HIV Preventive Behaviors and Associated Among Gold Mining Workers in Dima District, Southwest Ethiopia, 2019: Community Based Cross-Sectional Study

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Abstract

Background: The prevalence of HIV/AIDS is increasing over time, leading to a significant number of life losses. According to the USAID 2018 report, 36.9 million (35.1 million adults) people globally were living with HIV, 1.8 million people became newly infected with HIV, and 940 000 people died from AIDS-related illnesses in 2017. Mining workers are at high risk of acquiring HIV and infecting others, while successful preventive m easures are a key solution.

Objective: To assess HIV preventive behaviors among gold mining workers in Dima district, southwest Ethiopia, 2019

Methods and materials: A community-based cross-sectional study was conducted from March 1st to 31st, 2019. The data were collected through face-to-face interviews. The collected data were coded and entered into Epidata version 4.2.0.101, cleaned, and analyzed using SPSS version 21 statistical software. A binary logistic regression was conducted to determine the association using odds ratios at 95% confidence intervals. A P-value of less than 0.05 considered as the level of significance for HIV preventive behaviors.

Results: Of 279 (61.3%) of the respondents have good practices of HIV prevention. Factors associated with good preventive practice were not alcohol drinkers (AOR= 2.86, 95%CI:1.30-6.29), not chew Khat (AOR= 2.09, 95%CI: 1.09-4.02), having good knowledge about HIV (AOR=1.81, CI:1.16-2.83), favorable attitude towards HIV prevention (AOR=4.76, 95%CI:3.02-7.49), and high perceived susceptibility to HIV were (AOR=2.63, 95%CI:1.63-4.24).

Conclusion: Only about 61% of the mining workers in the study area were practiced HIV preventive behaviors. Not alcohol drinkers, having good knowledge about HIV, having a favorable attitude toward HIV prevention, and having high perceived susceptibility to HIV were factors associated with the practice of HIV preventive behaviors. Efforts have to be made by local governments and other concerned bodies to increase preventive behavior.

Background

The prevalence of HIV/AIDS is increasing over time, leading to a significant number of life losses (1, 2). HIV epidemics continue to represent a public health threat worldwide, leading to causing deaths in sub-Saharan Africa (3). According to the USAID 2018 report, 36.9 million (35.1 million adults) people globally were living with HIV, 1.8 million people became newly infected with HIV, 940 000 people died from AIDS-related illnesses in 2017. Most at-risk populations (MARPs) and their sexual partners account for 47% of new HIV infections globally and 16% of new HIV infections in eastern and southern Africa. The risk of acquiring HIV is 13 times higher among female sex workers (1).

The adult HIV prevalence in Ethiopia in 2016 was estimated to be 1.1%. There is substantial prevalence variation by region (6.6% in Gambella, 5.0% in Addis Ababa, and 0.7% in Southern Nations, Nationalities

and Peoples' (SNNPR) region) of Ethiopia (2). According to Ethiopia Public Heath Inistitute 2017 report, the prevalence of HIV shows a significant increment in adults of both sexes, but the incidence shows slow decrement. The annual AIDS-related deaths become decline from time to time (4).

Considering the fatal increment of HIV prevalence, there is a great struggle globally to end its epidemic. In 2014 UNAIDS launched new targets named 90-90-90 to help end the AIDS epidemic. According to this new target, by 2020, 90% of all people living with HIV will know their HIV status, 90% of all people with diagnosed HIV infection will receive sustained ART and 90% of all people receiving ART will have viral suppression. In 2017 the global achievement of these three 90 s was 75%, 79%, and 81% respectively which shows the need for extra effects for the full achievements (1, 5). HIV testing is among the effective preventive activities. It can be the provider-initiated, voluntary based or self-test approach. It is being implemented in a major segment of the population by paying due attention to key populations like sex and mining workers (6–8). The numbers of HIV testing among people in Sub Saharan Africa have increased by 66% in the past decade and about one-third are diagnosed late, results in an increase in the risk of HIV related morbidity and also can result in onwards transmission of HIV in the community (9).

Mining workers are among a population classified as Most-At-Risk Populations (MARPS). This is to indicate that the risk occurrence of HIV infection among this population is high. To control the HIV in general population controlling the disease in this population is a key issue (8, 10–13). For the successful control, evidence on prevalence rate, the practice of prevention methods and experience of key populations are important.

The factors that contribute for the high prevalence of HIV/ AIDS are diverse and might include education, income, female labor force participation, place of residence, demographic and cultural factors, male circumcision, condom use, access to counseling and testing, knowledge and awareness of HIV/AIDS virus and access to antiretroviral therapy (14–16).

