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ORIGINAL PAPER

# Risk-Taking Behaviors and Sexual Violence Among Secondary School Students in Tanzania

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## Abstract

There is limited district level data on drug or alcohol use as well as sex and reproductive history among secondary school students in Tanzania to inform prevention efforts. To address this, we conducted a survey of 2523 secondary school students in 2 districts (Bahi and Mpwapwa) and the Dodoma municipal area in Tanzania. Overall, fifty three percent were female and 67% were between the ages of 15 and 17 years old. Students in the Dodoma Municipality district self-reported the highest prevalence of forced sex, sex for gifts or money, and drug use. Students in the Bahi district reported the highest prevalence of alcohol use. Males reported a higher prevalence of consensual sex, contraception use, and alcohol and drug use compared to females, the latter of whom reported a higher prevalence of forced sex. Most students' indicated that their primary source of sex and reproductive health information was their teachers. These results suggest the need for tailored interventions among secondary school students in the Dodoma region in Tanzania.

**Keywords** Adolescent health · Risk-taking behaviors · Sexual health · Students · Tanzania

## Introduction

Adolescents and young adults in Sub-Saharan Africa are at an increased risk of sexual violence, sexually transmitted infections (STIs), and pregnancy [1, 2]. Sexual violence can result in sexually transmitted infections and pregnancy [3]. STIs can cause serious health effects including adverse birth outcomes and infertility, as well as place an economic strain on adolescents because of both treatment costs and loss of productivity [1, 4, 5]. Recent studies report that adolescent girls are at a higher risk of STIs than their young adult counterparts [6, 7]. According to the World Health Organization (WHO), risk-taking behaviors leading to HIV infection and STIs include multiple partners, early sexual debut, condom use habits and exchanging sex for gifts or money, as well as alcohol and drug use [8].

In sub-Saharan Africa, adolescents and young adults aged 15–25 years have an estimated HIV prevalence of 1.5% for males and 4.3% for females [9]. Recently, the prevalence of HIV in people aged 15 to 39 in Tanzania was estimated to be 4.7% [10]. Past studies have identified several factors that are associated with the presence of STIs and self-reported unsafe sexual behaviors. One such study indicated that adolescent boys report being subject to peer pressure to have sex as well as social norms dissuading condom use as factors that promote unsafe sexual behaviors [11]. Younger age at first sexual debut, increasing age difference between partners, and sexual violence have also been linked to STI presence in pregnant adolescent girls [7, 12]. Another study found that nearly a third of surveyed adolescents were sexually active, with more males reporting sexual activity than females [13].

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Previous programs to reduce HIV and STI infections in sub-Saharan Africa have had mixed results [14]. One intervention was effective at increasing participants' sexual health knowledge, but did not change behaviors of the study participants [15]. However, these programs only addressed sexual risk factors without consideration of additional risk factors such as alcohol or drug use which tend to occur in tandem [1, 16, 17]. Of note, alcohol use has been recognized as a serious problem among young Tanzanians [17–19]. A national school-based survey conducted in 2014 noted that among those who reported alcohol use, > 90% indicated that they started drinking before the age of 14 years old [20]. In terms of drug use (defined as using drugs for anything other than medical purposes) a study conducted in Dodoma Municipality, Tanzania among secondary school students found that 8.5% of students admitted to using drugs and 25.5% reported that they had friends who used drugs [21].

The latter finding regarding drugs or alcohol is particularly noteworthy given the fact that over half of the Tanzanian population is 18 years old or younger [22, 23] and that the Tanzanian government officially relocated to Dodoma from Dar es Salaam in 2018 [24]. Due to the large influx and growth of the population that is expected to occur in the coming years as a result of this move, an understanding of the current burden of STIs, alcohol and drug use in adolescents in this district, and whether there are district level differences between Dodoma and the surrounding regions will provide important baseline data to determine whether there is a need for tailored prevention activities. The aim of this study is to compare the prevalence of risk-taking behaviors and as well as the sex and reproductive history in secondary students from three districts in Dodoma, Tanzania.

