* 2009, **69**(2):199-209.

82. Shrier LA, Harris SK, Beardslee WR: **Temporal associations between depressive symptoms and self-reported sexually transmitted disease among adolescents**. *Arch Pediatr Adolesc Med* 2002, **156**(6):599-606.

83. Bennett DL, Bauman A: **Adolescent mental health and risky sexual behaviour. Young people need health care that covers psychological, sexual, and social areas**. *BMJ* 2000, **321**(7256):251-252.

84. Brody S: **Blood pressure reactivity to stress is better for people who recently had penile-vaginal intercourse than for people who had other or no sexual activity**. *Biol Psychol* 2006, **71**(2):214-222.

85. Burleson MH, Trevathan WR, Todd M: **In the mood for love or vice versa? Exploring the relations among sexual activity, physical affection, affect, and stress in the daily lives of mid-aged women**. *Arch Sex Behav* 2007, **36**(3):357-368.

86. Hines DA: **Predictors of sexual coercion against women and men: a mul-**

tilevel, multinational study of university students. *Arch Sex Behav* 2007, **36**(3):403-422.

87. Afifi TO, Enns MW, Cox BJ, Asmundson GJ, Stein MB, Sareen J: **Population attributable fractions of psychiatric disorders and suicide ideation and attempts associated with adverse childhood experiences**. *Am J Public Health* 2008, **98**(5):946-952.
88. Sen A: *Development as freedom*. 1st. edition. New York: Knopf; 1999.
89. Epstein H: **God and Fight Against AIDS**. In *New York Review of Books*. New York: Rea S. Hederman; 2005.
90. Altman LK: **U.S. Blamed for Condom Shortage in Fighting AIDS in Uganda**. New York: The New York Times; 2005.
91. Westen JH: **Condom Battle of the First Ladies – Laura Bush vs Uganda's Janet Museveni**. Life Site News; 2007.