HIV prevention is a complex issue with no magic bullet for its success (17). However, having good knowledge, attitudes and practices (KAP) of HIV prevention are essential in order not to acquire HIV infection and to prevent the disease from spreading (9). Adults, mining workers are the highest risk populations in acquiring HIV/AIDS when compared to others (8). An improved knowledge, change attitude and change behavior are considered as the main factors that increase HIV test uptake (18). So, this study was aimed to assess HIV preventive behaviors among mining workers in Dima woreda, southwest Ethiopia, 2019.

Methods And Materials

Study area and period

The study was conducted in Dima district, Gambella region southwest Ethiopia from March 1st to 31st, 2019. Dima woreda is one of the woredas in Agnuak Zone, Gambela Region of Ethiopia. The Dima district

is among HIV high prevalent areas in Ethiopia. There are several miners and commercial sex workers in the area. There about ten mining center in the district.

Study design

A community-based cross-sectional study was conducted among mining workers in Dima woreda.

Population

The source population were all mining workers in Dima district while the study population were randomly selected mining workers in Dima woreda.

Eligibility criteria

Adults with age ≥ 18 were included in this study. Adults who fulfill the inclusion criteria but who are severely ill or unable to verbally communicate during the data collection time were excluded from the study.

Sample size determination and sampling technique

The sample size was determined by using single population proportion formula considering the following assumptions p = 50 percent (the proportion of good preventive behaviors); d = 0.05 margin of error and 95% confidence level with a value of Z = 1.96. $n= (Z\ \alpha/2)^2\ P\ (1-P)/d^2 = 384$. Using a non-response rate of 20% which give a final sample size of 461.

Regarding the sampling procedure, there are 10 rural kebeles in Dima district where mining workers mostly found. We have randomly selected 50% from these kebeles and the sample size was equally allocated for each of them and a convenience sampling technique was used to get mining workers for interview.

Study variables

Dependent variable

HIV preventive behaviors.

Independent variables – socio-demographic characteristics (age, sex, marital status, occupation, educational status, income), cultural factors and lifestyle factors. Knowledge of HIV and its revention.

Data collection tools and procedures

A structured questionnaire was developed from different works of literature (19–22). The questionnaire has parts like socio-demographic, behavioural profile, knowledge of HIV, Practices of HIV prevtive beahaviours and perceptions of HIV. Questionnaires were translated to Amharic from the English version. Then, back to English by an independent person to assure its accuracy. The questionnaire was pre-tested on 5% of the total sample size, which is a similar population to the study area Bero district. Bero the

nearer district with numbers mining sites. The collected data were evaluated for completeness, clarity, and consistency by the supervisor and principal investigator on a daily basis. Ten data collectors and three supervisors who were qualified with bacheol of science (BSc) in Nursing were recruited and trained for two days before a data collection on data collection tool, approach to the interviewees, details of interviewing techniques, respect and maintaining privacy, and confidentiality of the respondents.

Data quality management

The English version questionnaire was first to be translated to the Amharic language. Then, it translated back into English to check for its consistencies. Two days of training were given for the data collectors and supervisors concerning the objectives and data collection procedures. Finally, pre-testing was conducted on 5% of the sample outside the district. Close supervision was made daily to ensure the completeness and consistency of the filled questionnaires. Epidata manager version 4.0.2.101 was used for data entry to minimize errors during data entry.

Data processing and analysis

The collected data were coded and entered using Epidata manager version 4.0.2.101, cleaned and analyzed using SPSS version 21 statistical software. Summary statistics for different variables were presented using frequency tables and graphs. A binary logistic regression was computed to determine the association using crude and adjusted odds ratios at 95% confidence intervals. Independent variables with p-values less than 25% were a candidate for multivariable logistic regression. A p-value of less than 0.05 will be considered as the level of significance for HIV preventive behaviours in multivariable logistic regression.

Measurement and operational definitions

Knowledge

It was measured by 17 yes or no questions. Then the mean score were computed and participants who scored greater mean score of knowledge questions were categorized as knowledgeable and not knowledgeable otherwise.

Attitude

Assessed by 20 likert question ranging from 1 to 5 (strongly disagree to strongly agree). The negative questions were reverse coded and mean score was computed. Participants who scored greater than mean score of attitude questions were categorized as have a positive attitude and have a negative attitude otherwise.

Perceived severity

Assessed by 6 likert question ranging from 1 to 5 (strongly disagree to strongly agree). The negative questions were reverse coded and mean score was computed. Participants who scored greater than mean score of were categorized as having a high perceived severity otherwise low.

Perceived susceptibility

Assessed by 6 likert question ranging from 1 to 5 (strongly disagree to strongly agree). The negative questions were reverse coded and mean score was computed. Participants who scored greater than mean score of attitude questions were categorized as having a high perceived susceptibility otherwise low.