## Materials and Methods

A 63-question survey was developed based on a review of the literature. The survey was originally developed in English and subsequently translated into Swahili. Demographic questions included gender, age, and religion. Sex behavior and reproductive health questions included ever having consensual sex, forced sex, sex for gifts or money, contraception use, diagnosis of an STI, where students receive information regarding sex and reproductive health and barriers to using contraception or receiving help for sex or reproductive health issues. Additional questions assessed use of alcohol and drugs. A section of the survey was developed for females only and included questions regarding pregnancies. For this study, a waiver of parental consent was approved by the IRB given the sensitive nature of the topics included in the survey and the fact that the survey was anonymous and voluntary.

The survey was initially piloted with a group of 16 secondary students who were recruited from a secondary school in Dodoma Municipality. The students were asked to review the survey questions for comprehension and completeness as well as to provide comments or suggestions regarding optimal methods for data collection in this population. The survey was then finalized for the main study, which was conducted in the summer of 2016. Participants were recruited from four randomly selected secondary schools in Dodoma Municipality, Bahi, and Mpwapwa Districts—a total of twelve schools. These districts were chosen as they represented a mixture of urban and rural populations in the Dodoma Region.

Secondary school students enrolled in Forms I, II, III, or IV (equivalent to Grades 9 through 12 in the United States) were eligible to be surveyed. Students were informed that the survey was voluntary and anonymous: no identifying information was collected. After students provided informed consent to participate, they were provided with paper copies of the survey to complete.

All analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC). Analyses were done for the total sample as well as stratified by district, gender, and location. Location was defined as either 'urban' or 'rural', per the classification of the Ministry of Education. The prevalence of each self-reported behavior was estimated as proportions. Modified Poisson Regression was performed to determine significant differences between districts, by gender, or urban/rural location [25]. Unadjusted and adjusted prevalence ratios were calculated. Students who did not report their sex or age were excluded from analysis. Reponses from male students to questions for females only were also excluded. Students who indicated they did not know what an STI were excluded from STI related analyses. The study was approved by the National Institute of Medical Research in Dar es Salaam, Tanzania and the University of Minnesota Institutional Review Board.

## Results

A total of 2523 secondary students from 12 schools in 3 districts consented to be surveyed in July 2016. Only students who reported their age and sex were included for analysis (N = 2482). Characteristics of the students are presented in Table 1. Fifty three percent of students were female, 82.1% Christian, 54.8% lived in rural areas. The age of the students ranged from 12 to 22 years old, with a median age of 16.

### Overall Prevalence of General Health and Risk-Taking Behaviors

Tables 2 and 3 present the prevalence of health factors and behaviors for the total sample and stratified by district, gender and rural/urban status. In the total sample, ever engaging

**Table 1** Demographic characteristics of the overall study sample

| | Total | % | Female | % | Male | % |
|---|---|---|---|---|---|---|
| N | 2522 | | 1346 | 53.37 | 1170 | 46.39 |
| Gender | | | | | | |
| Female | 1346 | (53.37) | 1346 | (100.00) | – | – |
| Male | 1170 | (46.39) | – | – | 1171 | (100.00) |
| Missing | 6 | (0.24) | – | – | – | – |
| Age | | | | | | |
| (12–14) | 338 | (13.40) | 221 | (16.42) | 117 | (10.00) |
| (15–17) | 1695 | (67.21) | 947 | (70.36) | 744 | (63.59) |
| (18 +) | 453 | (17.96) | 167 | (12.41) | 285 | (24.36) |
| Missing | 36 | (1.43) | 11 | (0.82) | 24 | (2.05) |
| Religion | | | | | | |
| Christianity | 2071 | (82.12) | 1109 | (82.39) | 958 | (81.88) |
| Islam | 428 | (16.97) | 233 | (17.31) | 194 | (16.58) |
| Hindu | 6 | (0.24) | 1 | (0.07) | 5 | (0.43) |
| Other | 8 | (0.32) | 0 | (0.00) | 8 | (0.68) |
| Missing | 9 | (0.36) | 3 | (0.22) | 5 | (0.43) |
| District | | | | | | |
| Dodoma | 886 | (35.13) | 461 | (34.25) | 424 | (36.24) |
| Bahi | 552 | (21.89) | 307 | (22.81) | 242 | (20.68) |
| Mpwapwa | 1084 | (42.98) | 578 | (42.94) | 504 | (43.08) |
| Location | | | | | | |
| Urban | 1139 | (45.16) | 593 | (44.06) | 554 | (47.35) |
| Rural | 1383 | (54.84) | 753 | (55.94) | 626 | (53.50) |

