

Sexual Behaviours and Factors Associated with Consistent Condom Use among Young Male Artisanal Miners in Kassanda District

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Abstract

Artisanal and small-scale mining (ASM) is a significant source of income for tens of millions of people worldwide. The burden of sexually transmitted infections (STIs) is disproportionately higher in developing countries and ASM communities are among the high-risk groups. Consistent condom use is pivotal in the prevention of HIV/AIDS and other STIs. This study assessed sexual behaviors and factors associated with consistent condom use among young male artisanal miners in Kassanda District, Uganda. It involved a cross-sectional survey of 304 young male artisanal miners aged 15-24 years. Data analysis included frequency distributions, chi-squared tests, and binary logistic regression. Results show that the majority (89%) of the respondents had sexual intercourse during the year preceding the study, 55% had multiple sexual partners, 11% engaged in transactional sex and only 42% reported consistent condom use. Married/cohabiting young men (OR=0.41; CI=0.19-0.87), those that had a neutral attitude towards condom use (OR= 0.30; CI=0.11-0.85), and those that only had mothers as their only parent (OR= 0.37; CI=0.19-0.73) had reduced odds of consistent condom use. The reduced odds of consistent condom use among married/cohabiting young men highlights a high risk of disease transmission. Reduced odds among young men raised by single mothers highlight gender-associated parenting issues. Interventions promoting consistent condom use should place emphasis on young men who are married and those with only their mothers.

Keywords: Sexual Behaviours, Consistent Condom Use, Young Male, Artisanal Miners, Uganda

Introduction

Artisanal and small-scale mining (ASM) is a significant source of income for tens of millions of people worldwide¹. According to current estimates, at least 40 million people globally work directly in the ASM sector, and about 300 million people in more than 70 countries depend indirectly on the sector. Artisanal and small-scale gold mining produces about 10-15% of the world's gold. ASM refers to small groups and individuals engaged in low-cost and labor-intensive excavation of minerals using minimal mechanization³. In sub-Saharan Africa, a region long scarred by poverty, artisanal and small-scale mining is widespread. Although estimates vary, in sub-Saharan Africa, at least 20 million people are employed directly in the artisanal mining sector, and an additional 100 million individuals depend upon its activities indirectly for their livelihoods⁴. In Uganda, the sector is estimated to support more than 190,000 persons' livelihoods, far more than the roughly 2,000 jobs offered by the country's formal industrial mining sector. In 2017 artisanal mining and quarrying accounted for around 0.6% of the GDP according to the Uganda Bureau of Statistics⁵. Research further indicates that more than 50% of people working in the ASM sector are young men⁶.

Consistent condom use is important for protection against Sexually Transmitted Infections (STIs) including HIV/AIDS⁷. Safer sex practice is a phrase often used to refer to a combination of measures that include condom use that presents a lower risk of STIs. The maximum protective effect of condoms is achieved with consistent rather than occasional use⁸. Sexually Transmitted Infections, majorly HIV/AIDS continue to be a major global public health issue. Each year, an estimated half a billion new curable sexually transmitted infections occur worldwide; nearly half of the infections occur among young people aged 15–24 years⁹. In 2020, an estimated 38.4 million people in the world were living with HIV with over 650 000 deaths¹⁰. In Uganda, HIV prevalence has increased rapidly over the years. According to the Ministry of Health estimates for 2020, over 1.4 million

adults and children are living with HIV. The prevalence among adults (15-49 years) is 5.4%. However, there are considerable regional differences in HIV prevalence. A study conducted in Zimbabwe indicates that mining communities are particularly affected^{11, 12}.

Research indicates that most miners are migrant workers. Hence, the prolonged separation from their wives/partners encourages them to engage in sexual relationships with other women many of which are transactional^{12, 13, 14}. Owing to the catastrophic and stressful nature of work, many young men seek to optimize pleasure during leisure time. Popular activities include alcohol consumption and intimate relationships. Sex workers also target these young men because they believe that they are relatively well-paid¹⁶. Various studies have identified several predictors of consistent condom use in Uganda and elsewhere. A study conducted in South Africa highlighted marital status as a significant determinant of consistent condom use. The study found out that married individuals are less likely to practice consistent condom use¹⁷. Another study conducted among fishing communities in Uganda indicated that Muslims were more likely to report consistent condom use than Christians¹⁸. A study conducted among Gold mining workers in Ethiopia showed that respondents who had high perceived susceptibility for HIV were 2.63 more likely to practice preventive behaviors than respondents with low perceived susceptibility⁷. Relatedly, an Ethiopian study among mining workers pointed out that mining workers who completed secondary tertiary school were 2.66 and 5.4 times more likely to engage in HIV preventive behavior as compared with those who were illiterate¹⁹. Other determinants identified by the various studies include age, residence, ethnicity, and income level among others^{20, 21, 22, 19, 23, 24}.