HIV preventive behavior- if an individual is abstaining from sexual intercourse in the last six months until the time of study period or, having only one sexual partner and tested for HIV before their first sexual relationship, tested for HIV infection in last three month of the study period and consistently use a condom it was said to be in HIV preventive behavior (23).

Results

Socio-demographic characteristics of mining workers

A total of 455 respondents participated in giving a response rate of 98.6%. Majority of the respondents between the age group of 25–34 years 220 (48.4%). The mean age of the participant was 25.84 (5.34 SD). Three hundred (65.9%) of the respondents were single in marital status. Regarding their religion 274 (60.8%) follower followers of orthodox Christianity. Concerning ethnicity, 126 (27.7%) of the respondents were Amhara. One hundred fifty (33%) of the respondents were completed in secondary school. Regarding the median monthly income of respondents was 1000 ETB, and 256 (56.3%) of them were earning less than 1000 ETB. Table 1.

Table 1
Socio-demographic characteristics among mining workers in Dima district Gambella region southwest Ethiopia November 2019

Variables	Frequency	Percent
Age group		
< 20	26	5.7
20–24	173	38.0
25–34	220	48.4
> 35	36	7.9
Marital status		
Single	300	65.9
Married	95	20.9
Divorced/Widowed	60	13.2
Religion		
Orthodox	274	60.8
Muslim	90	20.0
Protestant	85	18.8
Ethnicity		
Bench	37	8.1
Meinit	30	6.6
Amhara	126	27.7
Wolayita	89	19.6
Oromo	62	13.6
Kafa	93	20.4
Other*	18	4.0
Educational status		
No education	47	10.3
Primary	223	49.0
Secondary and above	185	40.7
Income		

Variables	Frequency	Percent
less than 1000	256	56.3
1000 and above	199	43.7
* Tigre, Gurhaghe, Hadiya and Sheko		

Knowledge about HIV prevention and the perception of HIV among mining workers

Four hundred twenty-eight respondents mentioned abstinence as the primary measure of HIV prevention. Being faithful was listed by 346 (76.0%). From total respondents, 226 (49.9%) of them had good knowledge regarding HIV prevention methods and perception of HIV while 227 (50.1%) of them had poor knowledge. Table 2.

Table 2
The frequency of correctly answered regarding Knowledge about HIV prevention and the perception of HIV among mining workers in Dima district Gambella region southwest Ethiopia November 2019

	Variable	Frequency (%)
HIV prevention measures	Abstinence	428 (94.1)
	Being faithful	346 (76.0)
	Consistent condom use	252 (55.4)
	Not sharing sharp materials	203 (44.6)
	Getting health information	143 (31.4)
	Treating STI	67 (14.7)
	Male circumcision	62 (13.6)
	PMTCT	121 (26.6)
	ART for exposed individuals	60 (13.2)
	ART for HIV patients	59 (13.0)
Perception of HIV	Withdrawal of the penis before ejaculation prevents HIV transmission	124 (27.3)
	A woman can get HIV if she has anal sex with a man	195 (42.9)
	Washing genitals after prevents HIV transmission	107 (23.5)
	There is a vaccine that for HIV	82 (18.2)
	People are likely to get HIV by kissing	273 (60.2)
	HIV can be transmitted through sharing meals	97 (21.3)
	HIV can be transmitted through the mosquito bite	107 (23.5)

Sources of information about HIV and its prevention

The study participants have access to different sources of information on HIV. The major source of information about HIV was radio. Figure 1.

Practices of HIV prevention among mining workers

From interviewed participants, 415 (91.2%) were sexually active. Two hundred seventy-nine (61.3%) of the respondents have practices of HIV prevention. Three hundred eighty-nine (94.6%) of the respondents were sexually active in the last 12 months. About 235 (57.3%) of the respondents had sexual intercourses with casual partners while 82(20%) of them had sexual intercourses with commercial sex workers. Two

hundred twenty-one respondents (69.5%) had 2 and more sexual partners. Only 282 (81.3%) of them were using a condom consistently. Table 3.

