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Full Length Research Paper

Risky sexual behaviors and associated factors among high and preparatory school youth, East Wollega, Ethiopia, 2017: A cross-sectional study design

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Most of the sexual initiation and sexual practice of the youth begins at secondary school level. At this stage student assumed to be exposed to many risky sexual behaviors. However, little research had been explored in the Oromia region particularly in East Wollega zone on this area. A cross-sectional study design was used to assess risky sexual behavior and associated factors among high school and preparatory school students from 1st October 2016 till October 30, 2016. Data was collected using self-administered questionnaire. Focus group discussion was conducted to support the quantitative data. Probability proportionate to sample size (PPS) was used to determine the sample size for each grade 9-12. The data was coded and entered into a computer using SPSS version 16.0. Final model was fitted and P value less than 0.05 considered as statistical significance and independent predictor of risky sexual behavior. The results revealed that three hundred and twenty-four students participated in the study (response rate of 97.7%). In the past 12 months, 25.3% of students had sexual intercourse, 17.07% of them had more than one sexual partners and 11.9% of male students visited commercial sex workers. Family connectedness [AOR, 95%CI 0.73(0.67-0.89)], attitudes toward sex [AOR, 95%CI 1.22(1.04-1.43)], khat chewing [AOR, 95%CI 9.25(2.51-34.07)] and those that had been forced by classmates for sex [AOR, 95%CI 7.63(2.36-24.66)] were independent predictors of risky sexual behaviors. The study thus revealed that risky sexual behavior of school youth was increased by khat chewing, sexual coerciveness from classmates or teacher, positive attitudes toward sexual intercourse and reduced by high family connectedness alongside attending religious services regularly. In addition to parental connectedness and parental supervision intervention targeted on school youth like positive peer influence to encourage safer sexual behaviors among school youth is very important in reduction of risky sexual behaviors.

Key words: Associated factors, risky, school adolescent, sexual behaviors.

INTRODUCTION

Youth is the transition from childhood to adulthood. According to the United Nation/World Health Organization

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(UN/WHO), “Adolescents” include the age group between 10 and 19 years, “youth” includes the age group between 15 and 24 years and “young people” encompass both adolescents and youth which is the age group between 10 and 24 years (Deane and Reindeer, 2005). Risky sexual behavior is any behavior that increases the probability of negative consequences associated with sexual contact, sexually transmitted diseases (STD) including human immune virus/acquired immune deficiency syndrome (HIV/AIDS), abortion and unplanned pregnancy. Risk factors defined as any characteristics of individual, school, family and peers that make people exposed to negative consequences (WHO, 2001).

Worldwide, about six thousand people aged between 15 and 24 contract HIV per day and over the quarter of all the individual living with HIV were aged between 15 and 24 years with most of this age group enrolled in schools (UNAIDS, 2009). In Africa, reproductive health problems are associated with risky sexual behavior among youth and they are highly affected by sexually transmitted diseases like HIV/AIDS, gonorrhoea, syphilis and vaginal discharge. Lack of knowledge about family planning, sexual and reproductive health problems and transmission and prevention of these problems were other issues that predispose youths to these problems (Fatch et al., 2013). The sexual activities among male youth have significantly occurred in those living in low-cost housing, having divorced parents, substance (tobacco, alcohol, or drug) use, involvement in gang activities, permissive attitudes, lack of confidence in resisting peer pressure to engage in sex and lack of knowledge and attitudes regarding sexuality and sexual practices especially those at secondary schools (Mee-Lian et al., 2009; Victor et al., 2000).

In Ethiopia, people aged between 10 and 24 years represented one of the country's largest groups that is 35% of the total population (Mitike et al., 2002). Ethiopian demographic health survey (EDHS) of 2011 indicated HIV and sexually transmitted diseases (STDs) prevalence among the age group 15 to 24 was associated with risky sexual behaviors: having multiple sexual partners, early initiation of sexual intercourse and low condom use (Central Statistical Agency [Ethiopia] and ICF International, 2012). The study on risky sexual behaviors and predisposing factors among Ethiopian university students aged 15 to 24 years showed that out of 529 (40.2%) of the students who ever had sex, those that have experienced having at least one of the sign and symptoms of genitourinary tract infections such as whitish discharge from the penis or vagina were 184 (13.5%), burning sensation during urination were 128 (9.2%), foul smelling and yellowish vaginal discharge were 60 (5.1%), genital ulcers/sores by 46 (3.3%), swellings in groin area 44 (3.2%) and itching in the genital area by 67 (4.9%). The trend was somehow similar across the universities. In most of the students, the symptoms and signs were

experienced after starting sex (Lemessa, 2012). Even though different works have been carried out so far to combat the effect of risky sexual practice on the youths which mainly targeted on curative based intervention, the problem still remains a great challenge for developing countries including Ethiopia. Therefore, this study tried to give the present prevalence of risky sexual behavior and further investigate contributing factors that influence youth sexual behaviors among high school and preparatory students in East Wollega zone.

METHODS

Study design and sample collection

The study was conducted in Oromia Regional State, East Wollega Zone, Western Ethiopia from October 1 to 30, 2016. There are 12 preparatory and 30 high schools in the zone and are providing education services for 38,754 students of which 20,276 were males and 18,478 were females [East Wollega Zone, Education Office Report, 2013]. A cross-sectional study design was used. All high school and preparatory school students aged between 15-24 years attending their education daytime during study period and sampled students from specified grades were taken as source and study population, respectively. Regular daytime students aged between 15 and 24 years who were attending high and preparatory school during time of data collection and who volunteered to participate were included in the study and students who refused to fill the questionnaire and those absent during the data collection were excluded.

Sample size and sampling techniques

Sample size determination

Single population proportion formula was employed with the assumptions: the proportion of risky sexual behavior among school students of Addis Ababa was 10.6% (Amsale and Yemane, 2012); desired precision of 5%, 95% confidence level, 2 design effect, and 15% non-response rate were considered.

$$n = z \left(\frac{\alpha}{2} \right)^2 P(1 - P) / d^2$$

where z = the confidence limits of the survey result, P = the proportion of study population practicing risky sex, d = the desired precision of the estimate, n = the total sample size. With the aforementioned assumptions, the total sample size calculated was 335 students.

Sampling techniques

Quantitative: Multi-stage sampling technique was employed. Twelve high schools and preparatory schools in East Wollega zone were identified and listed. Four woreda were selected randomly and according to the WHO recommendation of facilities based sampling selection (30 - 40%) and four high and preparatory schools were selected using simple random sampling. Initially, students were stratified by grade and then lottery method technique was also employed to select section from each grade and computer

generated random number was used to select study units from the sections by using student's registration as sampling frame. The number of students included in the study from each selected schools were proportional to the total number of students in each selected schools.

Qualitative (FGD): Purposive sampling technique was used to select anti-HIV/AIDS and Women's clubs because those students who were member of these clubs would expect to have good information on the subject matter than others.

Study variables

Dependent variable

Risky sexual behaviors [having more one sexual partner, inconsistent condom use/not using condom during sex, sex with commercial sex worker and sex with causal partner].

Independent variables

- i) Socio-demographic characteristics [religion, age, sex, family educational, residence, ethnicity, parent occupation, grade level].
- ii) Family factors [family connectedness, parental monitoring, and parent adolescent communication].
- iii) School environment factors [teacher-student's relationship, classmate's relations].
- iv) Peer factors [partner influence for sexual intercourse, partner influence for substance use (alcohol, chat, and cigarette)].
- v) Individual factors [substance use (alcohol, chat, and cigarette), exposure to sexual film, attitudes toward sexual contact, having sexual partner, knowledge about risky sexual behavior].

Operational definitions

Consistent condom use: Using condom during each and every sexual intercourse. Respondents were asked about how they often use condom during sex [always, most of the time, some time, rarely and don't use]. Those students who used condom always during sex with non-regular partner were taken as consistent condom user.

Non-regular partner: Sexual partner out of marital union.

Risky sexual behavior: At least practices one of the following [having more than one sexual partner, inconsistent condom use while sex, sex with commercial sex workers, have sex with risky causal /unknown sexual partner].

Substance use: Those who use at least any one of the following substances: alcohol, khat, and cigarette.

Parental monitoring: When parents supervise their children, advice their children so as to prevent them from bad behaviors including risky sexual behaviors. There were 5 items yes/no and multiple choices to assess student's perception about their parent monitoring [high parental monitoring means those students perceived their parents know about them in detail including their sexual activities, low parental monitoring means those students perceived their parents did not know them in detail].

Parental communication: Communication between youth and parent about the sexual issues of the adolescents before the youth

initiated for sexual activities [5 items, yes/no and multiple answer questions].

Family connectedness: Parent's attachment to their children [high total score indicated high family connectedness, low total score indicated low family connectedness].

Peer influence: Pressure from peers to practice sexual intercourse or use substance (khat, alcohol, or cigarette) which intensify risky sexual practices [No pressure, some pressure, a lot of pressure]. Those who had some and a lot of pressure from peers are categorized as those who had peer influence.

School environment: The environment in which there is relationship between student-teachers and among students/classmates that promotes risky sexual behaviors.

Enforced sex/coercive sex/non-consensual sex: Sexual intercourse which was not depending on the agreement of the two partners or one partner enforces the other.

Attitudes toward sexual contact: The readiness of the students for sexual initiations. There were three 5-point Likert type questions treated as continuous and score runs from 3 to 15 [as score approaches to 15, it indicated favorable attitude and as the score approaches to 3, it indicated unfavorable attitudes].

Verbal harassment: She/He threaten verbally because of refusing sexual activities (insulting or offensive words)

Instrument and measurement

Tools were adapted from previously done similar risky sexual behavior studies and data collection instrument contains five dimensions.

Individual factors: [Substance use (3 items yes/no and 6 items multiple choice questions), knowledge (4 items multiple choice answers questions), attitude toward sex (3 items with 5 point Likert scale question)]. Attitude Likert type questions were treated as continuous variable after summed total score.

Peer influence factors: [Peer influence (4 items yes/no question) and perceived peer involvement on substance use and sexual behavior (5 items multiple choice question)].

School environment: Relationship between male teachers and female students, between classmates (9 items multiple choice questions and 2 items yes/no questions) to assess sexual coercive especially on female students in the school compound.

Family Environment factors: [Family connectedness (6 items with 5 point Likert scale), family monitoring (2 items yes/no and 2 items multiples answer question) and adolescent parent communication on sexual issues (1 item yes/no and 4 items multiple answer question)]. The Likert scale data summed and the total score treated as continuous variable for further analysis.

Risky sexual practice: 19 items were used in general to assess sexual experience and risky sexual behavior is composite variable which was created from at least one of inconsistent condom use and having more than sexual partners. The content validity of the questionnaire was assured by the experts (advisors) and the internal reliability of Likert scale items were checked through Cronbach's alpha which was greater than 0.70.

Data collection procedures

Quantitative

A pretested, structured and translated questionnaires adapted from various sexual risky behavior studies (Lemessa, 2012; Kanako et al., 2008, 2009; Gurmesa et al., 2012; Lemessa et al., 2012) was used to collect the data. The questionnaire was originally developed in English and then translated into Afaan Oromo. Four diploma holder data collectors and one-degree holder health professional's supervisor were recruited to facilitate data collections.

Qualitative

Four focus group discussions (FGDs) disaggregated by sex was conducted using discussion guide in order to provide more insight into complex pattern of sexual behavior among school youths. Furthermore, two male's groups, first group consisting of 10 males and the second male group was consisting of 8 members; and the first female group consists of 7 members and the second female groups consists of 9 members were organized for FGDs. Male data collectors were moderate in the discussion for the male groups; while the female facilitators 'was moderate for the female FGD groups.

Data processing and analysis

Quantitative

Data was checked for completeness, consistency, entered into computer and then analyzed using SPSS program version 16.0. Summary result was presented using frequency table, graphs, and cross tabulation. Binary logistic regression analysis was carried out to identify variables with p-value less than 0.25 for multiple logistic regressions. P-value less than 0.05 was considered as statistical significance and independent predictor of risky sexual behavior.

Qualitative

The qualitative data was analyzed into thematic areas and then it was triangulated with quantitative findings.

Data quality assurance

Quantitative

Intensive two-day training was given for both data collectors and supervisors by the principal investigator before data collections. The prepared questionnaire was pre-tested on 5% of sample size in Gute High School which was not included in the study to see the language clarity and sequence of question. During data collection, data was checked for completeness, accuracy, and consistency by supervisors and principal investigator after the data collection on daily base. Descriptive analysis carried out to see outliers, missing values and inconsistency.

Qualitative

Qualitative focus group discussion was conducted by trained professionals. Guideline was prepared and numbers of note taker

were two per group because the FGD discussants were not volunteered for audio taped.

Ethical considerations

The study protocol was approved by Ethical Clearance Committee of Jimma University College of Public Health and Medical Sciences. Permission letter was obtained from East Wollega Zone Education Office. An official letter of cooperation was written to Woreda Education Office and then cooperation letter was written to respective schools. The purpose and procedure of the study were communicated to the participants, and informed consent was obtained from the school and from each participant. In order to protect confidentiality, names or school IDs were not included on the written self-administered questionnaires. Identification of an informant was only possible through numerical codes.

RESULTS

From the total of 335 students who were identified for the study from four high and preparatory schools of East Wollega zone, 324 participated in the study yielding the response rate of 97.7%. The widely held of the respondents were from grade nine 142 (43.8%) followed by grade ten 116 (35.8%). One hundred and seventy-eights (54.9%) of study subjects were males and all of the students were single in marital status. About half of the respondents 156 (48.1%) were followers of protestant followed by orthodox 132 (40.7%). Majority 299 (92.3%) of the respondents were Oromo by the ethnic group followed by the Amhara 24 (7.4%). More than half (57.4%) of the respondents were from rural residential. As the descriptive study indicates, respondent mother's educational were illiterate (52.8%) and 33.3% respondents fathers educational status were only read and write.

About one-third 32.4% of the students reported as they communicated with their family about reproductive health and sexual issues of which the majority 49 (46.7%) of the students prefer mother to discuss on the sexual issues. The major reasons for not discussing sexual issues with family were culturally not acceptable and shame as reported by 55 (25%) and 77 (35%) of the students, respectively.

The majority of the respondents 228 (70.4%) reported that as their parents knew their close friends, of which 106 (46.5%) of the participants perceived that all of their parents knew their close friends, 90 (39.5%) of the participants reported that some of their parents knew their close friends and only 32 (14%) respondents reported that few of their parents knew their close friends. Of the total respondents, more than half 189 (58.3%) respondents perceived that their parent did not know their activities in detail including their sexual experience when they were not at home.

Half 165 (50.9%) of students of which 84 (51%) are males and 81 (49%) are females reported that they had

pressure from their peer group to involve in the sexual activities prior to the research and it was supported by focused group discussion, with discussants explaining that peer can influence each other on the sexual behavior, especially peers of similar age group could influence each other towards their own behavior. A 23 years old student described that:

"If I tell you with a simple example, she/he may have a friend who has sexual experience, then her/his friend most of the time talk to her/him about his/her sexual behavior. As the time goes, she/he has a high probability to share the behavior of her/his friend" Male participant.

Descriptive analysis result 49.3, 32.7 and 18.9% of the respondents reported that their peer group drinks alcohol, chewing khat and smoking cigarette, respectively. Of this, 33.3, 18.2 and 8.6% of the students reported that they had pressure from their peer group to drink alcohol, chewing khat and smoking cigarette, respectively. This finding was triangulated with focused group discussion, as participants across the groups described having friends smoking cigarette, drinking alcohol and chewing khat; thus, they have a chance to involve in such activities because of peer influence to have their own behaviors.

Among all female respondents, 32 (9.9%) reported that they had high pressure for sexual intercourse from their male teachers of which 5 (15.6%), 10 (31.3%) and 16 (53.1%) female respondents were raped, practiced voluntary sex and experienced verbal harassment, respectively. To pass the exam because of low academic performance, gift or money and false promising for marriage were the main reasons for this sexual act. From those who had sexual intercourse, the most of them (86.6%), female respondents reported that they kept practicing unprotected sexual intercourse with their male teachers. From the total 324 respondents, 67 (20.7%) students reported that they were enforced for sex by classmates of which 32 (47.8%), 14 (20.8%) and 21 (31.3%) of respondents reported that they were at risk of verbal harassment, raped and had voluntary sexual practice with their classmates, respectively.