Most of these studies conducted in mining communities have focused on miners in the formal sector, neglecting the artisanal mining communities that have increased over the years²⁵. SRH issues of young men who constitute a big percentage of workers in ASM have not been examined in Uganda²⁶. This study examined sexual behaviors and factors associated with consistent condom use among young men (15-24 Years) in the Artisanal mining sector in Kassanda district of Central Uganda.

Methods

Study design

The study employed a cross-sectional study design that entailed a survey among young male artisanal miners.

Study population and study area

The study participants included young men aged 15-24 years who worked in the mines or those who were participating in mining-related activities. The study was conducted in Kassanda district one of the main gold mining areas in Uganda.

Sample size determination and sampling procedure

A sample size of 384 was obtained using the Keish-Leisle formula, however, a total of 304 interviews were conducted indicating a response rate of 79.2%. A two-stage cluster sampling methodology was used to select the targeted respondents for the survey. At the first stage, sub-counties were sampled from the artisanal mining communities. At the second stage, mining sites were identified from each sub-county. Young men aged 15-24 in the selected mining sites were interviewed (face to face) using a structured questionnaire.

Data collection

Data were collected in the selected artisanal mining communities. The data were collected using an interviewer-administered structured questionnaire designed on mobile tools using the Kobo Collect software platforms. The predominantly pre-coded questionnaire was administered by trained research assistants. Pre-testing the tools was done to establish the probable challenges that could be encountered during the actual data collection. The survey questionnaire captured information about the respondent's demographic and socio-economic characteristics, sexual activity, multiple sexual partnerships, transactional sex, condom use, and other relevant information on consistent condom use.

Data Analysis

Data from Kobo collect was exported to STATA version 17.0 for coding and analysis. The analysis entailed three stages: frequency distributions to describe the characteristics of the respondents; Chi-squared (χ^2) tests;

and binary logistic regression. At the bivariate level of analysis, we assessed associations between independent variables and the dependent variable using chi-squared tests. The level of statistical significance was set at $p < 0.05$. All significant variables and variables with a p-value of 0.2 or less at bivariate level were considered for logistic regression after testing for multicollinearity.

Results

Background characteristics of the respondents

The results in Table 1 show that the majority of the respondents (63%) were 20-24 years old, had primary education (69%), were single (69%), and had no children (57%). Most of the respondents were household heads (75%), lived in the mining community (75%), had both their parents (63%), did not live with their parents (93%), and were migrants (78%). Concerning religion, the highest proportion were Catholics (27%) followed by Pentecostals (23%), were Banyankole-Bakiga by ethnicity (24%) and consumed alcohol (60%).

Sexual behaviours and consistent condom use

The majority of the respondents had ever engaged in sexual intercourse (89%) and had sexual intercourse during the 12 months preceding the study (89%). The median age at first intercourse was 16 years. More than half (55%) of the respondents had more than one sexual partner in the last 12 months. The average number of sexual partners in the last 12 months was about 8 (7.6). On average, young men had about 16 (15.6) lifetime sexual partners. About one in ten men (11%) reported engaging in transactional sex in the last 12 months. The majority of the respondents (98%) had used a condom, and almost half of the respondents (50%) reported using a condom during the last sexual intercourse. Less than half (42%) reported consistent condom use in the last 12 months (See Table 2). The main reasons for inconsistent condom use were trusting partners (33%), being married (32%), and dislike of using condoms (20%).

Differentials in consistent condom use

Results in Table 3 show that the association between marital status ($p=0.009$), alcohol consumption ($p=0.035$), relationship with the partner ($p=0.012$), having children ($p=0.006$), survival status of parents ($p=0.011$) and consistent condom use was statistically significant. Higher proportions of consistent condom use were evident among single young men (49%), those who did not consume alcohol (49%), had sexual intercourse with strangers (46%), had no children (49%), and those who had both their parents alive (49%).