Table 3
Practices of preventive behavior among mining workers in Dima district Gambella region southwest Ethiopia November 2019

Variables	Frequency (%)
Ever sexual intercourse	
Yes	415 (91.2)
No	40 (8.8)
Sexual activity in the last 12 months	
Yes	389 (85.5)
No	22 (4.8)
Sexual partners	
Regular partner	89 (21.7)
Casual partner	235 (57.3)
Commercial sex worker	82 (20.0)
Number of sexual partners	
One	97 (30.5)
Two and above	221 (69.5)
Condom use on last sexual intercourse	
Yes	337 (90.8)
No	34 (9.2)
The habit of condom use	
Consistently	282 (81.3)
Sometimes	53 (15.3)
Rarely	10 (2.9)
Occasionally	2 (0.6)
HIV test with in the last three months	
Yes	182 (40.0)
No	273 (60.0)
Shared sharp materials in the three months	
Yes	107 (23.5)

Variables	Frequency (%)
No	348 (76.5)

Reason for non-consistent condom use

The participated mining works mentioned different reasons for non-consistent which may be risky for HIV transmissions. The most commonly listed reason for non-consistent condom use was forgetfulness after drinking alcohol followed by trusting sexual partners Fig. 2.

Reason for not undergoing HIV testing

The leading reason listed by mining workers for not undergoing regular HIV testing was service is not easily available. Figure 3.

Attitude towards HIV prevention

From total respondents, 250 (54.9%) had a favorable attitude towards HIV prevention while 205 (45.1%) of them had an unfavorable attitude. Regarding susceptibility for HIV 241 (53%) of the respondents had high perceived susceptibility for HIV. Figure 4.

Factors associated with the Practice of HIV preventive behaviors among Mining workers

To control confounding factors multivariable binary logistic regression was conducted and the number of factors was identified as predictors of good practice of HIV prevention. Among those identified factors alcohol drinking is the one. Mining workers those don't drink alcohol were 2.86 times likely to practice preventive behaviors than alcohol drinkers (AOR = 2.86, 95%CI:1.30–6.29). Mining workers those do not chew Khat were 2.09 times more likely to practice preventive behaviors than mining workers chew khat (AOR = 2.09, 95%CI: 1.09–4.02). Also, mining works that had good comprehensive knowledge about HIV were 1.81 times more likely to practice preventive behaviors than their counterparts (AOR = 1.81, CI:1.16–2.83). Mining workers those had favorable attitude towards HIV prevention were 4.76 times more likely to practice preventive behaviors than those with a negative attitude (AOR = 4.76, 95%CI:3.02–7.49). Lastly, respondents those had high perceived susceptibility for HIV were 2.63 more likely to practice preventive behaviors than respondents with low perceived susceptibility (AOR = 2.63, 95%CI:1.63–4.24). Table 4.

Table 4
Factors associated with HIV preventive behaviors among mining workers in Dima district Gambella region southwest Ethiopia November 2019

Variables	Preventive behaviors		COR	AOR
	Yes	No		
Age group				
Less than 26	155	101	1	1
26 and above	124	75	1.08 (0.74–1.58)	1.55(0.96–2.50)
Educational status				
No education	28	19	1	
Primary	123	100	0.84 (0.44–1.58)	0.56 (0.27–1.17)
Secondary and above	128	57	1.52 (0.79–2.95)	1.10 (0.51–2.34)
Alcohol drinking				
Yes	224	160	1	1
No	55	16	2.46 (1.36–4.44)	**2.86 (1.30–6.29) ***
Khat chewing				
Yes	195	146	1	
No	80	30	1.20 (1.25–3.20)	**2.09 (1.09–4.02) ***
Smoking cigarette				
Yes	112	97	1	1
No	167	79	1.83 (1.25–2.68)	1.44(0.91–2.27)
Comprehensive knowledge of HIV				
Poor	122	105	1	1
Good	156	70	1.92 (1.31–2.82)	**1.81(1.16–2.83) ***
Attitude towards HIV prevention				
Negative	92	113	1	1
Positive	187	63	3.65 (2.45–5.42)	**4.76 (3.02–7.49) ***
Perceived susceptibility for HIV				
Low	111	103	1	1
High	168	73	2.14 (1.46–3.14)	**2.63 (1.63–4.24) ***

Variables	Preventive behaviors		COR	AOR
	Yes	No		
Perceived severity of HIV				
Low	115	103	1	1
High	162	73	1.99 (1.36–2.92)	1.50 (0.93–2.40)

Discussion

This study aimed to measure the magnitude of HIV preventive behaviors among mining workers. So, the study showed that 61.3% of respondents had good HIV preventive behaviors. The finding is higher than the study conducted among mining workers in Sali traditional gold mining site bench Maji zone, Southwest Ethiopia which showed only 47.6% of participants were engaged in HIV preventive behavior(23). This discrepancy might be because of the study conducted among Sali traditional gold mining was late when compared to the current study.