Descriptive analysis indicated that 64 (19.8%), 41 (12.7%) and 20 (6.2%) of students reported that they drink alcohol, chewing khat and smoking cigarette, correspondingly. Of which 42, 48.8 and 35%, respectively were those who use alcohol, khat and cigarette in the last two months and 12 months for those who participated in risky sexual practices.

Of total, 275 (84.9%) of the participants heard about the sexual health problem from which 60 (21.8%) of study subjects classified it as: sexually transmitted diseases, unwanted pregnancy, abortion and fistula. Regarding ways of preventing these problems, 151 (46.6%), 58 (17.9%) and 55 (17%) of study subjects reported that

abstinence, use of condoms and being faithful are ways to reduce the risky sexual behaviors, respectively. Of the total respondents, 139 (42.9%) students watched or read films or magazines that mainly focus on sex and 61 (18.8%) of the respondents had a sexual partner.

Almost all (99.4%) of the respondents responded to the attitudes related to risky sexual behavior questions. The mean score of attitudes related to risky sexual behavior of respondents was 8.69 ± 3.558 standard deviation (SD) with a median score of 9.00. The t-test indicated that, there was a mean difference between students who were monitored by parents and those free from parental monitoring have positive attitudes toward sex and statistically significant ($t=-2.539$, $DF=320$, $p=0.012$).

About quarter 82 (25.3%) of students reported that they ever had sexual intercourse of which 42 (12.96%) and 40 (12.04%) were males and females, respectively prior to the study. This finding was supported by the qualitative study which discussants from all groups stated that even though premarital sex has negative consequences, many high school adolescents had premarital sex and one participant from the group stated that:

"... today having a boy/girl friend at this age looks as a fashion/seen as a sigh of modernizing among school adolescents. But I think this prevents us from achieving our plan because as dating becomes normal premarital sex comes through the process." Male age 16

The minimum and maximum age of sexual debut for males was 14 and 20 years and that of females was 12 and 20 years. The mean age at first sexual intercourse was 16.1 ± 1.51 years (16.31 ± 1.585 for males and 15.9 ± 1.429 for females). There was no statistical mean difference between male and female respondents that ever started sexual intercourse ($t=1.230$, $DF=79.766$, $p=0.222$). Among those adolescents who had sexual intercourse, the majority (85.4%) of the students had their first sexual intercourse in at age between 16 to 19 years.

Of respondents who had sexual intercourse, more than half (59.75%) of the students reported that they had sex with their friends. Personal desire and peer pressure were the most common reasons to start the first sexual intercourse reported by 31 (37.80%) and 25 (30.48%) of sexually active students respectively.

Promising for marriage, money or gift from a partner and for passing exam were the other reasons to start first sexual intercourse reported by 12 (14.63%), 6 (7.31%) and 7 (8.54%) of students, respectively. This finding is complemented by FGD, participants stated that risky sexual behavior of some female high school adolescents were related to finance. Some students were financially insecure and they need money/other gifts from their sexual partner. As a result, during sexual intercourse they fail to negotiate their partner to use condom, thus they practiced unsafe sex.

Twenty-four (29.26%) of the students reported that they had experienced forced sexual intercourse or enforced someone to be involved in the sexual activities. This finding was similar to result from the focused group discussion in which some participants described that sexual activities among school adolescent mainly focus on getting pleasure form sex or to satisfy their body needs and one female participant from the group said that:

“... I think, most of the time, they are males that enforce girls to have sexual intercourse to satisfy only their body needs without understanding the consequences that comes behind” Female age 17.

The study subjects (5.6%) complained of signs and symptoms of STDs like ulceration or discharges from their genital organ after starting sexual intercourse. Of those female respondents who had sexual intercourse in the past, 15 (37.5%) and 3 (7.5%) reported that they were pregnant one time and more than one times, respectively. This was also supported by the qualitative finding that the majority of the discussants of FGD groups expressed that the major reproductive health problem of school adolescents was unwanted pregnancy with subsequent consequences; as a result many student default from the school and migrate to town to be commercial sex workers and search for other activities.

From those who had sex in the past 12 months, the majority 53 (79.10%) of them reported that they had one sexual partner of which 28 (52.8%) and 25 (47.2%) of the students were male and female respectively. Of those who had sex in the previous 12 months, 14 (17.07%) of the students reported that they had more than one sexual partner. The minimum and maximum numbers of sexual partners of both sexes were 1 and 4, respectively. The average numbers of partners for sexes (per respondent) in the past 12 months was 1.25 ± 0.531 (median=1). The mean numbers of partners 1.23 ± 0.490 (median=1) and 1.28 ± 0.581 (median=1) for males and females respectively. From these, we can observe that female respondents had a high number of sexual partners more likely than their male counterparts but there was no statistically significant difference between the male and female respondents ($t=-0.402$, (DF)=65, $p=0.689$).

Commercial sex partners were assessed by asking the male respondents whether or not they had sexual intercourse with a commercial sex worker. Of those male respondents who had sexual intercourse in the past 12 months, 5 (11.9%) male respondents reported that they had sexual intercourse with commercial sex workers of which no male respondents used condom all these period. From these we can observe that male students who had sex with commercial sex partners were at risk of contracting sexually transmitted diseases and are exposed to different social and psychological problems.

Condom use was assessed and recorded in a way that a respondent or their partners use condoms always with all except marital partner. From those who had sexual intercourse, only 12 (14.6%) used condom consistently in the past 12 months. But only 25 (30.5%) had used condoms in the first time they had sexual intercourse of which 18 (72%) and 7 (28%) were respondent's male and female, respectively. Figure 1 was also supported by qualitative study that most of FGD discussants across the group however agreed to use of condom during sexual intercourse; most of sexual intercourse practiced among the school adolescents were unprotected and some participants described that most adolescents think that condom prevent satisfaction during sex and according to their ideas, school adolescents choose sex without a condom than use it.

Of those who ever had sexual intercourse, 12 (24%) of students of which 8 (66.7%) males and 4 (33.3%) females reported that they used condom all the time during sexual intercourse in past and 63.6% of male and 36.4% of females reported that they used condom most of the time; 16 (32%) of students of which (37.5% of males and 62.5% of females) used condom sometimes during sexual contact in the past 12 months and 42 (62.68%) of students reported that they did not use condom in their most recent sexual encounters. Twenty-one (30%), 14 (20%) and 13 (18.57%) of students reported their main reason for non-use of condom were being in love with a partner, could not find condom and trusted partner, respectively. This finding was supported by the focus group discussion which some discussants of the group described that school environment was not conducive to reduce risky sexual behaviors. Even if the person assigned in the school compound for counseling those adolescents at risk of these problems, the confidentiality of the issue was not guaranteed:

“I think unavailability of condom is another issue that aggravates risky sexual intercourse. There is no safe place for condom distribution. Even if some students have interest to use condom, they were afraid go to private clinics/pharmacy, health center or other places to buy or ask condom. This is another challenge for condom utilization. So for this issue, I recommend that it is better if a condom is placed in a safe place that keeps privacy of adolescents” Male age 20.

Overall, 76 (23.5%) of the study participants were involved in the risky sexual behaviors in the previous 12 months prior to the study.

Family connectedness was a protective factor and per unit increases in the total score of family connectedness, the odds of becoming involved in risky sexual behavior reduced by 0.73 and the observed difference was statistically significant [AOR, 95%CI 0.73(0.63-0.83)]. This finding is supported by focus group discussion as

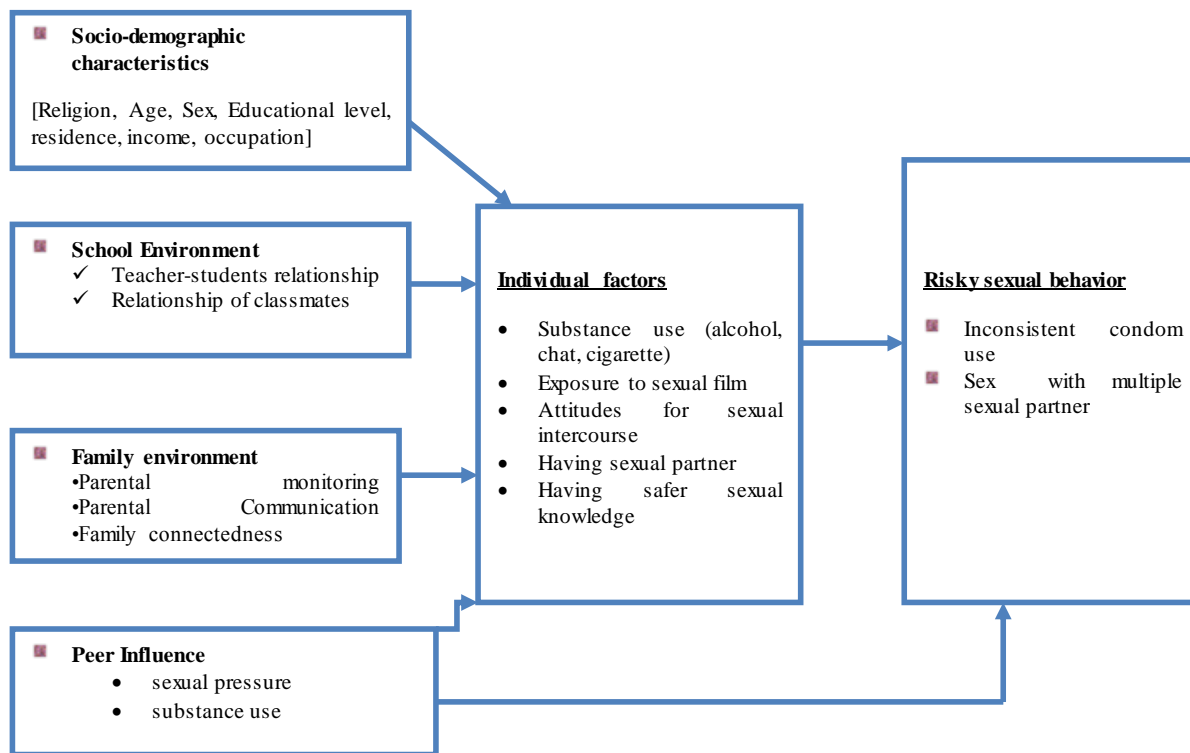


Figure 1. Conceptual frame work on risk sexual behavior and associated factors among high school and preparatory students, in East Wollega zone, January 2017.
Source: Social Development Model.

most participants agreed to the importance of family monitoring and connectedness on reduction of risky sexual behavior of adolescents. Participants in the group described that family who strictly monitor/follow their children, openly and freely communicate with their children on how to resist peer influence on bad behaviors, and families who show signs of love to their children helped to protect their child from negative peer influences.

Students who had been forced for sex with their classmates were 7.57 times more likely involved in risky sexual behavior than their counterparts [AOR, 95%CI: 7.57 (2.69-21.28)] and students who used khat in the previous three months were 4.35 times more likely to have experienced risky sexual behavior as compared to non-users in the past three months [AOR, 95%CI: 4.35 (1.23-15.42)]. This finding agrees with the qualitative result which some discussants described that when someone use substances like alcohol, khat, and cigarette, the chemical of these substances disturb the mental thinking process of human being. At that time, she/he may out of control and involved in the risky sexual behavior including sex without condom.

Attitudes toward sexual intercourse were positively associated with risky sexual behaviors and per unit

increases in the total scores of attitudes toward sexual contact, the odds of becoming at risk of sexual behavior increased by 1.22 and it was statistically significant [AOR, 95%CI: 1.22 (1.04-1.43)]. Students who attended religious services per week were 3.37 times more likely participating in risky sexual behavior than those who attended religious services regularly [AOR, 95%CI: 3.4 (1.20-9.49)] (Table 1).

DISCUSSION

This study tried to see the association of risky sexual behavior with demographic factors, family environment factors, school environment factors, peer factors and individual factors. The finding of this study revealed that about one in four high school and preparatory school youths had sexual intercourse. This implies that many students were sexually active prior to the study. However, finding of this study is consistent with similar studies conducted among high school students in Nekemte town, Ethiopia (Tesfaye and Abulie, 2013) and slightly lower than study in Nairobi, Kenya and much lower than the study conducted in Hosanna, Southern Ethiopia and the Lema, Peru (Fatch et al., 2013; Caroline and Pamela,

Table 1. Independent predictors of risky sexual behavior among study population, 2017.

Variable	Risky sexual behavior		COR (95% CI)	P- value	AOR (95% CI)	P-value	
	No [%]	Yes [%]					
Model I Demographic characteristics							
Family income			1.73 [1.0-2.99]	0.051	2.20 [1.03-4.69]	0.042	
Grade level category	High school	65 [25.2]	193 [74.8]	0.59 [0.29-1.20]	0.148	1.75 [1.00-3.05]	0.048
	Preparatory	11 [16.7]	55 [83.3]	1.00		1.00	
Model II Peer factors							
Having friends who had sexual intercourse?	None of them	20 [16.7]	100 [83.3]	1.00		1.00	
	Few of them	18 [21.4]	66 [78.6]	1.36 [0.67-2.77]	0.391	1.03 [0.49-2.16]	0.948
	Most of them	29 [35.8]	52 [64.2]	2.79 [1.44-5.40]	0.002	2.21 [1.04-4.69]	0.040
	No female friends	9 [23.7]	29 [76.3]	1.55 [0.64-3.77]	0.333	1.28 [0.51-3.22]	0.604
Model III School Environment							
Did your male teacher enforce you for sex? (female respondents)	Yes	18 [56.20]	14 [43.80]	5.19 [2.44-11.04]	<.001	3.68 [1.49-9.07]	0.005
	No	58 [19.90]	234 [80.10]	1.00		1.00	
Did your classmates enforce you for sex?	Yes	37 [55.20]	30 [44.80]	6.89 [3.82-12.44]	<0.001	5.13 [2.68-9.90]	<0.001
	No	39 [15.20]	218 [84.80]	1.00		1.00	
Model IV Family environments							
Family connectedness			0.80[0.74-0.87]	<0.001	0.78 [0.71-0.87]	<0.001	
The Final (Model V) when individual factors was added							
Did your male teacher enforce you for sex? (female respondents)	Yes	18 [56.2]	14 [43.8]	5.19 [2.44-11.04]	<0.001	5.31 [1.48-19.05]	0.01
	No	58 [19.9]	234 [80.1]	1.00		1.00	
Enforced for sex by classmates?	Yes	37 [55.2]	30 [44.8]	6.89[3.82-12.44]	<0.001	8.23[3.01-22.49]	<0.001*
	No	39 [15.2]	218 [84.8]	1.00		1.00	
Family connectedness			0.804 [0.741-0.872]	<0.001	0.73 [0.63-0.83]	<0.001*	
Used khat in the past three months?	Yes	20 [48.80]	21 [51.20]	3.86[1.96-7.61]	<0.001	4.35 [1.23-15.42]	0.023*
	No	56 [19.8]	227 [80.20]	1.00		1.00	

Table 1. Contd.

	Everyday	17 [11.3]	134 [88.7]	1.00		1.00	
Attend religious services	One/Weeks	32 [26.0]	91 [74.0]	2.77 [1.45-5.29]	0.002	3.37 [1.20-9.49]	0.021*
	One/Months	11 [42.3]	15 [57.7]	5.78 [2.29-14.61]	<0.001	1.32 [0.22-8.04]	0.764
	One/Year	11 [73.3]	4 [26.7]	21.7 [6.21-75.71]	<0.001	6.32 [0.82-48.95]	0.078
	Never attend	5 [55.6]	4 [44.4]	9.85 [2.41-40.28]	0.001	9.71 [0.81-117.50]	0.073
Attitudes toward sexual behavior				1.28 [1.17-1.39]	<0.001	1.25 [1.08-1.45]	0.003*

*Statically significant association and independent predictor of risky sexual behavior.

2008; Likawunt and Mulugeta, 2012). This discrepancy of finding might be attributed due to different sample size of study subjects, geographical difference, time variation and there might be underreporting and over reporting of responses, that is, there might be respondents that conceal the fact that they are shy and unable to disclose their sexual contact to interviewers.