in consensual sex was reported by 30.2% of students; 16.5% reported ever having forced sex, and 7.2% reported ever having sex for gifts or money. Among students who indicated they were sexually active, 47.0% indicated use of contraception. Regarding risk-taking behaviors, 19.8% of students reported ever drinking alcohol, 7.4% ever smoking cigarettes, and 3.3% reported ever using marijuana. Additionally, 1.4% of girls reported they had been pregnant.

## District, Gender and Rural–Urban Differences in General Health Indicators and Risk-Taking Behaviors

Students from Bahi District reported significantly lower prevalence of risk-taking behaviors compared to those from the Dodoma Municipality. The prevalence of forced sex was 0.53 [95% confidence interval (CI) 0.40, 0.71]; sex for gifts or money was 0.60 (0.38, 0.94); and the prevalence of ever smoking cigarettes was 0.63 (0.43, 0.91) times the prevalence of that reported by Dodoma students. Bahi students also reported half the prevalence of ever using marijuana compared to students from Dodoma. Of note, the prevalence of ever drinking alcohol in Bahi District was significantly higher 1.32 (1.09, 1.60) compared to that reported by students from the Dodoma Municipality. Other factors were not significantly different between these two districts.

Similarly, students from Mpwapwa District reported a significantly lower prevalence of multiple risk-taking behaviors compared to students from the Dodoma. Among Mpwapwa District students, ever drinking alcohol was significantly lower (0.79; 95% CI 0.66, 0.96). The prevalence of having smoked cigarettes (0.50; 0.36, 0.69) or using marijuana (0.43; 0.26, 0.72) was also lower than that reported by students in the Dodoma Municipality. The prevalence of forced sex was also significantly lower (0.78; 0.64, 0.95) compared to that reported by students from Dodoma Municipality. No other factors were significantly different.

Key differences existed between Mpwapwa and Bahi Districts as well. Mpwapwa students reported a significantly higher prevalence of forced sex (1.47; 1.10, 1.98) and sex for gifts or money (1.64; 1.05, 2.56) compared to students from Bahi. However, in contrast, students from Mpwapwa reported a significantly lower (0.60; 0.49, 0.73) prevalence of ever drinking alcohol.

Male students reported almost twice the prevalence (1.95; 1.70, 2.23) of ever engaging in consensual sex, a higher prevalence of contraception use (1.35; 1.15, 1.57), and significantly more drug and alcohol use than females. In contrast, males reported a much lower prevalence (0.70; 0.58, 0.86) of forced sex than female students.

Students from schools in urban areas reported almost double the prevalence of forced sex and cigarette smoking