Table 1: Background characteristics of the respondents (n=304)

Variables	Categories	n	(%)
Age	15-17	30	9.9
	18-20	82	27.0
	21-24	192	63.2
Education level	No education	17	5.6
	Primary	209	68.8
	Secondary+	78	25.6
Religion	Anglican	64	21.1
	Catholic	82	27.0
	Muslim	60	19.7
	Pentecostal	70	23.0
	Others	28	9.2
Ethnicity	Muganda	63	20.7
	Munyankole-Mukiga	74	24.3
	Mufumbira	39	12.8
	Munyolo-Mutoro	19	6.3
	Mukonjo	23	7.6
	Foreigners	56	18.4
Marital status	Others	30	9.9
	Single	209	68.8
	Married/Cohabiting	81	26.6
	Separated/Divorced	34	4.6
Residence	At the mining site	76	25.0
	In the community	228	75.0
Head of household	Respondent	227	74.7
	Parent/Relative	38	12.5
	Employer	25	8.2
	Friend	14	4.6
Lives with parents	No	283	93.1
	Yes	21	6.9
Migration status	Non-migrants	68	22.4
	Migrants	236	77.6
Alcohol use	No	123	40.5
	Yes	181	59.5
Parents are alive	All are alive	192	63.1
	Father is alive	18	5.9
	Mother is alive	75	24.7
	All are dead	19	6.3
Having children	No	153	56.5
	Yes	118	43.5

Table 2: Sexual behaviours and consistent condom use (n=304)

Variables	Categories	n	(%)
Ever engaged in sexual intercourse	No	33	10.9
	Yes	271	89.1
Recent sexual activity	Within one year	240	88.6
	More than one year	31	11.4
Relationship with the sexual partner	Spouse/Partner	112	41.3
	Friend/acquaintance	114	42.1
	Others	45	16.6
Partner's age	12-17	49	18.2
	18-24	194	72.1
	25+	26	9.7
Multiple sexual partnerships	No	122	45.0
	Yes	149	55.0
Transactional sex	No	240	88.6
	Yes	31	11.4

Table 3: Differentials of consistent condom use

Study variable	Category	Yes (n)	Yes (%)	p-value
Age	15-17	6	42.9	0.530
	18-20	31	47.7	
	21-24	71	39.7	
Education level	No education	7	53.9	0.666
	Primary	74	41.3	
	Secondary+	27	40.9	
Religion	Anglican	20	36.4	0.914
	Catholic	30	44.1	
	Muslim	22	44.0	
	Pentecostal	25	43.1	
	Others	11	40.7	
Marital status	Single	82	48.5	0.009
	Married/Cohabiting	21	27.6	
	Separated/Divorced	5	38.5	
Residence	At the mining site	27	43.5	0.757
	In the community	81	41.3	
Ethnicity	Muganda	17	34.7	0.815
	Munyankole-Mukiga	33	49.3	
	Mufumbira	13	43.3	
	Mukonjo	6	45.0	
	Munyolo-mutoro	9	37.5	
	Foreigners	19	39.6	
	Others	11	39.3	
	Others	11	39.3	
Multiple sexual partnerships	Yes	68	35.4	0.063
	No	40	46.9	
Transactional sex	Yes	15	48.4	0.432
	No	93	41.0	
Head of household	Respondent	83	40.7	0.480
	Friend/Relative	13	54.2	
	Employer	6	33.3	
	Friend	6	50.0	
Lives with parents	Yes	7	58.3	0.236
	No	101	41.1	
Migration status	Non-migrants	45	45.0	0.290
	Migrants	63	39.9	
Has children	Yes	37	32.5	0.006
	No	71	49.3	
Alcohol use	Yes	53	36.8	0.035
	No	55	48.2	
Sexual partner's age	12-17	20	43.5	0.054
	18-24	72	38.7	
	25+	16	36	
Attitude on condom use (Condom use reduces sexual pleasure)	Agree	84	43.5	0.117
	Neutral	6	23.1	
	Disagree	18	46.2	
Relationship with the sexual partner	Partner or spouse	39	37.5	0.012
	Friend, acquaintance	45	40.9	
	Others	24	54.5	
Whether parents are alive	All are alive	79	49.4	0.011
	Father is alive	6	40.0	
	Mother is alive	6	25.8	
	All are dead	17	35.3	