In Ethiopia, many literatures showed that school youths engaged in the sexual activities of which the majority was unsafe sexual intercourse (Adeoye et al., 2012; Gurmesa et al., 2012). This study also found that 23.5% of the students were involved in risky sexual behaviors prior to the survey. This study finding is higher than the previous study done in Addis Ababa among school youths and much higher than the study done among in-school adolescents at national level of Ethiopia (Amsale and Yemane, 2012; Derege et al., 2005). The higher result might be due to knowledge gap related to sexual issues including condom use and reproductive health problems between the subject of the study area and previous studies. The other reason might be widespread notion that having a sexual partner seen is a sign of modernizing. Furthermore, this study also revealed that 17% of students had more than one sexual partner. This finding is

almost comparable with previous studies (Melisew, 2008; Bereket et al., 2013); however, these findings were lower than the previous studies (Bo et al., 2007; Adeoye et al., 2012; Amsale and Yemane, 2012; Amon et al., 2011). In general, those who had more than one sexual partner were at risk of contracting disease like sexually transmitted diseases, HIV/AIDS and these groups are the main focus area of the research and needs immediate attention from a responsible body. The possible explanation of the difference might be the study area being more rural than the previous studies.

In Ethiopia, condom is one of the strategies for preventing sexually transmitted diseases including HIV prevention program. However, prevalence of condom uses especially among youths is still very low despite the efforts made so far to improve the utilization (UNAIDS, 2008, 2009; Nyovani et al., 2002; Tariku et al., 2012; Lemessa et al., 2012). This study showed that only 14% of sexually active students used condom consistently with non-regular partner prior to the study. From these figure 2 we concluded that majority of sexually active students practicing unprotected sex is much lower than the previous studies conducted in Jimma University (69.1%), in Addis Ababa city (43.4%) and in four districts in Tanzania (Bo et al.,

2007; Amsale and Yemane, 2012; Amon et al., 2011) and it is also a little lower than the study conducted in Hosanna, Southern Ethiopia (80%) (Likawunt and Mulugeta, 2012). This lower finding might be the knowledge gaps to utilize condom among the youths in this study area and the other reason might be misunderstanding of condom among school youths, that is, condom itself transmit diseases and it prevents satisfaction during sex. From this we could observe that most sexual active school youths experience unsafe sexual activities which expose them to risks. The reasons that prevent them from using condoms were not persuasive enough and it is important to prevent themselves from the negative impact of risky sexual activities and consequent reproductive health problems. In this study, 11.9% of male students had sex with commercial sex workers in the 12 past months. This finding is comparable with the previous study done among students of the Wolaita Sodo University (13.9%) and study in North West Ethiopia (7.8%) but a little lower than the previous studies conducted among secondary schools in Ethiopia (25.3%) (Bereket et al., 2013; Adamu et al., 2003; Yohannis and Alemayehu, 2002) and this study also shows that none of the students who had sex with commercial sex workers use condom

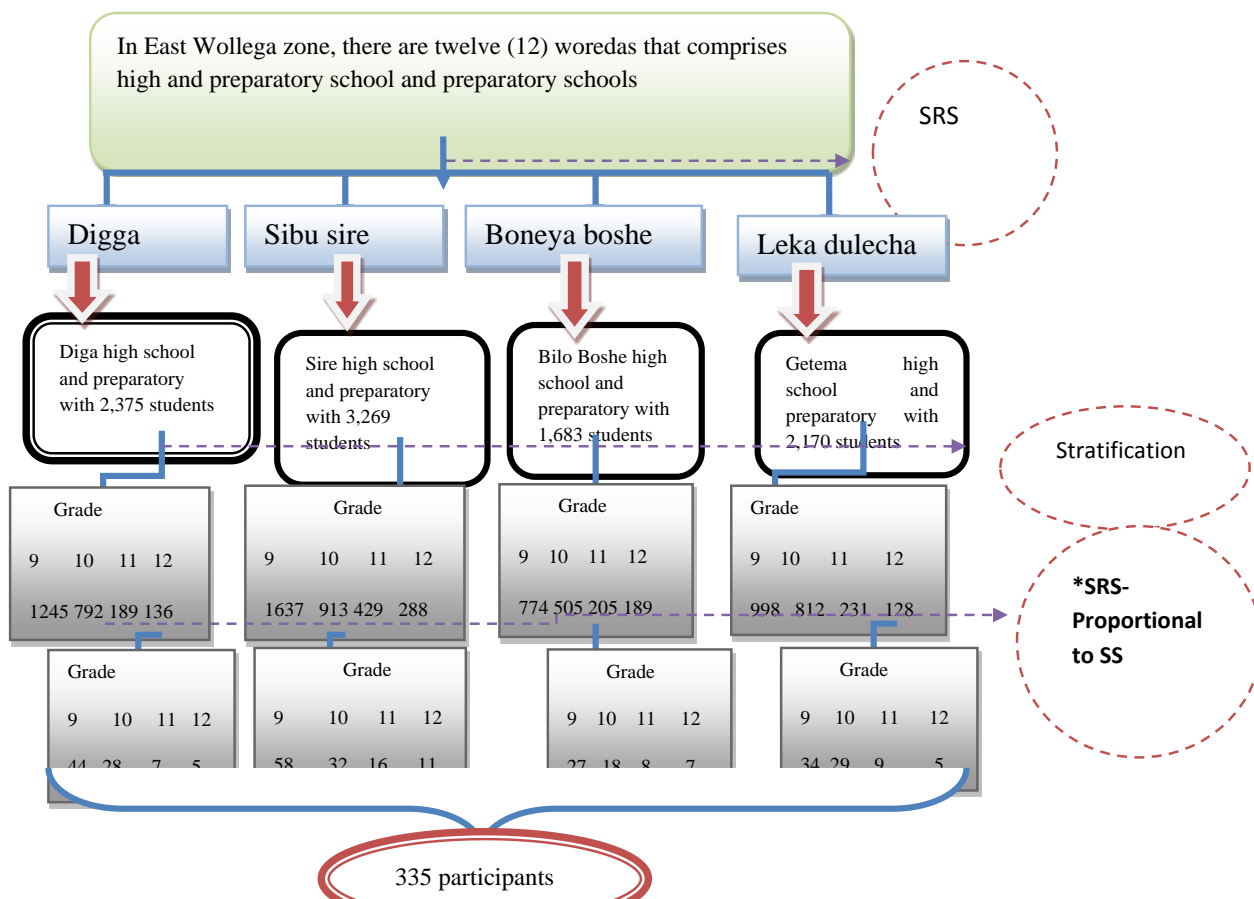


Figure 2. Schematic presentation of the sampling procedure used in the study risky sexual behavior and associated factors among high and preparatory school youth in East Wollega Zone, January, 2017

consistently which expose them to sexually transmitted problems. Since students are the generation who take responsibility and will have a great role in the growth and development of the country, the responsible body will need to alleviate this problem as soon as possible.

Among the 324 subjects, alcohol and khat were the most used substances among the students. Even though alcohol was the more frequently reported substance, it was not associated with risky sexual behavior but khat chewing was significantly associated, and those who chew khat were 4.35 times more likely to practice risky sexual behavior than those non users. This finding is consistent with previous studies in Ethiopia which revealed that school youths who used khat daily were 2.26 times more likely practicing unprotected sex than non-users. This finding is also supported by Expectancy theory which mainly focuses on the importance of internalized cultural and social expectation about the effect of substances on the sexual behavior. In this theory, the individuals' expectation that substance use lowers sexual inhibitions and/or enhances sexual pleasure moderates its relationships to sexual behavior,

making sexual behavior under the influence more likely and more risky as such expectation increases. However, in contrast with study done in Hosanna, Southern Ethiopia, among health college students, khat was not significantly associated with risky sexual behavior (Likawunt and Mulugeta, 2012; Derege et al., 2005; Brooke et al., 2011). The possible explanations for this discrepancy might be confounding factors controlled or might be sample size of study subjects.

In this study, having positive attitude toward sex increased the odds of risky sexual behavior and one-unit increase in the total score of attitude toward sex increased the odds of risky sexual behavior by 1.22. This finding is comparable with the previous studies. Among Kenyan school youths, those who had a positive attitude toward sex were less conservative to use condom and in China among school youths, those who had positive attitudes toward premarital sex, had sex more likely than those who had an unfavorable attitude toward premarital sex (Joy et al., 2009; Sunday et al., 2010).

In this study, family connection was a protective factor from risky sexual behavior. As one unit increased, the

total score of family connection decreased the odds of risky sexual behavior by 0.77 and this finding is consistent with the study done in Jimma Zone; family connection was protective factors and one unit increase of family connection decreased the odds of risky sexual behavior by 0.94. As reported by WHO report, family connection or love is one of the important bearing dimensions of youth health; also, another study in Houston, Texas indicated students higher score on a scale of perceived family connectedness, decreased the odds of having had unprotected sex by 0.97 (Abebe et al., 2013; World Health Organization, 2007; Christine et al., 2003).

Attending religious services were a protective factor from youth risky sexual behavior. This study is consistent with the study done in Jamaica among school youths which indicated that attendance of religious services was the most protective factor of risky sexual behavior (Lemessa et al., 2012).

Programs that targeted behavior change of school youth towards healthy sexual behavior were incorporated in the school curriculum to promote safer sexual behavior of school youths. So, establishing and promoting peer education program in school to make positive influence of peers around the school compound is crucial and very important in changing the risky sexual behavior of school youths to sustain the life of future generation. Generally, encouraging safe sexual behavior was one of the strategies to prevent sexually related problems like HIV/AIDS and ensuring good relation among students and student-teacher can encourage sexual risky behavior reduction.

Conclusion

This study identified substance use [chewing khat], attitudes toward sexual contact and influences for sexual activities from classmates as risky factors for risky sexual behavior whereas family connectedness and attending of religious services were protective factors and independent predictors for risky sexual behavior of school adolescents.

Sexuality was a sensitive issue and the respondents may over report or underreport their experience. As a result, tendency to give false information may be a limitation to this study. Recall bias may be introduced because the study asked for the past experience of the respondents and social desirability was a limitation of this study.

RECOMMENDATION

Family should be showing signs of love to their children and family connectedness to their children should be

strengthened and well promoted. Youth organization should lead out in reducing risky sexual behavior, promoting sports and recreational activities, discouraging substance use like alcohol consumption and smoking cigarette.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Proper utilization of long lasting treated net and associated factors at Zuway Dugda district, Arsi zone, Ethiopia

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Insecticide-treated net is one of the main malaria control strategies reducing its incidence by half. This study measured proper utilization of insecticide-treated nets in the study area. To assess proper utilization of insecticide treated net and determinants among households of Zuway Dugda district, Ethiopia. Community based cross-sectional multistage study conducted using structured questionnaire via interview and observation. The collected data entered into EPI INFO Version -7 and analyzed using SPSS version 21 software. Variables having $p < 0.2$ in the bi variate logistic regression were entered into multi variable logistic regression analysis and finally $p < 0.05$ considered to declare association. Among study population 84.2% of 821 households had at least one ITNs, while only 18% used it the night proceeding the data collection day. Educational status, having separate sleeping room, frequency of using ITNs, ITNs ever been washed and shape preference of respondents were associated factors for utilization. Although ownership was moderate, only small proportion of household members slept at least under one ITN. Improving housing condition, when to wash ITNs and benefit of washing and education coverage for the community also needed.

Key words: Households, insecticide treated net, ownership, utilization.

INTRODUCTION

Malaria is a protozoan disease transmitted to man by the bite of the female anopheles mosquito (Tizazu et.al, 2006). It remains an important cause of illness and death in children and adults in malaria endemic countries (WHO, 2015a). Globally, 3.3 billion people in 97 countries and territories are estimate to be at risk of being infected with malaria and developing the disease (WHO, 2015b).

It is estimated that 190–330 million malaria episodes and at least 1 million malaria deaths occur annually (WHO and UNICEF, 2008).

In Ethiopia approximately 52 million people (68%) live in malaria risk areas, primarily at altitudes below 2,000 m. The disease is mainly seasonal with unstable transmission in the highland fringe areas and of

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relatively longer transmission duration in lowland areas, river basins and valleys. Historically, there has been an estimated 10 million clinical malaria cases annually in the country (FMOH, 2012).

Ethiopia developed national malaria control strategy in August, 2014. It had goals to achieve near zero malaria death, to reduce malaria cases by 75% from baseline of 2013 and eliminate malaria in selected low transmission area through community empowerment and mobilization, diagnosis and treatment, vector control and malaria elimination. The two major malaria prevention service implemented in Ethiopia has targeted indoor residual spray with insecticide and distribution of Long-lasting Insecticide Treated Nets (LLINs) (FMOH, 2014a). ITN are nets dipped in a pyrethroid insecticide solution. This treatment creates a physical barrier, or a “halo” around the net, repelling or killing the mosquitoes. LLITNs are increasingly popular, as they last longer than traditional ITNs, repelling mosquitoes for up to four years. With LLITNs, the insecticide is woven into the fabric of the nets, causing it to self-replenish with each wash, by bringing the insecticide to the surface of the net (WHO, 2012). LLINs has three main functions: i) when mosquitoes are in contact with the net, it has a knock-down effect, temporarily incapacitating or even killing mosquitoes; ii) it has a repellent effect; and, iii) it reduces contact between the person sleeping under the net and mosquitoes by acting as a physical barrier (FMOH, 2012). When 80% of households use bed nets in a community, studies suggest that mortality from malaria for those living within 300 m is significantly reduced (WHO, 2012).

In Ethiopia experiences have shown that possession and appropriate use of ITNs do not automatically go hand-in hand. Many people who received ITNs did not sleep under them, reduced their efficacy through inappropriate washing practices, or failed to replace them when they became damaged or torn (WHO, 2007). Malaria is of the major health and socioeconomic burdens in Ethiopia (PMI, 2015). In 2013, there were more than 3,000,000 confirmed malaria cases making the first cause of morbidity (11.7 %) and the third leading cause of health facility admission (7.8%) (FMOH, 2013). The use of ITNs was one of the main malaria control strategies in most malaria endemic countries to reach the Roll Back Malaria (RBM) targets reduce the malaria burden by 50% in 2010 compared to 2000 levels and at least 75% by 2015 (RBM, 2005). ITNs have been shown to reduce the incidence of malaria cases by 50% in a variety of settings (FMOH, 2007). Despite the large scale distribution, there was a wide variation in the availability and use of ITNs/LLINs at the household level (RBM, 2005). This study was done, to assess LLINs utilization in Zuway Dugda district and similar studies done in different places but there is no study done on LLINs utilization in this area even though malaria is public health problem in

area.

MATERIALS AND METHODS

Study design and period

A community based cross sectional study design employed and quantitative method used to conduct at household level from 5th March, to 1st April, 2017.

Study area

The study area was Zuway Dugda district, which is 47 km away from Assela Town, capital city of Arsi Zone. It is 222 km away from Addis Ababa. According to the 2007 Ethiopian census report, Zuway Dugda has a total population of 137,223 and 28,588 households. The district have 28 rural Kebeles and two Urban Administrative Kebeles which is all malarious and altitude below 2000 m. In the District there are rivers and irrigation sites which are suitable for mosquito breeding. On the West direction Lake Zuway is boarder of this district. The climatic condition has 85% low land and 15% semi high land. The district has six health centers and 32 health posts. Human resources of the District were 84 health workers and 58 health extension workers (Zuway Dugda Health Office, 2015/2016).

Source and study population

All households in Zuway Dugda district were the source population of the study. Households that randomly selected after multistage sampling were study population. Randomly selected HH heads or any member of the HH >18 year who could provide credible information included in this study. Severely sick person or HH head, person or HH head unable to respond or not available in their home for three consecutive visit plus one more final visit at the end of data collection period.

Ethical consideration

Ethical clearance was obtained from the Institutional Review Board (IRB) of Arsi University College of Health science, Department of Public Health. Project Protocol No. A/CHS/RC/02/17, Archive Protocol No. A/U/H/S/C/120/6143/09 and Date 09/05/09 Eth Calendar. Finally, all questionnaires were kept locked after data entry completion and will be destroyed when they are no more needed.

Sample size and sampling procedures

Sample size determination

Sample size for the first objective were determined using 95% confidence level, margin error-5%, LLIN use proportion is from 2015 MIS in Oromia Region 41% (Table 1).

$$n = \frac{(1.96)^2 * 0.41(0.59)}{0.05^2}$$

n=371.7-372

For the second objective to determine sample size LLINs using

Table 1. Sample size determination of study participants for ITNs utilization and factors associated in the study population.

Objectives	Proportion (%)	Single population proportion formula	Design Effect	Non respondent rate (%)	Total sample size	Reference for p
Utilization	41	$n = z^2 \alpha / 2 * p(1-p) / w^2$	2	10	818	Teklemariam et al., 2015
Ownership	58.5	$n = z^2 \alpha / 2 * p(1-p) / w^2$	2	10	821	Teklemariam et al., 2015
Access	46	$n = z^2 \alpha / 2 * p(1-p) / w^2$	2	10	684	Teklemariam et al., 2015

Table 2. Presentation of sampling procedure on LLINs utilization in the study population.