According to this study mining workers, those do not drink alcohol were more likely to practice HIV preventive behaviors than those drinking alcohol. Similarly, a study conducted on the effects of hazardous and harmful alcohol use on HIV incidence and sexual behavior showed that unsafe sex, partner violence, and HIV incidence were higher in women with alcohol users (24). The study conducted among college students in Gambella town also showed that alcohol drinkers are less likely to practice preventive behaviors than non-alcohol drinkers(22). Similarly, a study conducted on Alcohol use and HIV risk behaviors among rural adolescents in Khanh Hoa Province Viet Nam showed that alcohol use was significantly associated with engagement in sexual behaviors(25). Also, a study conducted in Jigawa State, Nigeria indicated that HIV/AIDS Knowledge was positively correlated with HIV preventive behaviors(26). This might be because workers who do not drink alcohol can control his emotions and activities since his mind relatively stable. In other way workers, that drinking alcohol can be influenced by others because of peer pressure and the effect of alcohol on their control.

Similarly, mining workers, those do not chew chat were more likely to practice HIV preventive behaviors than chat chewers. This might be because of chat chewers sit for a long time in a day and can be discussed on sexual matters as the result they may compete to have sexual intercourse.

Individuals those have comprehensive knowledge about HIV were more likely to practice HIV preventive behaviors than individual lack comprehensive knowledge about the disease. A study from Lao PDR on risk perceptions of STIs/HIV and sexual risk behaviors among sexually experienced adolescents showed that participants with good knowledge have risk perception of STIs/HIV which leads them to better prevention(27). Similarly, a study conducted on HIV/AIDS preventive behavior among college students in Gambella town, Southwest Ethiopia using the health belief model indicated that participants with good knowledge were more likely to practice HIV preventive behaviors than those with poor knowledge(22).

This might be because individuals with comprehensive knowledge protect themselves since they know how HIV can be transmitted and the effect of HIV on their life.

Also, mining workers, who have a favorable attitude about HIV prevention were more likely to practice HIV preventive behaviors than workers with an unfavorable attitude. This might be because of those individuals with favorable attitudes may have knowledge about the disease and can easily protect themselves from getting the disease.

In this study perceived susceptibility of the workers toward HIV determines their practice of HIV prevention. Participants who had high perceived susceptibility for HIV were more likely to practice preventive behaviors than respondents with low perceive. Similarly, a study conducted on the utilization of HIV/AIDS prevention methods among university students residing at a selected university campus showed that perceived susceptibility to HIV/AIDS showed a correlation with self-efficacy on condoms and their utilization(28). This is because when they know as they are susceptible, they can take preventive measures.

Limitation of the study

Social desirability bias may affect this study since the participants might hide some practices. Also the nature of cross sectional study do not show causalities.

Conclusion And Recommendation

HIV preventive behavior is low in the study area. HIV preventive behaviors were associated with alcohol drinking, chat chewing, knowledge related to HIV, attitude towards HIV prevention and perceived susceptibility for HIV. Increasing behavior of HIV preventive behaviours through BCC is the key intervention.

Declarations

Ethical consideration

Ethical approval was sought from the Research Ethics Committee (REC) of the College of Health Sciences of Mizan-Tepi University. And Supportive letter was obtained from the zones' health office. Written informed consent was obtained from the study participants after interviewers explained the objectives, purpose, risk, benefit, participants' right and confidentiality of the study.

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Authors' Contributions

Tadesse Nigussie drafted the manuscript. All authors were involved in the conception, design, acquisition of data, analysis, and interpretation of the results. Finally, all authors read and manuscript for publication.

Availability of data and materials

All data generated during and/or analyzed during the study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable

Competing interests

No competing of interests.