Determinants of consistent condom use

The determinants of consistent condom use were assessed at the third stage of analysis using the logistic regression model. The first category of each independent variable was considered as a reference category. Having children was omitted from the model because it showed multicollinearity with marital status. Ethnicity was also omitted from the model because it showed multicollinearity with migration status. Variables with a p-value of 0.2 or less at bivariate level were also included in the model. Variables with a p-value greater than 0.2 at bivariate level were omitted from the model (see Table 4).

According to Table 4, the predictors of consistent condom use among young male artisanal miners in Kassanda district were: marital status, attitude towards condom use, and survival status of parents. Married or cohabiting young male artisanal miners were less likely to use a condom consistently compared to single young men (OR=0.41; CI=0.19-0.87). Young male artisanal miners who had a neutral attitude towards condom use were less likely to consistently use a condom compared to those who agreed that condom use reduces sexual pleasure (OR= 0.30; 0.11-0.85). Concerning parents' survival status, young male artisanal miners who only had mothers as parents were less likely to consistently use a condom compared to those who had both their parents (OR= 0.37; 0.19-0.73).

Table 4: Predictors of consistent condom use

Variable	Categories	P-value	Odds Ratios	95% CI
Migration status	Non-migrants*			
	Migrants	0.824	0.94	0.53-1.66
Lives with parents	No*			
	Yes	0.339	1.92	0.51-7.28
Alcohol use	No*			
	Yes	0.108	0.63	0.29-0.94
Attitude towards condom use	Agree*			
	Neutral	0.024	0.30	0.11-0.85
	Disagree	0.420	1.37	0.64-2.94
Marital status	Single*			
	Married/Cohabiting	0.02	0.41	0.19-0.87
	Separated/Divorced	0.52	0.66	0.18-2.37
Age of partner	12-17*			
	18-24	0.456	0.76	0.36-1.57
	25+	0.335	1.73	0.57-5.31
Relationship with partner	Partner/Spouse*			
	Friend/acquaintance	0.919	0.97	0.52-1.79
	Others	0.343	1.49	0.65-3.40
Multiple partners	No*			
	Yes	0.333	1.34	0.74-2.40
Parents alive	All are alive*			
	All are dead	0.70	0.87	0.28-2.75
	Father is alive	0.65	0.80	0.25-2.56
	Mother is alive	0.004	0.37	0.19-0.73

Discussion

Young male artisanal miners' recent engagement in sexual intercourse (89%), multiple sexual partnerships (55%), and transactional sex (11%), is higher compared to the general population of young men of the same age in Uganda. The DHS report 2016²⁷ indicates that only 51% of young men aged 15-24 had sexual intercourse during the year preceding the survey, only 14% had more than one sexual partner, and only 6% engaged in transactional sex. Condom use during the last sex was lower among the artisanal miners (50% compared to 57% of young men in the general population). These findings are consistent with the findings of other studies conducted in the mining areas of Nigeria, Mozambique, and South Africa. A study conducted in South Africa established that mining operations increase the likelihood of multiple sex partners, high-risk sex partners, and condom-less sex^{28 29 30}. This highlights the need for targeted interventions to address risky behaviors prevalent in this population.

The results showed that marital status was significantly associated with consistent condom use, young male artisanal miners who were married/cohabiting were less likely to consistently use a condom as compared to those who were single (OR= 0.41; CI= 0.19-0.87). Married couples often find no reason for consistent condom use in marriage due to trust and the need for childbearing³¹. This finding is consistent with the findings of a study conducted on South African miners which found out that married, divorced, or widowed individuals were less likely to use condoms as compared to unmarried individuals²³. The findings also agree with those of a study that found out that married individuals are less likely to practice safer sex practices. The study found out that condom use and HIV prevention behaviours include the perceptions that known and/or trusted partners, as well as monogamous relationships, are 'safe', rendering condom use unnecessary³². Besides interventions to improve condom self-efficacy, regular HIV testing and awareness and use of pre-exposure

prophylaxis are among effective interventions for the prevention of HIV and STIs, especially for individuals who find condoms to be inappropriate in their relationships.