S/N	Selected Kebeles	35% of all	Total zone	Selected zone	Total House hold in selected zone	Selected household
1	Arba Chefa		3	2	647	84
2	Arata		3	1	454	59
3	Dimtu Rarety		3	1	416	54
4	Hallo		3	1	368	48
5	UboBericha		3	2	626	81
6	Herera		3	1	282	37
7	Ogolcho 01		3	2	883	114
8	Senbero		3	2	1068	138
9	Kiyansho		3	1	476	62
10	Sengo		3	2	426	55
11	Café Jila		3	2	684	89
	Total		33	17	6329	821

95% confidence level, margin error-5%, LLIN ownership proportion is from 2015 MIS in Oromia Region 58.5% (Teklemariam et al., 2015).

$$n = \frac{(1.96)^2 * 0.585(1 - 0.585)}{(0.05)^2}$$

n=373

For other factor access sample size of LLINS using 95% confidence level, margin error-5%, LLIN access proportion is from 2015 MIS in Oromia Region 46% (Tizazu and Anteneh, 2006).

$$n = \frac{(1.96)^2 * 0.46(0.44)}{(0.05)^2}$$

n = 311

Finally, the highest sample size was taken that is, 821 as the minimum sample size adequate for the generalization finding for the general population.

Sampling procedure

The study was multistage. The district has a total of 30 kebeles. Thirty five percent were included in the study which were 11. These had 33 sub-kebeles (Zones) with 12,657 households that were

selected by lottery method. Then ArbaChefa, Arata, Dimtu Rarety, Hallo, Kiyansho, UboBericha, Sengo, Senbero, Ogolcho 01, Herera, Café Jila were selected for this study. Then in order to get sampling frame all zone in selected Kebeles were listed and 50% zone a total of 17 were selected proportionally. To select household a sampling frame existed with family folder registration at village's level. Households in zone were selected with a systematic simple random sampling technique. The first household selected by lottery method and the next by Kth interval. Finally 821 households selected proportionally for this study (Table 2).

Variable of the study

Dependent variable

Proper utilization of ITNs.

Independent variable

Sociodemographic variables: Age, educational status, occupation, family size, types of house construction, availability of separated sleeping room, income, knowledge about the cause and prevention of malaria, Source of information, benefit of ITNs, availability of ITNs, number of ITNs, Source of ITNs, frequency of using ITNs.

Current status of ITNs: Age of ITNs, ever washed ITNs, shape, color.

Operational definitions

HH fully covered by ITNs: An HH with an ITN for each and every sleeping area/beds and observed by enumerators during data collection (FMOH, 2012).

ITN ownership: HHs with one or more ITNs per HH (FMOH, 2012).

Proper utilization: Refers to HHs that owned an ITN in which one or more members of the HH slept under a net, confirmed through observation by enumerators during the early morning preceding this study (FMOH, 2013, 2007).

Access: The proportion of the population that could sleep under an LLIN if each LLIN in the household was used by up to two people (Tulu et al., 1993).

LLINs: Are nets that are treated at factory level by a process that binds or incorporates insecticide into the fibers. They are designed to maintain their biological efficacy against vector mosquitoes for at least 3 years (WHO, 2008).

Illiterate: Respondents who cannot read and write or who can read and write but informal education (FMOH, 2004).

Literate: Respondents who have formal education (FMOH, 2004).

Data collection procedures

A structured questionnaire was used for data collection. The questionnaire was prepared originally in English and translated to Afan Oromo. Data were collected by a combination of face-to-face interview and observation. The data were collected by six trained diploma nurses during early morning session. ITN use was cross-checked with the interview response of HHs, through direct observation of the enumerators. They checked to confirm that HH ITNs were really utilized/hung up just above sleeping beds/areas or not. Two supervisors who were skilled in the malaria-prevention and -control program of the district health office and principal investigator were assigned to supervise the data-collection process and quality assurance. The data collectors and supervisors were trained for 2 days by the principal investigator.

Data quality assurance

The questionnaire was prepared originally in English and translated to Afan Oromo and back to English by language experts to keep the consistency of the questions. Training of data collectors and supervisors, and pre testing of questionnaire on 5% of the sample from households from Hetosa district were done to ensure the quality of data. Checking on spot and double data entry on EPI INFO-7 was done to ensure completeness and consistency of the information collected. To decrease recall bias 24 h recall time was taken for utilization.

Data processing and analysis

Data were entered, cleaned and edited using EPI INFO version-7 statistical software and then exported to SPSS Version 21 for further analysis. Descriptive statistics of the collected data were done for most variables in the study using statistical measurements. Frequency tables, percentages, means and standard deviation were used. Bi variable logistic regression analysis was conducted primarily to check which variable have association with the dependent variable individually. Variable found to have association

with the dependent variable at 0.2 probability were entered in to multi variable logistic regression for controlling the possible effect of confounders and finally the variables which have significant association were identified on the basis of OR, with 95% CI and 0.05 p-value to fit in to the final model.

Among variables studied, bivariable logistic regression analysis of ITNs used in this study, some variables showed significant difference with p-value of <0.05. Variables that were significant at p-value ≤ 0.2 were entered for back ward step wise logistic regression, which controlled undesirable effect of cofounder between variables and the problem of multicollinearity and declared true association. Hosmer and Lemeshow goodness of fit statistics were checked for fullness of the model. The final model showed 0.684 goodness. Very far from 0.05 and clearly indicating the outcome variables was fully explained by the independent variable entered in the full model.

Ethical considerations

The study carried out after getting clearance from the ethical review committee, college of health science, Arsi University. Then an informed consent obtained from each institution and study participants to participate in the study. Those households who refuse to participate in the study not forced. Each respondent informed about the objective of the study. Confidentiality granted for information collected by keeping the privacy of respondents while filling the questionnaire. Those households who did not use long lasting treated net properly advised for proper utilization.

RESULTS

Socio demographic characteristics

In this study, total of 821 households included, with 821(100%) response rates. Among study participants 707(86.1%) were rural and 442(53.8%) were females. The mean (SD) age of respondent's were 37.96(12.3) and mean (SD) family size were 5.09(2.28). The majority respondents 631(76.9%) were farmers and 272(33.1%) unable to read and write and 265(32.3%) were primary school. Among the studied HHs 573(69.8%) were living in corrugated iron sheet roof houses while 433(52.7%) had separate sleeping room, and 354(81.8%) had single sleeping room (Table 3).

Knowledge of respondents about malaria transmission and prevention among respondents of LLIN utilization in the study population

Almost all respondents had ever heard of malaria. From 817 respondents 619(75.4%) of them mentioned mosquito bite as the main mode of malaria transmission, 95(11.65%) said that malaria transmitted by living near stagnant water. Majority of respondents 623(75.9%) reported ITNs as main prevention measure against malaria. Peak biting hour for mosquito was reported to be at night time by 775 (94.4%). Majority of them 621 (75.6) had ever heard/seen educational message on ITNs. Health extension workers or health workers were the

Table 3. Socio-demographic characteristics of respondents involved in the study of LLIN in the study population.

Variable (n=821)	Frequency	Percent
Residence		
Urban	114	13.9
Rural	707	86.1
Age of respondent		
15-29	227	27.6
30-44	373	45.4
>45	221	26.9
Sex		
Male	379	46.2
Female	442	53.8
Religion		
Muslims	668	81.4
Christians	153	18.6
Marital status		
Single	37	4.5
Married	700	85.3
Divorced	17	2.1
Widowed	67	8.2
Occupation		
Farmer	631	76.9
Government employee	101	12.3
Merchant	27	3.3
Private work	61	7.4
Fisherman	1	0.1
Educational status		
Unable to read and write	272	33.1
Able to read and write	85	10.4
Primary (1-8)	265	32.3
Secondary (9-12)	120	14.6
Tertiary	79	9.6
Ethnicity		
Oromo	711	86.6
Amhara	40	4.9
Gurage	36	4.4
Tigre	1	0.1
Zeyi	26	3.2
Wolayita	7	0.9
Family Size		
1-4	349	42.5
5-8	407	49.6
>8	65	7.9

Table 3. Contd.

House roof construction		
Thatched roof	248	30.2
Corrugated Iron sheet	573	69.8
Separated sleeping room		
Yes	433	52.7
No	388	47.3
No of sleeping room		
1-2	428	98.8
>2	5	1.2
Income		
<500	381	46.4
500-1000	299	36.4
>1000	141	17.2

main source of information (Table 4).

ITNs ownership and Utilization among households in the study population

From 821 HHs who participated in this study 692(84.2%) owned at least one ITNs. 691(99.8%) were supplied freely by government. One hundred seventy six (25.5%) of the HHs were supplied with one, 293(42.4%) with two, remaining with three or more ITNs. 1516 ITNs were supplied to the HHs included in this study. Of those 692 HHs who owned at least one ITNs, Only 125(18%) used or slept under ITNs the night prior to data collection (Table 5).

Condition of ITNs in HH who owned ITNs and their preference among study participants of LLIN utilization in Zuway Dugda district, Arsi Zone, Oromia Region, Ethiopia, 2017

Among (n=692) households who owned ITNs, 643(92.9%) of them had age one year. While, 384 washed at least once and 360(93.8%) washed 1-3 times (Table 6).

Multivariable analysis for factors associated with ITNs utilization in the study population

From entered variables only five remained significant predictor of the outcome variable. HHs head who were literate 1.88 times more likely to use ITNs than their counter parts, with AOR(95%CI) of 1.879(1.067-3.309).

HHs that had separate sleeping room were 2.15 times more likely to use ITNs than HHs who had not had separate sleeping room. HHs who were their shape preference rectangular were, 47% less likely to use ITNs than those who prefer conical shape with AOR (95%CI) of 0.535(0.310-0.923) (Table 7).

DISCUSSION

In this study ITN ownership and utilization was found to be 84.2 and 18% respectively. Only 18% of HHs use ITNs regularly without interruption. From this study, even though net was available in the HHs less than one fourth of them used at least one of their LLINs in previous night prior to data collection.

World malaria report of 2015 showed wide range estimates of ITNs utilization in Africa. Among five surveyed countries the median proportion of population sleeping under ITNs highest and lowest estimates were 74 and 20% respectively. The report showed that in sub-Saharan countries the proportion of population who use ITNs was 55% (WHO, 2015b), and the current study finding falls in the lowest estimates. Another studies done in Togo and Rwanda showed 71.4 and 72.3% utilization which is four fold than this result (America Association for Advancement of Science, 1991; ORHB, 2001). Similarly another study done in Kenya showed utilization of 53% (Watiro and Awoke, 2016), which is three fold of the current study finding. This might be due to geopolitics and socioeconomic differences of the study areas.

In Ethiopia, from 2015 EMIS it was reported 40% HHs used (slept under) ITNs the night before the survey. It also differs from region to region in the country with the highest in Afar Region (51%) and lowest in Dire Dawa

Table 4. Knowledge of respondents about malaria Transmission and Prevention among respondents of LLIN utilization in the study population.

Variable	Frequency	Percent
Ever heard about malaria(n=821)		
Yes	817	99.5
No	4	0.5
Cause of malaria (n=817)		
Bitten by mosquito	619	75.4
Leaving near stagnant water	95	11.6
From unclean environment	52	6.3
Being hungry	21	2.9
I don't Know	8	1.0
Leaving with people caught by malaria	7	0.9
Working in the sun	5	0.6
Cooled weather	10	1.2
Main preventive measure (n=817)*		
ITNs	623	75.9
Drainage of stagnant water	340	41.4
Take tablet	232	28.3
Proper disposal of waste	178	21.7
IRS	145	17.7
Close door and window	23	2.8
Use fumigants	19	2.3
Nothing	8	1
Use traditional plant	3	0.4
Eating	1	0.1
Mosquitoes peak biting hour(n=817)		
Day time	2	0.2
Night time	775	94.4
All time	20	2.4
I don't know	20	2.4
Educational message on ITNs(n=821)		
Yes	621	75.6
No	200	24.4
Source of information(n=621)*		
Radio	97	11.8
Television	40	4.9
Community meeting	160	19.5
HEW/Health worker	468	57
School	23	2.8
ITNs benefits		
Yes	813	99
No	8	1

Table 4. Contd.

Benefit of ITNs(n=813)*		
Don't get bitten by mosquitos	584	71.1
Don't get malaria	190	23.1
Prevent other insects	429	51
To get warmth	4	0.5
Other	4	0.5

* Shows variable with multiple answers.

City Administration (16%). This study was also similar to the lowest utilizing region (Tulu et al., 1993). Study done in Wanago and Itang Gambella of Ethiopia showed that utilization was 75.5 and 52.3% respectively which is higher than this study result (FMOH, 2004; Teklemariam et al., 2015). In Oromia ITNs utilization was 41% (Tulu et al., 1993) more than double of Ziway Dugda. Studies done in Harari and Chawaka showed 73.3 and 80.1% which were four fold of the current study and proxy to national target (Tomass, 2011; Kateera et al., 2015) that also is by far more than the current finding. Similarly, study done in Jimma and Kersa showed low ITNs utilization of 38.4 and 21.8% respectively which was still better than the result of this study (Stevens et al., 2013; FMOH, 2014b).

The national strategic plan targeted to reach 100% ownership and 80% utilization in malaria endemic areas by all ages and biological groups to brought herd immunity by using LLINs (FMOH, 2014b). ITNs utilization in studied area was lower when compared to world malaria report and a number of studies done in the country. This might be due to the current cross sectional study was conducted during the dry season of the area with no other mosquito's nuisance and 332(58.6%) responded they didn't use available ITNs due to absence of mosquitoes. Additionally, the reason might be from knowledge as a large proportion of illiteracy among participants which 43.5% and majority, 86.1% were rural community.

When we see LLINs ratio to person there were 2.75 persons per ITN. Another study done in Chewaka showed there were 4 person per ITN (Kateera et al., 2015) while similar study done in Wanago showed 3.98 persons per ITN [FMOH, 2004]. National strategic plan targeted one ITN for 1.8 persons (FMOH, 2014b). The current study showed a better access of ITNs than in Chawaka and Wanago though less than the national target which might be due to the distribution of ITN done before one year and gap filling performed in the current study area.

In current study independent factors for ITNs use were educational status of respondents, having separated sleeping room, frequency of using ITNs, ITNs ever been washed and shape preference of respondents. Similarly studies done in Wanago, Harari, Kersa and Gilgelgibe in

Ethiopia showed that educational status of respondents were predictive factor for LLINs utilization (Tulu et al., 1993; Tomass et al., 2011; FMOH, 2015; Seyoum et al., 2017). The current study showed that literates were 1.88 times more likely to use ITNs than their counter parts. Research done in Harari of Ethiopia also revealed those respondents learned to secondary school were 1.78 times more likely to use ITNs than those who could not read and write (Tomass et al., 2011). Similarly study done in Wanago literates were 1.31 times more likely to use ITNs than their counter parts (FMOH, 2004). Differently study done in Gilgel Gibe South West Ethiopia illiterates were 2.3 times more likely not to use ITNs than those who learned grade 9 or above (Seyoum et al., 2017). This is because educated people are more likely to get knowledge through formal learning or by reading any form of readable materials and even more access and understand information from mass media.

Having separated sleeping room also had positive association with ITNs utilization. Those HHs with separate sleeping room were 2.16 times more likely to use ITNs than those who haven't separate sleeping room. Study done in Wanago showed that HHs with separate sleeping room were 1.98 times more likely to use ITNs (FMOH, 2004). Study done in Kersa also identified that use of ITNs depended on housing construction and absence of separated sleeping room to hang it (FMOH, 2015). This might be due all activities done in single room. Food also prepared by open fire in this single room so hanging net in the room unfavorable with all activities.

Insecticide treated net ever been washed shows significant increase of utilization compared to HHs with unwashed ITNs. This might be due to HHs perception to use clean ITNs as opposed to dirty ITNs. Washing dirty ITNs also increase chemical emission fibers of nets. Similar study done in Chewaka district showed HHs ever washed ITNs were 2.66 times more likely to use ITNs than unwashed (Kateera et al., 2015).

Shape preference of respondent's also found to be one barrier of ITNs utilization. Those households who prefer rectangular shape were 47% less likely to use ITNs than who prefer conical shape. Probably rectangular shape were more suitable to use for other purposes like collecting agricultural products. A study done in Wanago also showed that those who prefer rectangular were 1.17

Table 5. ITN possession and ITN utilization by household of participants involved in the study in study population.