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Figures

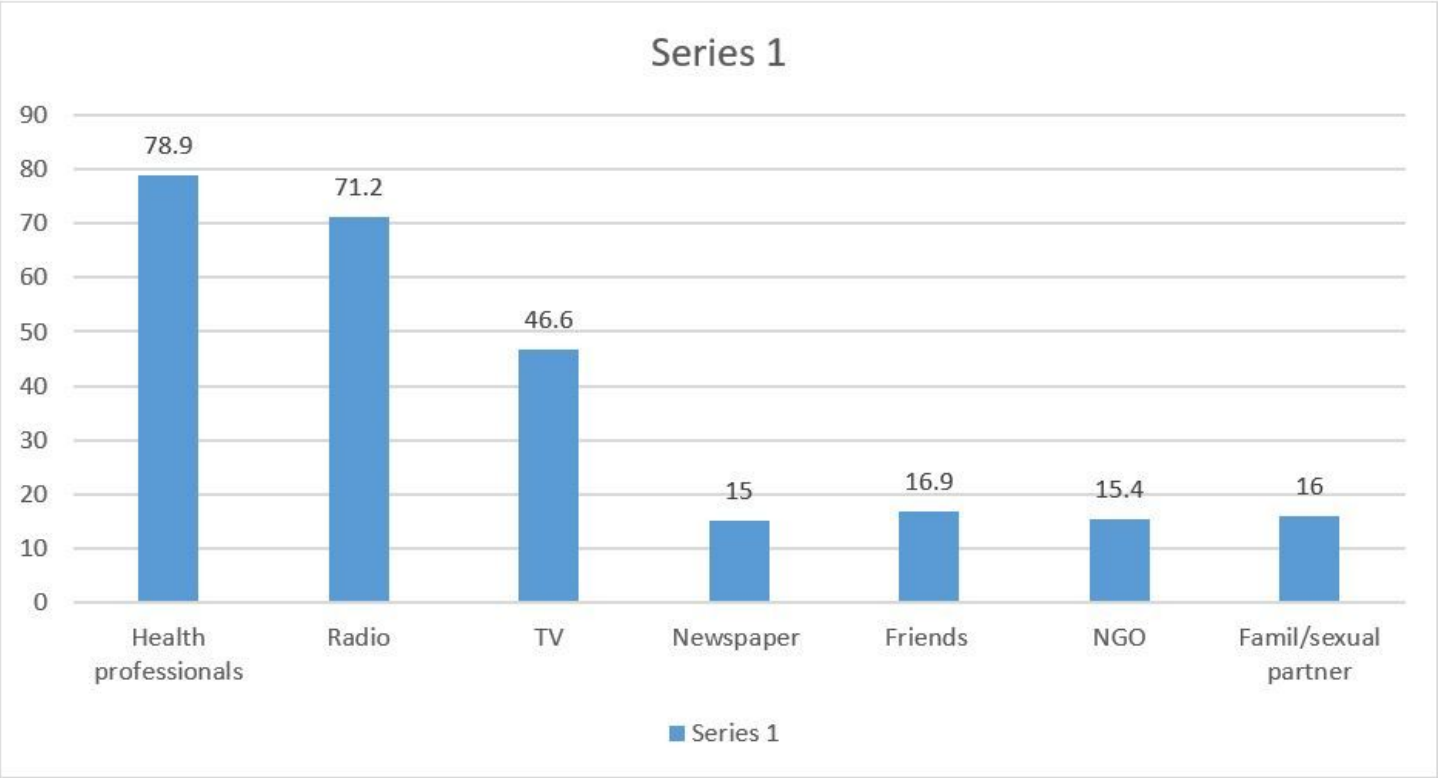

Figure 1

Sources of information about HIV and its prevention for mining workers in Dima district Gambella region southwest Ethiopia November 2019