**Table 2** Reported prevalence of sex behaviors, STIs and pregnancy

| | Consensual sex | | Forced sex | | Sex for gifts or money | | STI diagnosis[a] | | Use contraception[b] | | Pregnancy | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (*N* = 2332) | | (*N* = 2286) | | (*N* = 2231) | | (*N* = 2052) | | (*N* = 871) | | (*N* = 1269) | |
| | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value |
| Overall | 30.2% (705) | | 16.5% (376) | | 7.2% (160) | | 1.9% (38) | | 47.0% (409) | | 1.4% (18) | |
| Dodoma | 30.3% (250) | 0.939 | 20.2% (167) | < 0.0001 | 7.7% (62) | 0.164 | 1.3% (10) | 0.332 | 46.0% (154) | 0.824 | 1.4% (6) | 0.398 |
| Mpwapwa | 29.9% (302) | | 15.9% (156) | | 7.7% (74) | | 2.0% (17) | | 46.9% (169) | | 1.9% (10) | |
| Bahi | 30.8% (153) | | 11.1% (53) | | 5.2% (24) | | 2.5% (11) | | 48.9% (86) | | 0.7% (2) | |
| Female | 19.4% (242) | < 0.0001 | 18.6% (229) | 0.003 | 7.2% (86) | 0.999 | 1.5% (16) | 0.196 | 38.7% (144) | < 0.0001 | – | |
| Male | 42.7% (463) | | 13.9% (147) | | 7.2% (74) | | 2.3% (22) | | 53.1% (265) | | – | |
| Urban | 28.8% (304) | 0.167 | 21.7% (231) | < 0.0001 | 7.7% (78) | 0.412 | 1.4% (14) | 0.145 | 42.7% (178) | 0.016 | 2.2% (12) | 0.047 |
| Rural | 31.4% (401) | | 11.9% (145) | | 6.8% (82) | | 2.3% (24) | | 50.9% (231) | | 0.8% (6) | |

[a]Only included individuals who indicated they knew what an STI was

[b]Only included individuals who indicated they are sexually active (consensual sex, forced sex, or sex for gifts or money)

**Table 3** Reported prevalence of alcohol, tobacco and drugs use

| | Alcohol use | | Chewing tobacco use | | Cigarette use | | Marijuana use | | Cocaine use | | Inhalants or sniffing drugs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *N* = 2485 | | *N* = 2463 | | *N* = 2474 | | *N* = 2425 | | *N* = 2441 | | *N* = 2448 | |
| | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value | Prevalence (n) | p-value |
| Overall | 19.8% (485) | | 1.6% (39) | | 7.4% (180) | | 3.3% (78) | | 0.8% (20) | | 2.1% (50) | |
| Dodoma | 19.8% (171) | < 0.0001 | 2.1% (18) | 0.310 | 10.3% (88) | 0.0001 | 4.9% (41) | 0.004 | 0.7% (6) | 0.874 | 1.8% (15) | 0.46 |
| Mpwapwa | 15.7% (166) | | 1.2% (13) | | 5.1% (54) | | 2.1% (22) | | 0.9% (9) | | 2.5% (26) | |
| Bahi | 28.0% (148) | | 1.5% (8) | | 7.2% (38) | | 2.9% (15) | | 1.0% (5) | | 1.7% (9) | |
| Female | 13.9% (183) | < 0.0001 | 0.6% (8) | < 0.0001 | 1.8% (24) | < 0.0001 | 0.9% (11) | < 0.0001 | 0.7% (9) | 0.404 | 0.6% (8) | < 0.0001 |
| Male | 26.6% (302) | | 2.78% (31) | | 13.9% (156) | | 6.1% (67) | | 1.0% (11) | | 3.8% (42) | |
| Urban | 19.6% (219) | 0.861 | 1.6% (18) | 0.916 | 10.0% (110) | < 0.0001 | 4.7% (51) | 0.0003 | 0.9% (10) | 0.665 | 2.7% (29) | 0.070 |
| Rural | 19.9% (266) | | 1.6% (21) | | 5.24% (70) | | 2.1% (27) | | 0.8% (10) | | 1.6% (21) | |

and almost 3 times the prevalence of marijuana use compared to those from rural areas. Of note, female students indicated a 3.19 (1.14, 8.95) times higher prevalence of ever having been pregnant than students from schools in rural areas.

In multivariate analyses, being male, ever having consensual sex, and ever having sex for gifts or money were significantly associated with higher contraception use. Attending school in an urban area, ever having sex for gifts or money, being female or ever having drunk alcohol were significantly associated with a higher prevalence of reported forced sex. Being female, ever having consensual sex, ever being forced to have sex, ever having drunk alcohol, and ever having used contraception were also significantly associated with reporting ever having sex for gifts or money.