Variable	Frequency	Percent
Availability of ITNs (n=821)		
Yes	692	84.2
No	129	15.8
Reason for unavailability (n=129)		
Don't get	50	38.8
Used for other purpose	12	9.3
Worn out	64	49.6
Give to others	3	2.3
Source of ITNs (n=692)		
Government	691	99.8
Purchased	1	0.2
Frequency of using ITNs (n=692)		
Consistently	223	32.2
Intermittently	469	67.8
Time they use intermittently(n=469)		
Rainy season	458	97.7
Winter	11	2.3
No of ITNs (692)		
1-2	469	67.8
3-4	216	31.2
>4	7	1
Utilization (n=692)		
Yes	125	18
No	567	82
Given priority to slept under ITN (n=125)*		
HH head	25	3
Children \geq 5 years	3	0.4
Children under 5 years	99	79.2
Pregnant women	59	47.2
Reason for not using available ITNs(n=567)		
Absence of mosquito	332	58.6
It's dirty	149	26.3
It's too hot slept under	33	5.8
It takes place	22	3.9
It takes time to tuck	14	2.4
It's difficult to get up	9	1.6
Gave to others	8	1.4
IRS against mosquito(n=821)		
Yes	440	53.6
No	381	46.4

*Shows variable with multiple answer

Table 6. Condition of ITNs in HH who owned ITNs and their preference among study participants of LLIN utilization in the study population.

Variable	Frequency	Percent
Age of ITNs (n=692)		
1year	643	92.9
2 years	40	5.8
≥3 years	9	1.3
ITNs ever been washed (n=692)		
Yes	384	55.5
No	308	45.5
Frequency of washing (n=384)		
1-3 times	360	93.8
>3 times	24	6.2
Presence of hole or tear on ITNs (n=692)		
Yes	118	17
No	574	83
Shape owned(n=692)		
Rectangular	690	99.7
Conical	2	0.3
Shape preferred(n=821)		
Rectangular	622	75.7
Conical	199	24.3
Color owned (n=692)		
Blue	692	100
Color preferred (n=821)		
Blue	716	87.2
Green	58	7.1
White	47	5.7

times more likely to use ITNs than who prefer conical (FMOH, 2004). Frequency of using ITNs had strong association with utilization. In this study those HHs who responded using ITNs consistently were found 18 times more likely to use it than those who use intermittently. This might be appearance of mosquito nuisance only during wet season.

Respondent's awareness on mode of transmission and malaria prevention measure was analyzed. Accordingly, 75.4% answered transmission was by mosquito bite and 75.9% respondents answered that use of ITNs was preventive measure. So those who know malaria transmission know prevention as well. This might be due to many non-governmental organizations done on

awareness creation on malaria and ITNs, even though, they could not come with behavioral change on ITNs utilization.

Strength and limitation

Direct observation was carried out to check the actual behavior of the study population with regard to ITNs utilization. The study was carried out after one year of long lasting treated net distribution to the community better timing to measure behavior. The study was conducted in malaria endemic area where malaria had public health importance using raw data. It lacks

Table 7. Bivarible and Multivariable analysis model for factors associated with ITNs utilization among the study participants in the study population.

Variables	Category	ITNs Uses		COR	95%CI		AOR	95%CI	
		Yes	No		Lower	Upper		Lower	Upper
Education	Literate	29	285	3.45	1.88	6.32	1.88	1.07	3.31
	Illiterate	96	282	1	1	1	1	1	1
Separate sleeping room	Yes	86	288	2.14	1.41	3.23	2.16	1.25	3.76
	No	39	279	1	1	1	1	1	1
Frequency of using ITNs	Consistently	107	116	23.11	13.48	39.64	18.01	10.26	31.61
	Intermittently	18	451	1	1	1	1	1	1
Ever washed ITNs	Yes	94	290	2.90	1.87	4.49	3.28	1.93	5.59
	No	31	277	1	1	1	1	1	1
Shape preference	Rectangular	66	456	0.27	0.18	0.41	0.54	0.31	0.92
	Conical	59	111	1	1	1	1	1	1

qualitative method complement the quantitative data. No cause and effect be depicted.

Conclusion

Although LLINs ownership was moderate, only small proportion of the HH members utilize or slept at least under one ITN in previous night prior to data collection. The consistent use of ITNs in this study was poorest (18%) when compared to country target (80%). On average three individuals share a single ITN which is better than other studies findings. Factors determine LLINs utilization in surveyed HHs includes Educational status, having separated sleeping room, frequency of using ITN, washing ITNs at least once and shape preference of respondents.

RECOMMENDATION

At Kebeles level

Health extension workers (HEWs) evidence based practice should be designed. Enhanced health education and community mobilization should be employed to increase proper utilization of ITNs by demonstrating proper hanging of ITNs. HEWs teach how to wash and when to wash ITNs and benefit of washing. House to house visit should be done by HEWs to see HHs utilization ITNs. Better prepare and facilitate community conversation on why available ITNs could not be used properly and come to solution with community. Encourage

those HHs those use ITNs properly and consistently. Cooperate with Kebeles leaders and control ITNs used for other purpose.

At district health office

Review malaria control programs mainly ITNs utilization. Plan for gap filling those HHs who did not get ITNs and those reported worn-out.

At FMOH

Monitor and evaluate LLINs utilization. Encourage qualitative and quantitative research's done around this program. Work with stake holders to improve housing quality. Distribute ITNs in line with national target that is, 100% ownership. Jointly work with wash program to improve personal hygiene and washing habit of ITNs.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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ABBREVIATION

ASL, Above sea level; **FMOH**, Federal ministry of health; **HH**, Household; **HEW**, Health extension worker; **IRS**, Indoor residual spray; **ITN**, Insecticide treated net; **LLITN**, Long lasting insecticide treated net; **MIS**, Malaria indicator survey; **RBM**, Roll back malaria; **SD**, Standard deviation.

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Full Length Research Paper

Barriers of palliative care practice among health care providers: In case of Jimma town, south west Ethiopia

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Globally, palliative care is an urgent humanitarian need for patients with cancer and other chronic disease. Currently, it is estimated that only one in ten people who need palliative care receive it. Therefore, this study is aimed to identify barriers preventing people from using the service. Institutional based qualitative case study was conducted among twenty- seven purposively selected health care providers. Two focus group discussions and fifteen individual interviewed were conducted from 1st April to 30th June 2017. Ethical clearance was obtained from the university ethical review board. Atlas ti 7 was used to assist deductive analysis. A total of 27 health care providers from two public hospitals and one local nongovernmental organization were included in this study; fourteen of them were health professionals and thirteen were peer educators; of which 20 (74.07%) were females and 7(25.93%) were males. Unavailability of drug, un-conducive working environment, patient-related problems and lack of recourse are identified as barrier to provide palliative care. Numerous barriers exist on the healthcare providers' side, for the provision of palliative care for patients with chronic disease. Additional research is required to explore barriers in a patient side.

Key words: Palliative care, Jimma, barriers, health care providers, peer educators, qualitative.

INTRODUCTION

Palliative care is an organized care which is provided to patients and their families going through a progressive, chronic, life threatening disease to relieve the symptoms of the disease by incorporating psychosocial and spiritual care, and it is essential to the management of all patients with non-communicable, communicable diseases, injuries and trauma (Meier, 2014; Steedman et al., 2014).

Globally, palliative care is an urgent humanitarian need for patients with cancer and other chronic disease and is required in countries where a high proportion of patients in advanced stages of disease and little chance of cure (Elshamy, 2015). The global burden of cancer is expected

to grow to 21.6 million new cancer cases by 2030, and from this, 13 million cancer deaths is due to the growth and aging of the population (American Cancer Society (ACS), 2018). Worldwide, non-communicable disease is responsible for 71% (41 million) of the 57 million deaths; similarly, in Ethiopia, 39% of deaths are due to non-communicable disease (Global Health Estimates, 2016; WHO, 2018). An overall prevalence of chronic disease in Jimma town was 8.9% (Martin, 2012). High rates of death and disease, particularly in developing countries, are a reflection of insufficient NCD premature death minimizing interventions (WHO, 2014).

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Currently in Sub Saharan Africa, palliative care provision remains inadequate and available to less than 5% (Eve, 2013). It is estimated that one in 10 people who need palliative care are currently receiving it; and only 2% of terminally ill patients having access to opioids to manage pain and 80% of the global need for palliative care is in low- and middle- income countries (Human Right Watch, 2011; WPCA, 2014). As ageing population increases, it results in living longer with more comorbidities, which obligates the health systems to focus on palliative care service in order to improve quality of life and decrease the negative impacts in the last days of life the patient (Morin, 2017). Several studies in different country showed that palliative care programs could improve patient outcomes, including symptom control and quality of life and caregiver outcomes, such as reduced stress and dysfunctional grief (Pippa, 2017; El-Jawahri, 2017; Kelly, 2018). Despite its effectiveness and strong recommendations for broad application, palliative care remains underutilized and only a small proportion of patient are getting the services so, the aim of this study is to explore the barriers preventing from using the service.

MATERIALS AND METHODS

Study area

The study was conducted in Jimma town, which is one of the towns in the Oromiya region located 352 km from Addis Ababa (the capital city). Currently, three health care settings, namely Jimma university medical center, Shenen Gibe hospital and Organization for social service health and development provide palliative care collaboratively by the health professionals and peer educators in the town.

Study design and period

Institutional based qualitative case study design was employed from 1st April to 30th June 2017.

Sampling technique and participant selection procedures

A criterion-based purposive sampling was used. Any health care providers who had experience in caring for patients with chronic life-threatening disease were selected as a study participant. For in-depth interview, health professionals and four focused group discussions peer groups were selected. Health care providers assisted participant selection.

Data collection procedure and tools

Data were collected by the principal investigator and assisted by two research assistant (RA) having BSC degree and MSC degree and experience in qualitative research data collection after taking one day training by using semi-structured interview guides containing open-ended questions after commented by an expert. Fifteen in-depth face to face interview, two focused group discussion was

conducted, and probing question was used. Voice recorders and field-notes were used to capture the information.

Data analysis

The data were analyzed with thematic analysis, using both an inductive and deductive coding approach. All data were transcribed verbatim and translated into English by the Principal investigator and RA. The transcripts were read and reread to gain familiarity with the data and were checked against the recordings to confirm or correct any errors and exported directly into Atlas.ti7.1. The process was supported by the analytic memoing during the coding phases. Category and subcategories are developed into themes for each participant and across different participant. Forty primary codes are identified and then the codes are examined for similarities and merged. Finally, it was expressed in four main categories.

Operational definition

Provision of palliative care - an institution that provide at least two components (physical care, social care, psychological care, spiritual care and practical care) of palliative care considered as they provide the services.

Trustworthiness

Respondents with different educational status and professional background were selected for the interview and discussion, regular debriefing meetings and review of data collection forms were held daily. Iterative questioning to get in-depth information, peer scrutiny of the research by colleagues, peers and academics and feedback from the presentation were welcomed. The interviews and discussion were transcribed into word, in the language of respondent by the principal investigator and research assistant then translated into English language for analysis. Member check was done. In addition, a narrative thick description was conducted. Qualitative research experts were consulted during data collection, analysis, and report writing. First interviews, then focused group discussions were conducted.

Ethical considerations

Ethical clearance and approval to conduct the research were obtained from the university institutional review board and cooperation letter is sent to respective health institution management. Anonymity was kept. All typed records were kept on password- protected computer and backup drive. All interviews and discussion were recorded after obtaining the participants' permission. When the participants did not want the audios of the interview recorded, notes were taken and analyzed along with other data. Written consent was obtained from all participants after orientation.

FINDINGS

Participants' characteristics

Twenty-seven health care providers from two public hospitals and one local nongovernmental organization; 14 (51.85%) of them are health professionals and 13 are peer educators (48.14%) participated in this study among those

Table 1. Distribution of study subjects by socio-demographic characteristics in health care institutions of Jimma town, Ethiopia, 2017.

Characteristics		Frequency
Sex	Male	7
	Female	20
Professional category	Nurse	8
	Physician	3
	Pharmacist	2
	Midwifery	1
	Peer educators	13
	General practitioner	3
Educational status	Msc degree	1
	Bsc Degree	7
	Diploma	3
	Below diploma	13

Table 2. Summary of themes, subthemes and quotes of barriers of palliative care practice, in health institutions of Jimma town, Ethiopia, 2017

Main theme	category	sub- category	quotes
Barriers of palliative care practice	(i) Working environment related problems	(i) uncondusive working environment,	“when I advise patient someone enters to the room and our discussion interrupts , not only this the patient don’t feel free to discuss all the issues. I think caring patient is like caring plants. ↑.”(a 35 years old case manager) “Sometimes patient flow becomes high, we face difficulty to provide the service because we are only four staffs providing the service.” (a 27 years old Nurse)
		(ii) shortage of room	
	(ii) Patient related problems	(iii) unstable home address, name	
		(iv) resistant to stay in the hospital	
	(iii) Resource related problems	(v) interruption of support	
		(vi) unavailability of drug	
	(iv) Problems related to health professionals	(vii) lack of team approach	
		(viii) shortage of staff (health professionals)	
		(ix) shortage of medical equipments	

20 (74.07%) were females and 7(25.93%) were males. Eleven (40.7%) of them has educational status above Bachelor of Science degree (Table 1).

Barriers to provide palliative care

The result of this study indicated that the study participants have an awareness of palliative care and provide it by calling “comfort care”. The service is provided for HIV/AIDS positive and cancer patients in structured manner, but for other patients pain management has given due focus in all health institution. The result of this study identified the following barriers while provision of palliative care (Table 2).

Problems related with the working environment

Most participants mentioned that, the environment where

the service provided should be comfortable as much as possible but, lack of privacy while providing the service exposes the patient to have an unnecessary effect on the disease prognosis. A 27 years old male Nurse interviewee said that “*The room is not comfortable, better to stay in a corner, (...) privacy not kept for a patient, you are unable to discuss freely with them, and patient don’t feel free*”.

Additionally, the participants mentioned that the importance of palliative care unit is to provide the service freely in order to have the desired outcome on patient life and also to discuss confidently with the patient to attain his need. A 35 years old female key informant said “*When I advise patient someone enters the room and our discussion is interrupted because we don’t have a separate room for palliative care...the patient doesn’t feel free to discuss all the issues*”.

However, few participants reported that even if there is no room for palliative care, the available area should be conducive for the patients to discuss freely and to provide

the service, as well as the staff relationship should be friendly while providing palliative care. Regarding this, a 31-year-old female diploma nurse interviewee said that *"The working environment is comfortable and the staffs are willing to share what they know"*

Problems related to patient

FGD discussants mentioned that they have their own clients in the community; these clients already disclosed themselves and use the service but, some of the clients vanish after using the service. They search for those patients in collaboration with health extension workers; due to health extension workers busy schedule, they go to patients home alone. Even if they search the whole day, they do not get them, because patients conceal themselves by frequently changing their name and address due to fear of stigmatization and discrimination.

"When the patient defaults treatment we will find them in the community; since the patients change their name and address...You stay all day searching for her, but she is there, when you ask her, she says" such kind of woman does not live here".

While other discussant describe unwillingness of patients to use the service.
"Some patient throw stone on us, untie their dog, when we go to their homse".

Several respondents described that the patient's family are un-willing to initiate palliative care, by hoping for a miracle or consideration of treatments futile for the patient. Increased possibility of death combined with denial on the part of patient's family serve as an important barrier to receive and initiate palliative care.

Regarding this 28 years old male general practitioner interviewee said that
".... if they (the attendant) know the patient is diagnosed with chronic disease, they hesitate to initiate palliative care discussions and interventions."

Unavailability of drug

As reported by health care providers, patients with life-limiting conditions frequently have multiple symptoms as a result access to pain medication is one component of palliative care but inaccessibility and unaffordable to the medication make it difficult to manage pain symptom.

A male oncology nurse interviewee said that *"...there is financial problem... the drugs are expensive, some patients unable to pay...patients are suffering due to pain"*.

A female oncology Nurse interviewee said that *"... Last*

year we faced a challenge to manage pain... currently there is shortage of pain medication... due to diclofenac is contraindicated in children less than twelve year, ... we provide morphine by decreasing the dose."