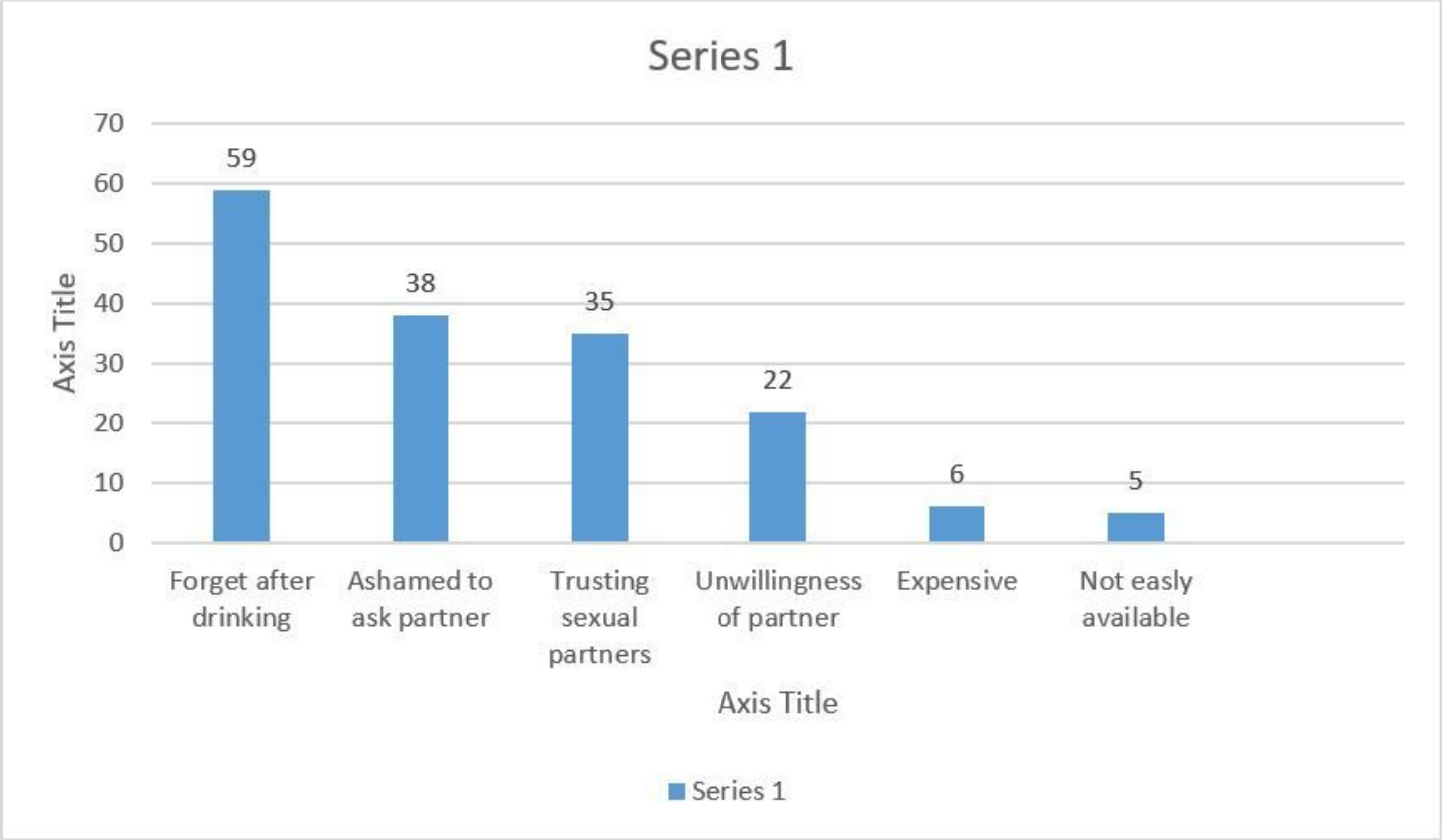

Figure 2

Reason of not using a condom consistently among mining workers in Dima district Gambella region southwest Ethiopia November 2019