Findings also revealed that young male artisanal miners who had only their mothers alive were less likely to consistently use a condom as compared to those who had all their parents alive. This highlights gendered roles in parenting concerning sex education where young men who lack fathers (figures) are at risk of risky sexual behaviors. Mothers rarely engage boys on sexual and reproductive health issues including condom use and believe that engaging boys on such issues should be a father's role. This finding is consistent with the findings from a study conducted in Eastern Uganda which established that while children and parents commonly discussed sexual abstinence, HIV and AIDS, and bodily changes, the least discussed topics were contraception and condoms. This was attributed to conservative attitudes towards adolescent sex where parents thought that communicating with their children about condoms and contraceptives connotes sex which makes it an embarrassing and uncomfortable topic as opposed to preventing HIV and sexual abstinence³³. This highlights a need to promote parent-child communication on issues related to sexual and reproductive health. This will enable the young boys to obtain relevant information from their parents on various SRH issues including condom use which will in the end result in consistent condom use.

Relatedly, the young men's attitude towards condom use was statistically associated with consistent condom use, young male artisanal miners who had a neutral attitude towards condom use were less likely to consistently use a condom as compared to those who agreed that condom use reduces sexual pleasure. In this case, a neutral attitude leans towards inconsistent condom use and perhaps social desirability. This finding is in line with findings of a study conducted among Namibian Miners whereby the majority of respondents who agreed that condom use reduces sexual pleasure and also weakens the penis were less likely to consistently use a condom as compared to those who disagreed³⁴. Although the study established that most of the participants were aware of condom use, most of them did not use condoms because they trusted their partners, were married, and never liked condoms therefore more needs to be done through behaviour change communication to improve consistent condom use among artisanal miners. Awareness sessions need to be conducted on the dangers of unprotected sex. These should also be aimed at removing negative attitudes towards condom use.

Limitations

Due to the busy schedules of respondents, poor road network to the mines as well as unfavorable weather conditions, the sample size was small which might have contributed to the wider confidence intervals and failure of the observed associations to achieve statistical significance.

Also, due to the reliance on self-reporting of consistent condom use, one cannot exclude the possibility of under-reporting of inconsistent condom use owing to the result of social desirability bias. It is also important to note that people with multiple partners may not use condoms with their regular partners but use condoms with their casual partners.

Conclusion and recommendations

The findings showed that whereas sexual activity, multiple sexual relationships, and transactional sex are markedly higher among young artisanal miners relative to their counterparts in the general population, the level of consistent condom use is low. This increases the risk for sexually transmitted diseases in ASM communities and beyond. Young men who were married/cohabiting, those who had a neutral attitude towards condom use, and those whose surviving parent was the mother were less likely to use condoms consistently. It is important to promote parent-child communication on SRH, and safer sex for both male and female young persons. Awareness raising on the dangers of unprotected sex and behavior change communication to promote responsible sexual behaviors among artisanal miners, including consistent condom use are essential. In addition to improving condom self-efficacy, regular STI and HIV testing and emergency use of pre and post-exposure prophylaxis should be promoted.

Ethics approval and consent to participate

Ethical clearance to conduct this study was obtained from the TASO Research Ethics Committee (approval number TASO-2023-218) before data collection. Informed verbal consent from young men aged 18-24 before

the interview was obtained. For young boys 15-17 years, since these were emancipated minors, informed consent was also obtained from them before conducting the interviews.

Contribution of Authors

All authors conceived and designed the study. Natwijuka Patience conducted data collection, analyzed data, and prepared the initial draft of the manuscript. Stephen Wandera, Hanna Chidwick, Lydia Kapiriri, and Betty Kwagala reviewed and revised the manuscript. All authors approved the final manuscript.

Acknowledgments

The authors appreciate IDRC for funding the research and appreciate participants who voluntarily responded to the questionnaire and the research assistants who collected the data.