A 32 years old male pharmacist interviewee supported the idea and said that *"...currently morphine is a preferred drug for severe pain management, but for pediatrics, the suspension form is not currently available in our hospital."*

Resource related problems

Continuous support for the palliative care patients in material or in-kind has a temporarily means to resolve their illness, by decreasing psychological burden being economically weak.

As described by study participants, sometimes there is an interruption of material supports provided by the nongovernmental organization for patients who need palliative care.

A 34 years old male manager interviewee said that *"When supports are interrupted, we face difficulty; actually everyone should be economically independent but little support is needed for those who are critically sick."*

The FGD discussants also mentioned the negative impact of economic support on the acceptance of care by the patients.

"Due to interruption of support provided by the organization, when we go to patients home, they (patient) say "why did you come without material support".

Problem related to health care providers

According to the analysis, most participants mentioned that all health care providers are responsible to provide palliative care and the essentiality different discipline in solving different problems of the patient and to appeal for a better solution.

A 30 years old male general practitioner interviewee said that *"Sometimes things become very complicated, (...)when the patient caught by chronic disease, it is related with almost all system so, I have to discuss with other medical staffs to provide medical service."*

Similarly a 26 years old male pharmacist interviewee said that *"...Every health service is provided in a team if one of the team member is missing, the service would not be adequate."*

Even the participants agree on the essentiality of multidisciplinary/team approach in the provision of palliative care, but absence of bringing diverse disciplinary points of view together while providing palliative care service challenged them to provide the service.

A 27 years old male Bsc nurse interviewee said that *"During training, we thought palliative care is provided in a team but it is practically different; the physician order*

medication and leaves the patient (...) comes and assesses again (...) Writes order and go."

The participants also described disproportion between patients to health care provider ratio while providing palliative care for the patient as a challenge.

Regarding this a 48 years old key informant said that *"Sometimes patient flow increases, during that time (...) we cannot provide the palliative care for patients, because of shortage of health professionals."*

DISCUSSION

Palliative care has been on for about a decade. It is not yet known as routine care and this study focus mostly on outpatient department and very little on inpatient unit. Besides, staff shortage makes the service inaccessible. This finding similar with that of a study done in five European country (Jasper van, 2014). This leads to decrease in the quality of life of the patient (Ernst, 2014).

One of the important aspects of palliative care is the availability and possibility of utilizing medical resources and financial support. In this study, social support is provided by the nongovernmental organization and the eligible patient is determined by the health professionals and referred to. However, most of the patients do not get the support timely, as a result, they are severely ill and go to missionaries; the missionaries help the patients for a while and let them go after offering immediate support. Since, the support is very limited, the patients suffer economically and discontinue the medication and finally, they either die or go to second-line drugs, which are very expensive, and with many side effects. This finding is similar with a study done in United Kingdom (Clare, 2011). In order to increase the quality of life and to decrease frustration due to fragmented and disjointed care for patients with life-limiting illness the service should have continuity. This is associated with the option of further home care or/and collaboration with other units. In this study, service inaccessibility and interruption challenge people to use other services, this is in line with the study done in England (Nathan C. et al. 2014).

To have mutual trust between the patient and the healthcare providers, the service should be provided in both setting either by one health care institution or by having network with other organization who provide similar service in the community. In this study, palliative care is provided separately in both setting and the service are not as recommended by world health organization (Stjernsward J., 2007).

Effective pain control and health sectors capacity to use anti-pain drugs efficiently is the foundation of palliative care. It is best achieved through a holistic approach in-order to address psychological, social, spiritual and physical needs of a patient and their family. The result of this study indicated that problem related to prescription and supply of anti-pain drugs are identified as barrier in contrast with the finding of a qualitative study conducted

in Canada, England, Germany, and United State.

This study and others have observed obstacles that health professionals perceive as preventing the provision of palliative care. The results of this study point out that work environment related problem and patient-related factors are significant and they encounter these when they perform their duty; which is similar with study conducted in United Kingdom (Clare G., et al. 2011).

Non-disclosure is an important public health problem that affects individuals' access to treatment and care (Bezabhe WM., 2014). In this study, the peer educators mostly see this issue during palliative care provision in the community. Some of them provide palliative care only in the community, while others provide in both the community and healthcare institution; in both settings, interrelated obstacles were identified.

The hospital environment, which encompasses the physical surroundings and the social interactions with hospital staff, can impact on the quality of palliative care experienced by patients (Robinson J., et al. 2015). When the end of life makes its inevitable appearance, patients should be able to expect reliable, humane and effective care giving. In this study, uncondusive working environment and lack of palliative care unit are identified as a barrier, which have an impact on quality of life of the patient.

Conclusions

Various barriers exist in the provision of palliative care, which has a negative impact on quality of life of the patients, resulting from healthcare providers' side. Additional research is required to explore barriers arising from patients' side.

ABBREVIATIONS

ACS, American Cancer Society; **AIDS**, Acquired Immuno Deficiency Syndrome; **ART**, Anti Retro viral Therapy; **BSC**, Bachelor of Science; **FGD**, Focus Group Discussion; **HIV**, Human Immuno Deficiency Virus; **HRW**, Human rights watch; **IDI**, In depth Interview; **MSC**, Master of Science; **NCD**, Non-communicable Disease; **OSSHD**, Organization for Social Service Health and Development; **RA**, Research Assistant; **WHO**, World Health Organization.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Immunization coverage of 12 to 23 months old children in Ethiopia

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Vaccine preventable diseases are the major global health problem which contributes to morbidity and mortality of less than 5 years child population. But, the immunization coverage worldwide is below the target. Therefore, the study was aimed at immunization coverage of 12 to 23 months old children in Areka Town, Sothern Ethiopia. A community based cross-sectional study conducted from 10th March to 19th June 19, 2016 in Areka Town, Sothern Ethiopia. Data on 173 children aged 12 to 23 months from 173 households selected using a systematic random sampling. Analysis was conducted using SPSS version 20. The result presented in the all tables and figures. The study showed that, 130(75.4%) fully vaccinated and 93(53.6%) vaccinated during immunization campaigns. The sources of information for 39(22.5%) were radio and television. 22(12.9%) missed vaccine appointment day and 13(7.7%) interrupted vaccine program. Of the vaccinated children, 166(96.2%) vaccinated for Bacillus Calmette–Guérin (BCG), 138(80%) vaccinated for oral polio vaccine (OPV) 0, 172 (99.2%) OPV₁, Penta₁ and PCV₁, 165(95.4%) vaccinated for OPV₂, Penta₂ and PCV₂, 161(92.9%) vaccinated for OPV₃, Penta₃ and PCV₃, and 158(91.5%) vaccinated for measles. The dropout rate from BCG to measles was 4.7%. Therefore, continuous support and health education at the community level is recommended.

Key words: Immunization, Areka, children, oral polio vaccine (OPV), Bacillus Calmette–Guérin (BCG).

INTRODUCTION

The extended program on immunization (EPI) was launched to reduce morbidity and mortality, promote national self-reliance and deliver immunization services against six major childhood diseases (Lakew et al., 2015). Immunization is a highly effective, cheap and essential components of every child survival programs in the world (Mbengue et al., 2017; Ekouevi et al., 2018). Vaccine preventable diseases are the major global health problem which contributes for morbidity and mortality of

less than 5 years child population (Mbengue et al., 2017). According to prevalence of vaccine preventable diseases in each country and economic status of that nation, every country set their own immunization program (Mbengue et al., 2017). The Ethiopian health policy has given emphases to prevent and control major communicable diseases. It was integrated to general health services as essential component of primary health care. The program goal remained largely unrealized with low and fluctuating

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coverage for many years (Ekouevi et al., 2018). The services are given at static level in health setup, and outreach program and national immunization days (Mbengue et al., 2017).

According to the guidelines developed by the World Health Organization, children are considered to have received all basic vaccinations when they have received a vaccination against tuberculosis, three doses pentavalent, polio vaccines, HBV vaccine and a vaccination against measles (Restrepo-Méndez et al., 2016). Various countries have specific strategies for reaching targeted coverage implementation of new approaches called reaching every district and sustainable outreach. The immunization coverage worldwide is below the target (Mutua et al., 2016; Hu et al., 2015). In Ethiopia, the routine immunization coverage has not reached targeted figures and planned objectives. Insufficient health personnel, lack of adequate health facilities, transportation shortage, high defaulter rate from schedule, missed opportunity, in adequate supplies are among major health problems identified as a cause or factors for low immunization coverage in Ethiopia and many countries (Negussie et al., 2016; Kassahun et al., 2015; Legesse et al., 2015).

Despite improvements world over in vaccine coverage in the last ten years, still there is regional and local disparities due to factors such as limited resources; competing health priorities; poor management of health systems and inadequate monitoring and supervision (Crocker-Buque et al., 2017). Therefore, community awareness creation programs, delivering health education, taking feedback from the mothers and involving the community members in the service delivery may enhance the service utilization (Mutua et al., 2016). Furthermore, continuous training of the health professionals is essential (Kiptoo et al., 2015, Adokiya, et al., 2017). The study was aimed at immunization coverage of 12-23 months old children in Areka Town, Sothern Ethiopia.

MATERIALS AND METHODS

Study design and area

A community based cross-sectional study was conducted from 10th March to 19th June, 2016. All households with 12 to 23 months of age children in Areka town were the source population. Selected households in with 12 to 23 months of age children were the study population. All households with 12 to 23 months of age children who stayed for more than 6 months were included. Parents or care givers who were mentally challenged and chronically sick were excluded.

Sample size determination and sampling technique

The sample size was determined using a formula for estimation of single population proportion with the following assumptions: 76% proportion (Kassahun et al., 2015), $Z_{\alpha/2}$ is the Z value at 95% Confidence level (1.96) and 0.05 margin of error (d). Adding 10%

for the non-response rate the final sample size was 301. A systematic random sampling method was used. The first household was selected by lottery method. Data were collected from every 8th households.

Data collection tools and techniques

A structured questionnaire was used to collect data from the respondents. Three data collectors and one supervisor were used. Training was provided for the data collectors and the supervisor for two days. The session of the training was the objective of the study, meaning of each question and interview techniques. In addition, the role of data collector and the supervisor was covered.

Ethics statement and data quality assurance

Each respondent was informed about the objective of the study and was assured of confidentiality. Each respondent briefly informed about having the right to stop the interview at any time they want. Pretesting was conducted using 5% of the total sample. Training and supervision were provided for the data collectors and the supervisors. Each questionnaire was coded and completeness of filled questionnaire was checked.

Data processing and analysis

Data first were checked for completeness, and then each completed questionnaire was assigned a unique code. Subsequently, the data was entered using EpiData 3.1. The generated data were then exported to SPSS version 20. Finally the results were summarized and presented in texts, tables, and graphs.

Operational definition

Full vaccination

A child who takes all vaccine and full dose according EPI schedule by age of 12 month.

On vaccination process

A child who already started vaccination and still on vaccination process according to EPI schedule but not complete or default vaccination.

RESULTS

Socio-demographic characteristics

One hundred fifty five (89.6%) were the first child and 68(39.3%) were 12 to 15 months old age (Table 1).

Source of information

The source of information for 15(8.7%), 34(19.7%), 39(22.5%) and 85(49.1%) were radio, television; both radio and television and others source of information, respectively. Regarding the written source of information,

Table 1. Socio-demographic characteristics.

Variables	Frequency	Percent
Child's birth order		
1	155	89.6
2 and above	18	10.4
Number of 12-23 month children		
12-15 months	68	39.3
16-19 months	62	35.8
20-23 months	43	24.9

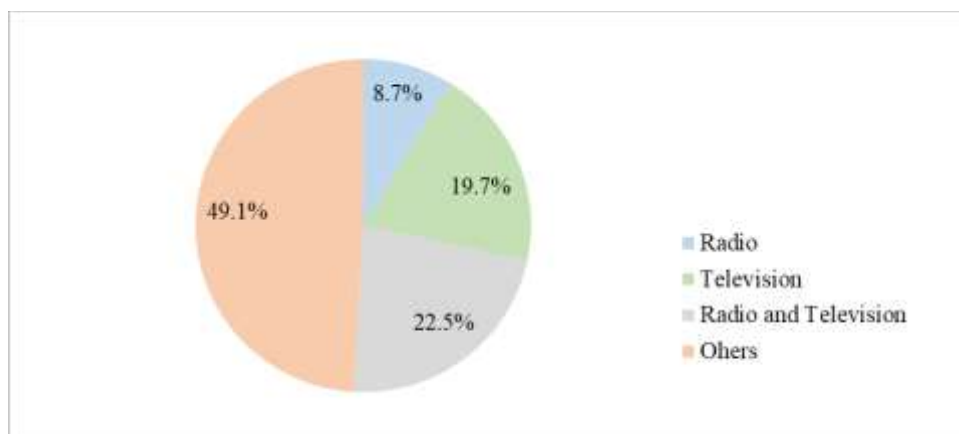


Figure 1. Source of information for mothers/caregivers.

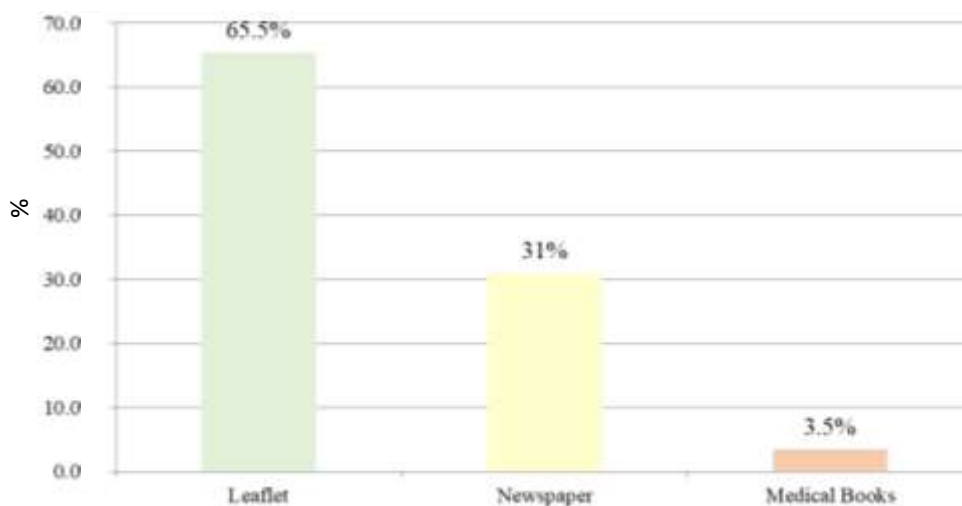


Figure 2. Source of information about immunization in studied group.

113(65.5%), 54(31%) and 6(3.5%) had information from leaflet, newspaper and medical books, respectively (Figures 1 and 2).

Knowledge of the vaccine preventable diseases

Fifty eight (33.3%), 52(30%), 42(24%), 17(10%), 2(1.3%)

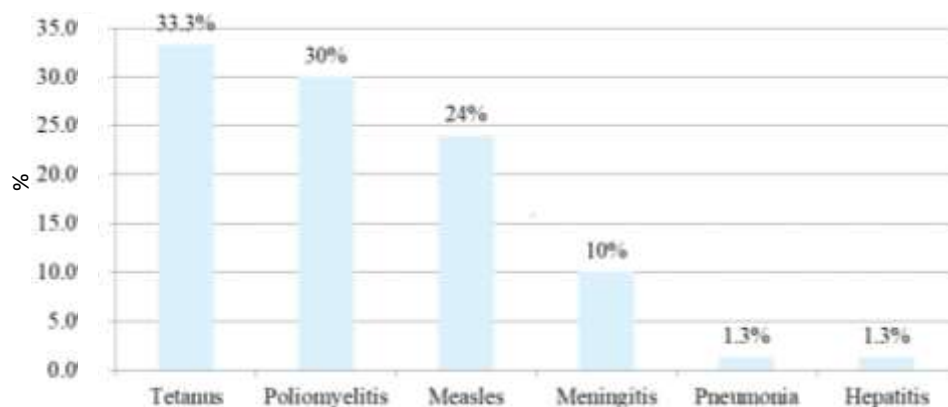


Figure 3. Mothers/caregiver knowledge regarding vaccine preventable disease.

Table 2. Immunization status and starting time of vaccination.