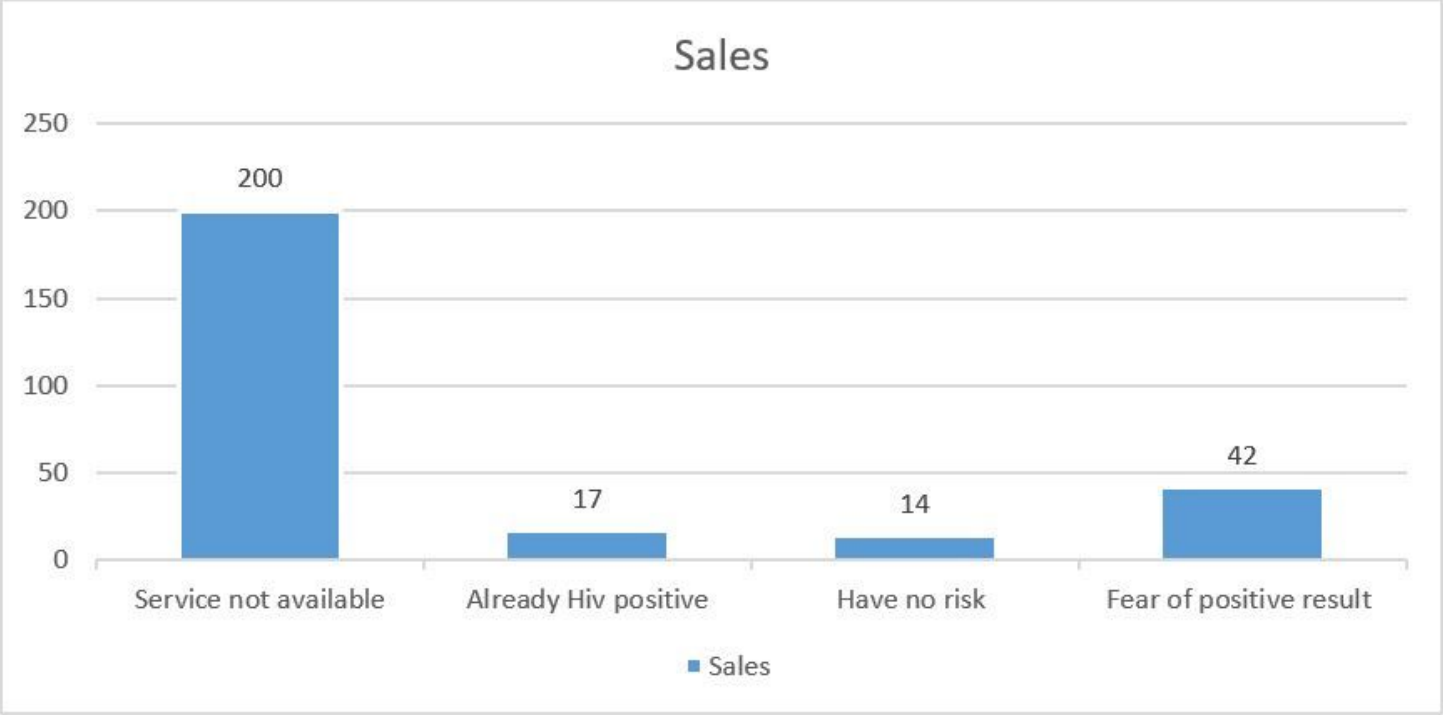

Figure 3

Reason of not undergoing HIV testing among mining workers in Dima district Gambella region southwest Ethiopia November 2019

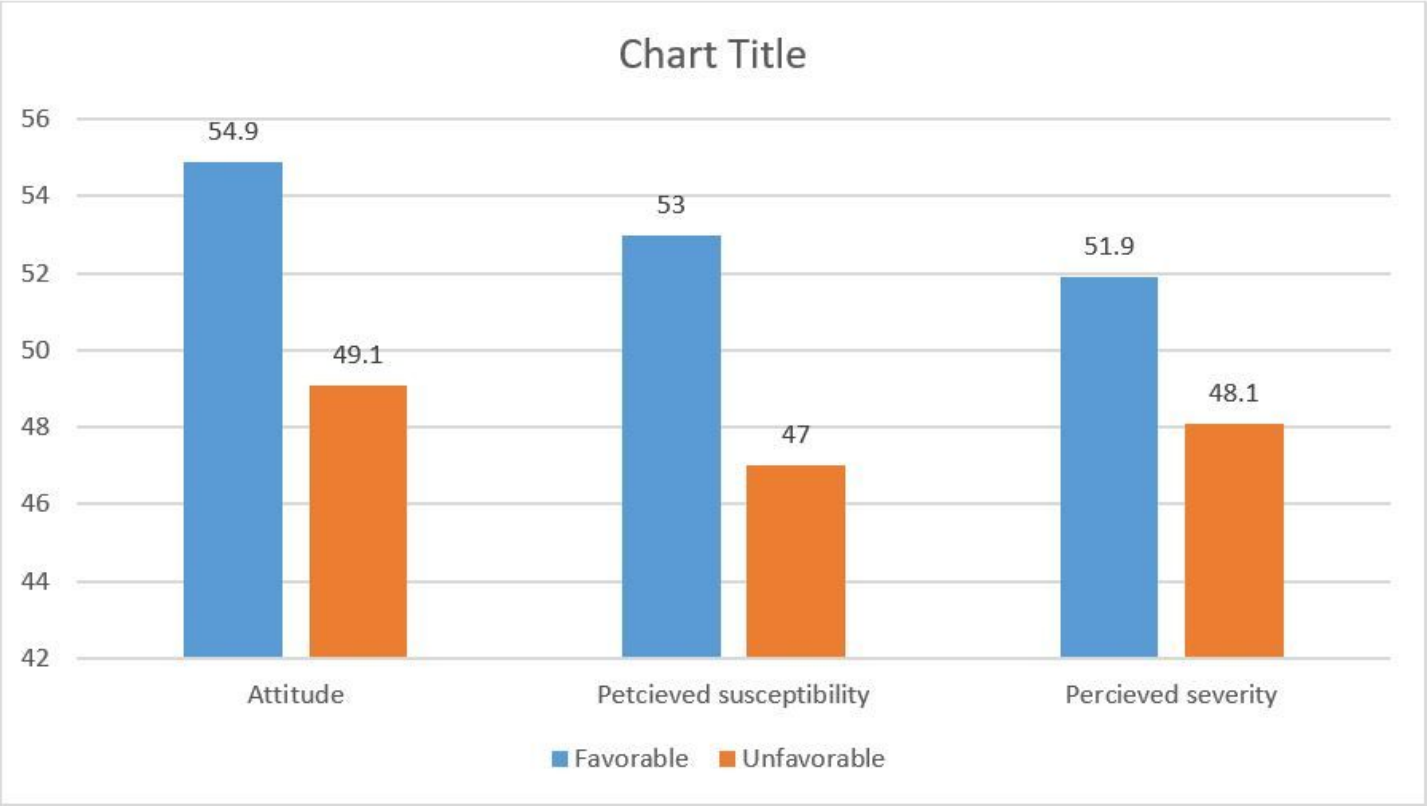

Figure 4

Perceptions towards HIV prevention among mining workers in Dima district Gambella region southwest Ethiopia November 2019