References

1. Schwartz FW, Lee S, Darrah TH. A Review of the Scope of Artisanal and Small-Scale Mining Worldwide, Poverty, and the Associated Health Impacts. *GeoHealth*. 2021;5(1). doi:10.1029/2020GH000325
2. Buss D, Rutherford B, Hinton J, et al. Gender and artisanal and small-scale mining in central and east Africa : Barriers and benefits. Published online 2017:59. <http://grow.research.mcgill.ca/pubs/gwp-02-2017.pdf>
3. USAID. Gender Issues in the Artisanal and Small-Scale Mining Sector. 2019;(May 2020):1-19. <https://www.land-links.org/wp-content/uploads/2020/05/USAID-ASM-and-Gender-Brief-1-June-20-Final.pdf>
4. Hilson G. Artisanal and small-scale mining and agriculture Exploring their links in rural sub-Saharan Africa. *Int Inst Environ Dev*. 2016;(March).
5. Serwajja E, Mukwaya PI. Environmental, health and safety intricacies of artisanal mining in the gold-rich landscapes of Karamoja, north-eastern Uganda. *J Sustain Min*. 2021;20(2):90-108. doi:10.46873/2300-3960.1055
6. Intergovernmental Forum on Mining, Minerals M and SD (IGF). GLOBAL TRENDS IN ARTISANAL AND SMALL-SCALE MINING (ASM): A REVIEW OF KEY NUMBERS AND ISSUES Secretariat hosted by Secretariat funded by. Published online 2018. <http://pubs.iied.org/pdfs/G04266.pdf>
7. Nigussie T, Mamo Y, Qanche Q, Yosef T, Wondimu W, Asefa A. HIV Preventive Behaviors and Associated Factors among Gold Mining Workers in Dima District, Southwest Ethiopia, 2019: Community-Based Cross-Sectional Study. *Biomed Res Int*. 2021;2021:1-9. doi:10.1155/2021/4797590
8. Ezekiel MJ, Metta JN, Mosha IH. Sexual Relationship, Power and Safe Sex Practices among Female Bar Workers in Kinondoni Municipality, Dar es Salaam, Tanzania. *Eur J Med Heal Sci*. 2022;4(1 SE-Articles):21-26. <https://www.ej-med.org/index.php/ejmed/article/view/1153>
9. Awoleye AF, Solanke BL, Kupoluyi JA, Adetutu OM. Exploring the perception and socio-cultural barriers to safer sex negotiation among married women in Northwest Nigeria. *BMC Womens Health*. 2022;22(1):1-10. doi:10.1186/s12905-022-01989-3
10. UNAIDS. 2020 Uganda HIV -AIDS fact sheet, 6th Sept 2021. 2020;2021(December 2020).
11. Coates DR, Chin JM, Chung STL. HIV-1 and STIs Prevalence and Risk Factors of Miners in Mining Districts of Yunnan, China. *Bone*. 2011;23(1):1-7. doi:10.1097/QAI.0b013e3181c7d8d2.HIV-1
12. Murewanhema G, Musuka G, Gwinji PT, Dzobo M, Dzinamarira T. Sexually transmitted infections among artisanal miners in Zimbabwe: An urgent need for enhanced preventive measures. *Public Heal Pract*. 2022;4(June):100284. doi:10.1016/j.puhip.2022.100284
13. Rustad SA, Ostby G, Nordas R. Does Artisanal Mining Increase the Risk of Sexual Violence? *Qual Prim Care*. 2016;24(2):77-80. <http://primarycare.imedpub.com/does-artisanal-mining-increase-the-risk-of-sexualviolence.pdf>
14. GIZ. Sexual and Gender-Based Violence in the Mining Sector in Africa. “programme Extractives and Development.” Published online 2020.
15. Martins-Fonteyn E, Loquiha O, Baltazar C, et al. Factors influencing risky sexual behaviour among Mozambican miners: A socio-epidemiological contribution for HIV prevention framework in Mozambique. *Int J Equity Health*. 2017;16(1). doi:10.1186/s12939-017-0674-z
16. Baltazar CS, Horth R, Inguane C, et al. HIV Prevalence and Risk Behaviors Among Mozambicans Working in South African Mines. *AIDS Behav*. 2015;19(1):59-67. doi:10.1007/s10461-014-0941-6
17. Engedashet E, Worku A, Tesfaye G. Unprotected sexual practice and associated factors among People Living with HIV at Ante Retroviral Therapy clinics in Debrezeit Town, Ethiopia: A cross-sectional study. *Reprod Health*. 2014;11(1):1-9. doi:10.1186/1742-4755-11-56
18. Nakazibwe HG, Muturi-Kioi V, Abaasa A, Kibengo F, Hughes P, Price M. Factors associated with consistent condom use in Ugandan fishing communities’ cohort. *PAMJ - One Heal*. 2022;7. doi:10.11604/pamj-oh.2022.7.29.32361