Variable	Frequency	Percent
Immunization status of child		
Fully vaccinated	130	75.4
On vaccination process	25	14.5
Not vaccinated	17	10.1
Starting time of vaccination		
At birth	64	37.3
At 6 week	87	50.3
At 10 week	12	6.8
At 14 week	8	4.4
Other	2	1.2
Place of vaccine service		
Immunization campaign	93	53.6
Health center	66	38.1
Health post	14	8.4
Time take from home to immunization site		
<5 min	3	1.9
5-15 min	92	52.9
16-25 min	35	20
26-35 min	36	20.6
36-45 min	8	4.5

and 2(1.3%) of the respondents knows that tetanus, poliomyelitis, measles, meningitis, pneumonia and hepatitis are vaccine preventable diseases (Figure 3).

Immunization status

One hundred thirty (75.4%) of the children were completely vaccinated and 87(50.3%) of the children were vaccinated starting from 6 week. Ninety three

(53.6%) of the respondent children get immunization service during immunization campaign. For the 92(52.9%) respondents, it took 5 to 15 min to go to the immunization site (Table 2).

Immunization schedule adherence

Twenty two (12.9%) of the children missed appointment day. Nine (45%) of the respondents took the child to the

Table 3. Mothers/ care givers EPI schedule adherence and problems faced.

Variable	Frequency	Percent
Missed vaccine appointment day(n=173)		
Yes	22	12.9
No	151	87.1
Measurement taken for missed vaccine appointment(n=20)		
Missed for ever	8	40
Go to health institution immediately	9	45
Go to health institution in next appointment day	3	15
Mothers/caregiver return without vaccinate their child after go to health institution(n=173)		
Yes	19	11
No	153	89
Reason of Mothers/caregiver to return (n=19)		
Absence of responsible health worker	6	33.3
Bad behavior of health worker	1	5.6
Presence of many attendant	12	61.1
Interrupted vaccine program(n=173)		
Yes	13	7.7
No	160	92.3
Reason of interruption (n=13)		
Unawareness about the need to return	7	50
Child sick in the time of vaccination	3	25
Far distance of immunization site	3	25
Problem happen during vaccination period(n=173)		
Yes	30	17.4
No	143	82.6
Problem that happen during vaccination(n=30)		
Ulcer at site of injection	17	55.6
Fever	13	44.4
Measurement taken(n=30)		
Took the child to health institution	8	25.9
Interrupt the next immunization schedule	2	7.4
Took to traditional healer	9	29.6
Other	11	37

health institution immediately when they remember that they miss the appointment. Nineteen (11%) returned due home without using the service. Twelve (61.1%) of them returned home due to the presence of many attendants. 13 (50%) of respondent had interrupted vaccine program

due to unawareness about the need to return the next dose. Thirty (17.4%) of the respondents reported that the children vaccinated had a problem during the vaccination period and 17(55.6%) experienced ulcer at the site of children to the health institution for treatment (Table 3).

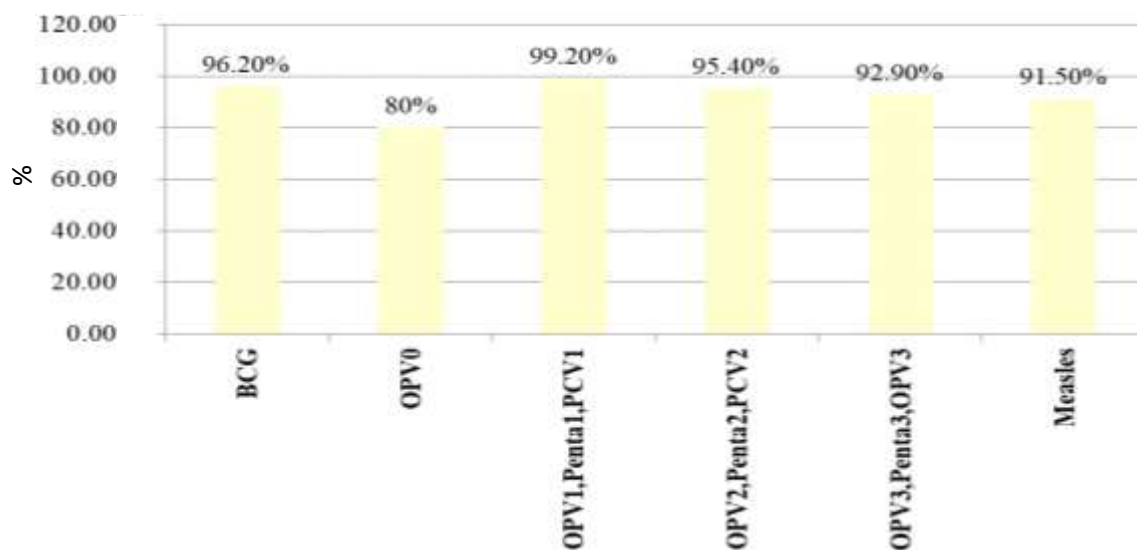


Figure 4. Vaccination coverage of children for each vaccine of 12 to 23 months of children.

Types of immunization

Of the vaccinated children 166(96.2%) vaccinated for BCG, 138(80%) vaccinated for opv0, 129 172(99.2%) OPV₁, Penta₁ and PCV₁, 165(95.4%) vaccinated for OPV₂, Penta₂ and PCV₂, 161(92.9%) vaccinated for OPV₃, Penta₃ and PCV₃, and 158(91.5%) vaccinated for Measles (Figure 4).

DISCUSSION

The study showed that 75.4% children of 12 to 23 months of age were fully vaccinated. This finding is comparable to a finding from a study conducted in Tamil Nadu in which 76% of children were fully vaccinated (Murugesan et al., 2017) and in Kenya which reported that 76.6% were fully vaccinated (Maina et al., 2013). On the other hand this finding is lower than a report from a study conducted in India which showed that 80.7% (Chaudhari et al., 2016) were fully vaccinated. It is also lower than a finding from a study done in Rims, Ranchi (87.3%) (Vidyasagar et al., 2017). This difference could be reacted to a difference in the level of intervention done to address the issue of immunization coverage in the study areas.

Furthermore, the finding is higher than a report from studies done in Allahabad district 31% (Masood et al., 2011), 57% India (Shrivastwa et al., 2015), 65.4% Zimbabwe (Mukungwa et al., 2015) and hosanna 30.51% (Ayano et al., 2015). This might be due to the fact that in the study area immunization is currently delivered in the form of community outreach program which is supported by the health extension workers. Therefore, access to the service increased. In addition, health education is

delivered to the community through the community based training programs.

In this study the overall drop out was 4.7%. This finding is comparable to a finding from a study conducted in Debre markos town, Amhara Regional State, Ethiopia which reported the overall dropout was 5% (Gualu et al., 2017). The finding is lower from a report from a study conducted in Bareilly District 37.3% (Joshi et al., 2011). This might be related to the difference in the delivery of the service in the two study areas. There might be a difference in the interventions applied to the increase the access to the immunization service. The difference in year at which the studies conducted might also contribute to the difference. Currently, due to increased provision of information and advancement of community engagement in the health care, the community is more likely to use the service.

In this study, among children aged 12 to 23 months 10.1% were not vaccinated. This is lower than a finding from a study conducted in Jiggiga District, Somali National Regional State, Ethiopia which reported that 25.4% of children were not vaccinated at all (Mohamud et al., 2014). The discrepancy might be due to a difference in study setting. The vaccination coverage is different in the study areas. According to a national report, in Somalia the vaccination coverage is only 22%. As compared to other vaccines coverage, the BCG vaccine was high. Accordingly, 96.2% were vaccinated for BCG. This could be due to the fact that it is administered at the time of delivery inside the health institution. There is a decrease in the vaccination coverage from BCG to measles in which only 91.54% children were vaccinated for measles. This could be due to lack of intention to use the service, far distance of health facilities and lack of continuous encouragement.

Conclusion

Only half of the children's were fully vaccinated and majority was vaccinated during immunization campaign. The main written source of information for the mothers or caregivers was leaflets. Continuous support and health education should be provided at the community level. At individual level, frequent follow-up of a change in attitude and knowledge is essential. Especially the health promotion should focus on the returning of children for another dose of vaccination. Furthermore, health institutions should work to improve the quality of vaccination care.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Full Length Research Paper

Assessment of public knowledge, attitude and practices towards rabies in the community of Kombolcha, Southern Wollo, Amhara Regional State, Ethiopia

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The study was conducted from November 2016 to April 2017 in 12 kebeles (the smallest administrative unit of Ethiopia) of Kombolcha, Southern Wollo Amhara Regional State, Ethiopia. The aims of the study were to assess the knowledge, attitudes and practices (KAP) of Kombolcha's community toward rabies and associated risk factors. A cross-sectional study design and multistage sampling procedures were employed to select households for the study. Kebeles were randomly selected using lottery method from list of kebeles in the study area, followed by selection of households from each kebele by systematic random sampling. Data were collected from 384 households through face to face interview using pre-tested and well-structured questionnaires. Socio-demographically, out of the 384 respondents interviewed, 223 (58.1%) were males and 161 (41.9%) were females. From 384 respondents, 345 (89.8%) had heard about rabies before and the majority of the study participants, 329 (85.7%) had good level of KAP. There were statistically significant associations ($p < 0.05$) between KAP scores and age, house hold size, educational status, and occupation. In conclusion, the study revealed that, Kombolcha's community has good knowledge, attitude and practice toward rabies. However, there are some inconsistencies on mode of transmission, symptoms, appropriate prevention and treatment measures. Therefore, continuous and strategic health programs are expected from health professionals, governmental and non-governmental organizations to control and prevent the disease and secure rabies free zone.

Key words: Attitude, community, knowledge, kombolcha, practice, rabies.

INTRODUCTION

Rabies is a zoonotic, fatal and progressive neurological infection caused by rabies virus of the genus Lyssavirus

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and family Rhabdoviridae. It affects all warm-blooded animals and the disease is prevalent throughout the world and endemic in many countries except in Islands such as Australia and Antarctica. Over 60,000 peoples die every year due to rabies, while approximately 15 million people receive rabies post-exposure prophylaxis (PEP) annually and transmitted mostly by carnivores to humans and livestock (Singh et al., 2017; Reta et al., 2014).

Despite of global vast attempt and implementation of extensive control schemes and public health awareness programmers about rabies, still over 95% of the mortality happens in Asia and Africa, where canine rabies is enzootic (WHO, 2013). In many developing countries like Ethiopia and Nigeria, mortality in humans due to rabies infection are low because of under-reporting, cultural beliefs, poor or inadequate rabies diagnostic units and poor knowledge on the mode of transmission and prevention of the disease (Otolorin et al., 2015). Under-reporting of rabies in endemic developing countries has resulted in the disease being ignored by medical professionals and subsequently poor assistance from international community and donor agencies (Otolorin et al., 2015).

Besides human mortality, rabies has significant effects on livestock economy. For example in Africa, rabies is a potential problem for cattle production in free-range production systems, such as the mixed crop-livestock and pastoral production systems, where dogs are kept close contact with cattle (Sillero-Zubiri et al., 2004; Jibat et al., 2016). Therefore, due to this circumstance, rabies has extensive economic impacts at the household and country levels (Okell et al., 2013; Jibat et al., 2016).

In Ethiopia, many households own dogs usually for guarding purpose. Although there are no formal documented studies, it is estimated that there is one owned dog per five households nationally (Deressa et al., 2010). Dog management is often poor and vaccination is limited to dogs in urban centers. The high population of dogs with poor management contributes to high endemic nature of canine rabies in the country (Jemberu et al., 2013). Individuals who are a victim of rabies virus often visit traditional healers for the diagnosis and treatment of the disease. These widespread traditional practices of handling rabies cases are believed to interfere with timely seeking of PEP. Rabies victims, especially from rural areas, seek PEP treatment after exhausting the traditional medicinal intervention and usually after a loss of life from family members (Tadesse Guadu, et al., 2014).

Poor public awareness towards rabies is considered as one of the bottle necks for the prevention and control of the disease in Ethiopia. Understanding communities' perceptions of causes, mode of transmission, symptoms, treatments and possible intervention measures of rabies

are an important step towards developing strategies aimed at controlling the disease and determining the level of implementation of planned activities in the future. Hence, the objectives of this study were to assess the level of knowledge, attitudes, and practices of selected communities of Kombolcha and identifying factors associated with community knowledge, attitude and practice toward rabies in the study area. All the obtained information are vitally important in the prevention and control of rabies in Kombolcha and the country in general.

MATERIALS AND METHODS

Study area

The study was conducted in Kombolcha, North Wollo zone of Amhara Regional State, Ethiopia from November, 2016 to April, 2017. Geographically, Kombolcha is located in North Eastern part of Ethiopia at a distance of 379 km from the capital city, Addis Ababa at 11°4' 37"N and 39°44'42"E. The area has an altitude range of 1500 to 1840 m above sea level. The region is marked by numerous mountains, hilly, sloppy and plateaus areas having rivers and streams. There are three topographic categories; 14% high altitude-dega, 34% mid highland-weinadega, and 52% of low altitude-kola. The area experiences a bimodal rainfall with a minimum annual rainfall of 750 to 950 mm and a relative humidity of 23.9 to 79%. The average monthly recorded minimum and maximum temperatures were 13.6 and 27.8°C, respectively (CSA, 2013). Livestock population of the area comprises 20983 cattle, 22115 sheep, 37053 goats, 5712 horses, 1464 mules, 10248 donkeys, 3451 camels, and 348612 poultry (SWZARO, 2014).

Study population and study design

This study was done on community of Kombolcha town live in 12 kebele. A total of 384 people were selected from all age groups and both sexes. A cross-sectional quantitative study was carried out from among the community to study the knowledge, attitudes and practices (KAP) of the public toward rabies.

Sample size, sampling method and procedures

Sample size determination

Since there is no awareness study on rabies in the area before, the required sample size for this study was estimated by considering 50% of populations' knowledge about rabies. Thus, the sample size was calculated according to the formula given by Thrusfield (2005) using 95% confidence interval and 0.05 absolute precision.

$$n = 1.96^2 \times P_{exp} (1 - P_{exp}) / d^2$$

where n = required sample size, P_{exp} = Expected proportion of population knowing about rabies (50%), and d^2 = Desired absolute precision (0.05).

Based on the formula, a total sample size of 384 was determined.

Sampling method and procedures

A multi-stage sampling technique was employed for the selections of the sampling units. The primary sampling units were kebeles and the secondary sampling units were households. From the entire primary sampling units (out of 12 kebeles), five kebeles were selected by simple random sampling technique. The individual households from the selected kebeles were selected using a systematic random sampling technique. The numbers of households to be included in each kebele were determined by a proportional allocation based on the total number of households found in each kebele.

Method of data collection

Information on the knowledge, attitude and practices of the residents is collected by a well-structured questionnaire consisting of 32 close-ended questions. The participants of the study were asked to properly fill the answers for each question on the questionnaire. The questionnaire has two sections. The first is targeted at the socio-demographic situations of the respondents like sex, age, house hold size, educational status occupation, and religion. The other part is rabies related questions, consisted of knowledge on the causes, mode of transmission, knowledge on clinical signs and fatal nature of rabies, practices and attitudes to control and prevent rabies during and after the suspected animal and other rabies related questions. The data were collected via face to face interview. The questionnaire was first developed in English and then translated to Amharic language (native language) for appropriateness and easiness in approaching the study participants.

Data management and analysis

After collecting, the data were cleaned and checked for its completeness. Those incomplete and inconsistent were corrected when possible and removed otherwise. After complete check-up, the data were coded and entered to Microsoft Excel and exported to SPSS version 20.0 statistical packages for windows and analysis was made. The frequency distribution of both dependent and independent variables were worked out by using descriptive statics techniques (Frequencies and percentage). Association between independent variables and KAP scores on rabies was calculated using Pearson's Chi square.

Ethical approval

The study collected responses from people about knowledge, attitudes and practice toward rabies. No animal was involved and subjected to suffer. Nevertheless, ethical approval was conducted by research ethical approval committee of University of Gondar, College of Veterinary Medicine and Animal Sciences.

RESULTS

Socio-demographic characteristics

A total of 384 respondents were responded to the questionnaire, which yielded a response rate of 100%. More than half of the total study population, 223 (58.1%) were males and 170 (44.3%) were between 15 and 25

age groups. Out of the 384 samples taken, 187 (48.7%) were from the family size of greater than six person and 136 (35.4%) of them had completed a first degree education and above followed by college diplomas, 106 (27.6%). From the total respondents, 124 (32.3%) were government employees followed by private employees, 117 (30.5%) and 218 (56.8%) were Muslim followed by Orthodox, 120 (31.2%) in religion, and 345 (89.8%) of the study participants had information on rabies. Out of the 345 samples, 144 (37.5%) have got the information from mass media (Radio/Television, Books/Magazines), and 106 (27.6%) from health as well as veterinary professionals and 95 (24.8%) of respondents heard about rabies from informal sources such as traditional healers and society. Moreover, 321 (83.6%) of the samples got training about rabies.