### Sources of Information

The majority (> 95%) of students responded to the questions regarding sources of information for puberty, pregnancy, and romantic relationships (refer to Table 4). Most students indicated their primary source of information regarding puberty were either teachers (42.7%) or parents (22.7%). Teachers (44.1%) and health care providers (20.4%) were the main sources of information regarding pregnancy. Students indicated their primary source of information regarding romantic relationships was much more varied and included friends and the media.

## Discussion

In our study of over 2000 students from three regions in the Dodoma area of Tanzania, we found that approximately 30% of the students surveyed reported being sexually active. While these results are generally similar to other studies, including estimates from the Demographic Health Survey (DHS), the results for females in particular in our study are of concern. According to the DHS, approximately 13.4% of adolescents and women aged 15–24 years in Dodoma reported sexual violence, which is lower than the prevalence of forced sex reported by the female secondary students in this study (18.6%) [23]. Of note, male secondary students reported a higher prevalence of ever having been forced to have sex (13.9%) in this survey, than female respondents in DHS. The DHS term "sexual violence" may be considered a broader term than the term "forced sex" that was used in this survey, since sexual violence captures unwanted sexual experiences with or without contact [26]. As such, our finding suggest that rape or coercive sexual acts may be occurring in a higher proportion of both male and female adolescents in Dodoma Region than previously recognized. In addition, students from urban areas and female students reported a significantly higher prevalence of forced sex than students from other districts, rural areas, or males.

Male students reported significantly higher contraception use than females in this study. The DHS only reported contraception use for married women, but indicates that at least 22% of women have an unmet need for family planning and contraception [27]. The disparity in contraception use between genders may highlight a lack of choice for female adolescents, along with a stigma attached to purchasing contraceptives, or insisting on their use during sex [3]. Approximately 1.4% of female students reported ever having been pregnant in this study. This finding stands in stark contrast to the findings from the DHS which showed that, 27% of female Tanzanians aged 15 to 19 years have given birth or are pregnant. However, in the DHS, adolescent pregnancy was less likely to be reported by urban, wealthy, and educated women [23]. Thus, the lower pregnancy prevalence in our study compared to that found in the DHS may be explained by the disproportionately large proportion (84%) of students from urban areas in our study as well as the fact that national policies prevent girls who are pregnant from

**Table 4** Primary source of sexual and reproductive health information for puberty, pregnancy, and romantic relationships

| | Information regarding puberty | | | Information regarding pregnancy | | | Information regarding relationships | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Female | Male | Total | Female | Male | Total | Female | Male |
| Magazines | 2.8% (70) | 2.7% (36) | 2.9% (34) | 3.4% (85) | 3.5% (47) | 3.3% (38) | 7.6% (188) | 7.8% (103) | 7.4% (84) |
| Media | 8% (199) | 5.2% (70) | 11.1% (129) | 10.8% (269) | 9.6% (128) | 12.2% (140) | 16.5% (407) | 14.0% (185) | 19.5% (222) |
| Parents | 22.7% (567) | 35% (468) | 8.4% (97) | 10.2% (254) | 16% (213) | 3.6% (41) | 19.4% (479) | 25.2% (332) | 12.8% (146) |
| Siblings | 3% (75) | 3.3% (44) | 2.7% (31) | 1.6% (40) | 1.6% (21) | 1.6% (19) | 3.4% (83) | 4.2% (55) | 2.5% (28) |
| Teachers | 42.7% (1068) | 36.1% (484) | 50.3% (582) | 44.1% (1097) | 40.1% (533) | 48.7% (561) | 21.9% (539) | 20.4% (269) | 23.7% (270) |
| Health care providers | 9.1% (228) | 7.5% (100) | 11.1% (128) | 20.4% (506) | 19.7% (262) | 21.1% (243) | 6.7% (164) | 6.2% (82) | 7.2% (82) |
| Friends | 10.5% (262) | 9% (121) | 12.1% (140) | 8.2% (204) | 8.1% (107) | 8.4% (97) | 23.8% (587) | 21.5% (283) | 26.4% (301) |
| Other | 1.3% (33) | 1.2% (16) | 1.5% (17) | 1.2% (31) | 1.4% (18) | 1.1% (13) | 0.7% (17) | 0.8% (10) | 0.6% (7) |
| Total | 2502 | 1339 | 1158 | 2486 | 1329 | 1152 | 2464 | 1319 | 1140 |