19. Abdissa HG, Lemu YK, Nigussie DT. HIV preventive behavior and associated factors among mining workers in Sali traditional gold mining site bench maji zone, Southwest Ethiopia: A cross-sectional study. *BMC Public Health*. 2014;14(1):2-9. doi:10.1186/1471-2458-14-1003
20. Jorjoran Shushtari Z, Salimi Y, Hosseini SA, Sajjadi H, Snijders TAB. Determinants of safe sexual behavior of female sex workers in Tehran: the woman, her network, and the sexual partner. *BMC Public Health*. 2021;21(1):1-11. doi:10.1186/s12889-021-12266-7
21. Logie CH, Lys CL, Mackay K, MacNeill N, Pauchulo A, Yasseen AS. Syndemic Factors Associated with Safer Sex Efficacy Among Northern and Indigenous Adolescents in Arctic Canada. *Int J Behav Med*. 2019;26(4):449-453. doi:10.1007/s12529-019-09797-0
22. Emmanuel W, Edward N, Moses P, et al. Condom Use Determinants and Practices Among People Living with HIV in Kisii County, Kenya. *Open AIDS J*. 2015;9(1):104-111. doi:10.2174/1874613601509010104
23. Chandran TM, Berkvens D, Chikobvu P, et al. Predictors of condom use and refusal among the population of Free State province in South Africa. *BMC Public Health*. 2012;12(1):1. doi:10.1186/1471-2458-12-381
24. Mburano JRR, Djourdebbe FB, Ekamb EE. Social and Individual Factors Associated with Condom Use among Single Youths: An Analysis of the 2018 Cameroon Demographic and Health Survey. 2020;(September).
25. Sana A, De Brouwer C, Hien H. Knowledge and perceptions of health and environmental risks related to artisanal gold mining by the artisanal miners in Burkina Faso: A cross-sectional survey. *Pan Afr Med J*. 2017;27:1-14. doi:10.11604/pamj.2017.27.280.12080
26. Weldegiorgis, F., Lawson, L. and Verbrugge H. Women in Artisanal and Mining : Challenges and opportunities for greater participation. 2014;(January 2018).
27. UBOS. Uganda Demographic and Health Survey 2016. *Udhs*. Published online 2016:625. www.DHSprogram.com
28. Magak E. Communities in Africa are twice as likely to have HIV when mines open nearby. 2022;(October).
29. Formson C, Hilhorst D. Researching livelihoods and services affected by conflict The many faces of transactional sex : Women's agency, livelihoods, and risk factors in humanitarian contexts: A Literature Review. 2016;7(February). http://www.securelivelihoods.org/publications_details.aspx?resourceid=393
30. Baltazar CS, DeLima YV, Ricardo H, et al. HIV prevalence and TB in migrant miners communities of origin in Gaza Province, Mozambique: The need for increasing awareness and knowledge. *PLoS One*. 2020;15(4):1-14. doi:10.1371/journal.pone.0231303
31. Cele LP, Vuyani S, Huma M. Determining the level of condom use and associated factors among married people in the Tshwane district of South Africa. *Pan Afr Med J*. 2021;40. doi:10.11604/pamj.2021.40.11.26681
32. Thorburn SSMH& EAR. HIV prevention heuristics and condom use among African-Americans at risk for HIV, *AIDS Care*. 2005;17(3):335-344. doi:10.1080/09540120412331299762
33. Kisaakye P, Ndugga P, Kwagala E, Kayitale Mbonye M, Ngabirano F, Ojiambo Wandera S. Parent-child communication on sexual and reproductive health in border districts of Eastern Uganda. *Sex Educ*. 2022;00(00):1-13. doi:10.1080/14681811.2022.2135500
34. Ajayi AI, Ismail KO, Akpan W. Factors associated with consistent condom use: A cross-sectional survey of two Nigerian universities. *BMC Public Health*. 2019;19(1):1-11. doi:10.1186/s12889-019-7543-1