attending school. The lack of contraceptive options reported by girls coupled with current policies for preventing girls who become pregnant from attending school underscore the urgent need to identify acceptable methods for preventing pregnancy in this sexually active group of students. Importantly, increasing access to contraception and education on the benefits of and how to negotiate contraception use may prove useful in increasing contraception use in adolescents to prevent early pregnancies and disease transmission [28]. The prevalence of alcohol use in our study was lower than that in previous studies [16, 18, 19, 21]. The prevalence of drug use for all drugs was also lower than that reported in previous studies [16, 21]. Males reported more alcohol and drug use compared to females, with the exception of cocaine, a finding similar to other studies. Masibo et al. [21] was the only study to also investigate specific drug use in Dodoma. In that study, when asking students about using psychoactive substances, respondents were much more likely to indicate they had a friend who used drugs or alcohol than to indicate they used drugs or alcohol themselves. This may help explain why many students refused to answer these questions as well as the lower prevalence estimates of alcohol and drug use in our study.

Students reported primarily receiving information regarding puberty and pregnancy from teachers, while teachers, friends, parents, and the media were all similarly indicated as primary sources of information regarding relationships. Another study found that mass media was the most common source of information regarding reproductive health information, but acknowledged that this information comes from a variety of sources [29]. Additionally, as this study population was exclusively students, there may have been an over-reporting of teachers as a primary source of information. However, as teachers are a primary source of information regarding puberty, pregnancy, and relationships, teachers could be used to implement interventions and education in these areas.

### Limitations

Limitations of our study include the fact that per the DHS, 84% of the population of Dodoma live in rural areas, whereas among students surveyed in this study, 55% live in rural areas which suggests that our study's student population may over-represent similarly aged individuals in urban areas [23]. Additionally, according to the 2012 census, approximately 14% of Dodoma residents reported ever attending secondary school. Since our study only included secondary school students, our findings may not be generalizable to adolescents who are similarly aged but do not attend school. At least one study has shown that this may be the case: out-of-school adolescents were more sexually active, had more sexual partners, and were more likely to use condoms than those in school [13]. This suggests that the findings in our study may be an underestimate of risk-taking and sex behavior in adolescents in the area. Determining optimal methods for reaching out-of-school adolescents will be important for designing interventions that can have maximal impact in the area.

This study was cross-sectional, and thus trends and temporality cannot be obtained from the data. Additionally, the data was self-reported, and social desirability bias may limit the accuracy of the data. For example, students may not want to accurately report their risky behavior or sexual histories and students who engage in risk-taking behaviors may be less likely to have consented to the survey. However, to minimize this concern, the survey was anonymous and students were separated by age during survey administration.

## Conclusions

In conclusion, our study highlights some unique findings that warrant further study, in particular the high prevalence of self-reported forced sex for both genders. Multivariate analyses showed that attending an urban school and being female was associated with an increased history of forced sex. This group may benefit from focused interventions and health programs. Additionally, the lower prevalence of contraception use in female students compared to males is another key area for prioritization. Both lowering sexual violence experienced by adolescents and improving contraception rates, especially among females, could have a significant impact on long-term health for adolescents and should be a priority for future health interventions. Of note, the district-specific results reported here can be used to tailor future interventions. Finally, given that teachers and parents are a common source of information regarding reproductive and sexual health, interventions should consider family-level as well as school level approaches.

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**Authors Contributions** TD, MK, SK and CM conceived the study. TD, DC, RM performed the data collection. TD drafted the manuscript. All authors read and/or provided revisions and gave approval for final version of the manuscript to be published.

### Compliance with Ethical Standards

**Conflicts of interest** The authors declare that they have no conflicts of interest.

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