Community KAP about rabies in Kombolcha town

Thirty-two questions were enquired for each respondent regarding the cause, sources, mode of transmissions, clinical signs, prevention practices and treatment measures of rabies. The number of questions for which the respondent gave correct responses was counted and scored. This score was then pooled together and the average score was computed to determine the overall KAP of respondents, respondents who score greater than or equal to the average value grouped to good KAP and less than the average value poor KAP level. The data revealed that about 329 (85.7%) of the study participants were found to have good KAP toward rabies and 55 (14.3%) were found to have poor KAP level.

Knowledge of participants related to cause, mode of transmissions and host range of rabies

Majority of the respondents, 294 (76.6%) knew that virus is the cause of rabies. From 384 respondents, 243 (63.3%) said rabies affects brain while the rest of respondents, 29.7% knew that it affects the stomach and the bitten area. Most of the respondents, 272 (70.8%) have information that rabies transmitted from animal to human by biting and the remaining participants, 29.1% knew that transmission is by scratching and other route of transmission. Two hundred and eighty (72.9%) respondents knew that all species were susceptible to rabies. From 384 respondents, 317 (82.6%) respondent were aware that dog is the most common source of rabies followed by cat 24 (6.2%) (Table 1).

Knowledge of participants related to clinical signs and fatal nature of rabies

Three hundred and fifty-seven (93%) of the study

Table 1. Knowledge of participants related to cause, mode of transmissions and host range of rabies in Kombolcha, southern Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/Number	Proportion (%)
Causes of rabies *		
Psychological problem	29	7.6
Associated with religion	36	9.4
Virus	294	76.6
Shortage of feed and water	21	5.5
I do not know	4	1.0
Modes of transmission		
Biting	58	15.1
Scratching	30	7.8
Wound Licking	24	6.2
All	272	70.8
Susceptible hosts		
Human	53	13.8
Dog	15	3.9
Cat	8	2.1
Cattle	18	4.7
Sheep and Goat	5	1.3
Equines	3	0.8
Wild animals	2	0.5
All of these	280	72.9
Most common source of rabies **		
Dog	317	82.6
Cat	24	6.2
Cattle	16	4.2
Sheep and goat	7	1.8
Equine	8	2.1
Wild animal	8	2.1
I do not know	4	1.0

*Causes of rabies as it is believed by the respondents. **The source of infection from animals as incriminated leading to rabies in opinion of the respondents.

participants answered that rabies is a dangerous and fatal disease. The majority of the respondents 91.1% replied that rabies is not easily treatable after the onset of the clinical sign (Table 2).

Practices and attitudes to prevent rabies after suspected animal/dog bite

The majority of respondents (92.4%) washed the wound with water and soap immediately after bitten by a rabid

animal. 89.3% seek health center after bitten by a rabid animal. The majority of respondents 89.8% had a positive attitude for PEP and 325 (84.6%) were aware of taking PEP vaccine immediately after being bitten by a suspected animal/dog. The majority of the respondents, 323 (84.1%) answered that killing the rabid animals and 59.3% responsive to stray dogs control. Most of the respondents (81.2%) reacted that timely vaccination prevents animals from a suspected dog bite. In a general scenario, the respondents in this study had a good level of practice (89.1%) and attitude (79.9%) towards rabies

Table 2. Knowledge of participants related to clinical signs and fatal nature of rabies in Kombolcha Southern Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/number	Percent
Clinical signs of rabid animal		
Stops eating and drinking	40	10.4
Biting and change in behavior	36	9.37
Paralysis	13	3.38
Salivation	16	4.1
Hydrophobia	9	2.3
All	210	54.6
Easily treated after the onset of clinical signs		
Yes	29	7.5
No	350	91.1
I don't know	5	1.3
Fatal nature of the rabies		
Yes	357	93
No	27	7.0
Group of population at higher risk		
Young	52	13.5
Adult	34	8.9
Male	28	7.3
Female	13	3.4
All	257	66.9
Fate of a person bitten by a rabid animal and didn't visit health centers		
He/She will die	331	86.2
He/She will remain sick	48	12.5
Nothing happens	4	1.0
I don't know	1	0.3

(Table 3).

Factors associated with community KAP on rabies in Kombolcha town

Association between independent variables and KAP scores toward rabies was calculated with Pearson's Chi square shown in Tables 4, 5, 6 and 7. There was significant association between KAP scores and age, house hold size, educational status and occupation ($p < 0.05$). The good scores were higher in 41 to 60 age groups, 85.8% among other age groups ($\chi^2 = 8.752$, $p < 0.033$). Educational status was significantly associated with KAP scores ($\chi^2 = 1.868$, $p < 0.000$). The good scores

were higher in the first degree and above. Occupation is also significantly associated with KAP scores ($\chi^2 = 29.807$, $p < 0.000$) (Table 7).

DISCUSSION

The result of this study revealed that 85.7% of the study participants had a good level of knowledge, attitude and practice (KAP) toward rabies, which is supported by report from Sri Lanka (Gino et al., 2009). This result is higher than the result obtained from study conducted by Tadese et al. (2014) in Bahir Dar and Shumuye et al. (2014) in Gondar area accounting 65% of KAP score. This variability probably due to the difference in the area,

Table 3. Practices and attitudes to prevent rabies after suspected animal/dog bite in Kombolcha town (N=384) Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Characteristics	Frequency/Number	Percent
Immediate action after bitten by rabid animal at home***		
Tie the wound	26	6.8
Wash with water and soap	355	92.4
No any action will be taken	3	0.8
Seek after bite of rabid animal****		
Health center (go clinic)	343	89.3
Traditional healer	26	6.8
Holly water	12	3.1
Nothing	3	0.8
Attitude to anti-rabies vaccine		
Positive	345	89.8
Negative	39	10.2
At which stage of anti-rabies vaccine is effective after a suspected animal bite		
Immediately (post exposure)	325	84.6
Later	16	4.2
At any time	29	7.6
I don't know	14	3.6
Actions taken on rabid animals		
Let free	8	2.1
Tie	48	12.5
Killing	323	84.1
Nothing	5	1.3
Measures to control stray dogs		
Killing	21	5.5
Animal birth control	6	1.56
Aware the Society	228	59.3
Ting	5	1.3
Prevention animals from rabid animal		
Tying dogs always	31	8.1
Providing fresh food and water	20	5.2
Timed vaccination	312	81.2

Immediate action done after the person is beaten at home. * The preference of treatment option for a person beaten and suspected of rabies case.

socio-demographic differences, lack of health education programs and community awareness on the case.

Majority of the respondents (89.8%) had heard about rabies from different information sources such as mass media radio/TV and magazine (formal source). However, such information tended to be superficial and highlight, it

did not adequately enable public to acquire an appropriate level of knowledge and awareness about rabies and related cases. The finding of this study is higher (68.7%) than in a survey of knowledge, attitudes and practices about the animal bite and rabies in general community of India and Zimbabwe conducted by Brooks (1990) and

Table 4. Relationships between knowledge scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good (%)	Poor (%)	Total	χ^2	P-value
Sex					
Male	183 (67.5)	40 (32.5)	123	0.231	0.631
Female	129 (80.2)	32 (19.8)	161		
Age (in years)					
15-25	137 (80.6)	33 (19.4)	170	2.737	0.434
26-40	64 (86.5)	10 (13.5)	74		
41-60	96 (80.7)	23 (19.3)	119		
>60	15(71.5)	6 (28.5)	21		
Household size					
1-3	81 (79.5)	21 (20.5)	102	3.836	0.147
4-6	72 (75.5)	23 (24.5)	95		
>6	159 (85.1)	28 (14.9)	187		
Educational status					
Illiterate	12 (36.4)	21 (63.6)	33	70.674	0.000
Primary school (1-8)	32 (69.6)	14 (30.4)	46		
Secondary school (9-10)	45 (71.5)	18 (28.5)	63		
College	97 (91.6)	9 (8.4)	106		
First degree and above	126 (92.7)	10 (7.3)	136		
Occupation					
Government employees	104 (83.9)	20 (16.1)	124	8.042	0.154
Private employees	100 (85.5)	17 (14.5)	117		
Merchant	37 (68.6)	17 (31.4)	54		
Unemployed	20 (77)	6 (23)	26		
House wife	23 (82.2)	5 (17.8)	28		
Student	28 (80)	7 (20)	35		
Religion					
Orthodox	95 (79.2)	25 (20.8)	120	1.636	0.651
Muslim	181 (83.1)	37 (16.9)	218		
Protestant	29 (80.6)	7 (19.4)	36		
Catholic	7 (69.7)	3 (30.3)	10		

Sudarshan (2007), respectively. However, KAP level of these countries is higher. This difference is mainly associated with the source of information determining the appropriateness of the knowledge transferred to the general public.

Out of the total surveyed participants, 22.5% had a misunderstanding about the causes of rabies. The outcome is lower than report achieved from a study conducted in Bahir Dar city, which indicated that most of the respondents (39.9%) believe that the disease in dogs

is initiated by starvation, thirst and prolonged exposure to sun heat (Tadese et al., 2014). This study also stated that the majority of the respondents (70.8%) knew the correct mode of transmission. The recording of the present study is higher than the report from Debre Tabor (57.8%) (Awoke et al., 2015). Differences in sources of information could be justification for the variability of this result.

An estimated 93% of the total respondents recognized rabies as danger and a fatal disease, 72.9% knew that all warm blooded animals are susceptible to rabies and

Table 5. Relationships between attitude scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	χ^2	P- value
Sex					
Male	178 (79.9)	45 (20.1)	223	0.005	0.942
Female	129 (80.2)	32 (19.8)	161		
Age (in years)					
15-25	146 (85.9)	24 (14.1)	170	13.796	0.003
26-40	51 (69)	23 (31)	74		
41-60	97 (81.6)	22 (18.4)	119		
>60	13 (62)	8 (38)	21		
Household size					
1-3	76 (74.6)	26 (25.4)	102	3.349	0.187
4-6	75 (79)	20 (21)	95		
>6	156 (83.5)	31 (16.5)	187		
Educational status					
Illiterate	2 (6.1)	31 (93.9)	33	2.062	0.000
Primary school (1-8)	20 (43.5)	26 (56.5)	46		
Secondary school (9-10)	46 (73.1)	17 (26.9)	63		
College	103 (97.2)	3 (2.8)	106		
First degree and above	136 (100)	0 (0)	136		
Occupation					
Government employees	113 (91.2)	11 (8.8)	124	38.247	0.000
Private employees	100 (85.5)	17 (14.5)	117		
Merchant	31 (57.5)	23 (42.5)	54		
Unemployed	19 (73.1)	7 (26.9)	26		
House wife	23 (82.2)	5 (17.8)	28		
Student	21 (60)	14 (40)	35		
Religion					
Orthodox	96 (80)	24 (20)	120	1.003	0.801
Muslim	172 (78.9)	46 (21.1)	218		
Protestant	31 (86.2)	5 (13.8)	36		
Catholic	8 (80)	2 (20)	10		

82.6% informed that dogs are the most common source of rabies. This result is consistent with a study conducted in New York City, USA which reported 94.1% of the study participants knew rabies as a killer disease and 13.8% of the respondents identified dogs as major sources for the spread of rabies in the human population (Hosmer and Lemeshow, 2000). Moreover, 54.6% of the respondents were aware of common clinical signs of rabies in animals. This finding is in line with a study conducted by Asabe et al. (2012) in Nigeria. The result indicated that 27.1% had a misunderstanding on the range of host that rabies could affect and 50.3% of the respondents were aware of

common clinical signs of rabies in humans. In agreement with Awoke et al. (2015), the majority of the respondents (66.9%) knew that rabies can affect all group population regardless of individual background.

The finding in the current study reported that 92.4% of the respondents were aware of the fact that wound washing is an immediate post exposure (after dog bite) action. This result agreed with a study conducted in south-central Bhutan (Tenzin et al., 2012). But, higher than a study done in Bahir Dar (70.8%) (Tadese et al., 2014). This difference might be due to the perceptions, respondents believed that the infection could be treated

Table 6. Relationships between Practice scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	χ^2	P-value
Sex					
Male	201 (90.2)	22 (9.8)	223	0.627	0.428
Female	141 (87.6)	20 (12.4)	161		
Age (in years)					
15-25	162 (95.3)	8 (4.7)	170	15.528	0.001
26-40	60 (81.1)	14 (18.9)	74		
41-60	104 (87.4)	15 (12.6)	119		
>60	16 (76.2)	5 (23.8)	21		
Household size					
1-3	88 (25.7)	14 (13.7)	102	6.159	0.046
4-6	80 (84.3)	15 (15.7)	95		
>6	174 (93.1)	13 (6.9)	187		
Educational status					
Illiterate	7 (21.3)	26 (78.7)	33	1.856	0.000
Primary school (1-8)	37 (80.5)	9 (19.5)	46		
Secondary school (9-10)	58 (92.1)	5 (7.9)	63		
College	106 (100)	0 (0)	106		
First degree and above	134 (98.6)	2 (1.4)	136		

with herbs and traditional healer. Out of all respondents, 89.3% of them seek medical care from health centers after being bitten by dogs, which is contrary to a study conducted in Dabat, Gondar, which reported that 84% of respondents used traditional medicine when exposed to the disease (Jemberu et al., 2013). This high variance could be as a result of lack of information, unavailability of health centers in the immediate vicinity and community perceptions toward health centers for rabies as well as their preference of traditional medicines than health centers for rabies cases. However, this report agreed with study from Sri Lanka, where almost all respondents consult health professionals in case of animal bite (Matibag et al., 2009).

An estimated 59.3% of the respondents in the present study indicated that the society is aware that the control of stray dogs is an effective measure for controlling and prevention of the disease in Kombolcha town. This finding agree with results recorded in Sri Lanka in which the majority of the participants were in favor of rabies control programs that mainly focused on stray dog population control (Gino et al., 2009). Furthermore, the majority of the respondents, 89.8% reported positive attitude to anti rabies vaccine and this is an indication of their willingness to vaccinate their pets and believe that vaccination program and depopulation of stray dogs are

effective measures for controlling the disease in Kombolcha. The finding of the present study was also in consistence with results recorded in Sri Lanka, where the majority of the participants were in favor of rabies control programs that mainly focused on stray dog population control (Gino et al., 2009). The mainstream of the respondents (81.2%) already knew that rabies could be prevented by timed vaccination of dogs against the disease. This was similarly recorded (88.1%) by Gino et al. (2009).

This study indicated that the majority of the respondents had good level of knowledge (81.2%), attitude (79.9%) and practice (89.1%) towards rabies. This finding was higher than previous reports such as Ali et al. (2013) who obtained relatively lower proportion of knowledge (75.2%), attitude (52.3%) and practice (67%) in Addis Ababa, Ethiopia. However, a higher knowledge, more positive attitudes, and higher scores in practice regarding rabies were reported by Gino et al. (2009) relative to this finding. The variability of these studies could be due to factors such as lack of health education programs on the case, endemic nature of the disease, geographical and socio-demographical phenomena.

Relatively better KAP scores were higher in age group of 41 to 60 (85.8%) and there was statistical significant association ($p < 0.05$) among the age groups. This relative

Table 7. Relationships between KAP scores about rabies and some key independent variables among study respondents of Kombolcha Wollo, Ethiopia (N=384), from November 2016 to April 2017.

Variable	Good	Poor	Total	χ^2	P-value
Sex					
Male	192 (86.1)	31 (13.9%)	223	0.077	0.781
Female	137 (85.1)	24 (14.9%)	161		
Age (in years)					
15-25	152 (89.5)	18 (10.5)	170	8.752	0.033
26-40	61 (82.5)	13 (17.5)	74		
41-60	102 (85.8)	17 (14.2)	119		
>60	14 (66.7)	7 (33.3)	21		
Household size					
1-3	81 (79.5)	21 (20.5)	102	8.422	0.015
4-6	78 (81.1)	17 (17.9)	95		
>6	170 (81)	17 (9)	187		
Educational status					
Illiterate	4 (12.2)	29 (87.8)	33	1.868	0.000
Primary school (1-8)	36 (78.3)	10 (21.7)	46		
Secondary school (9-10)	49 (77.8)	14 (22.2)	63		
College	106 (100)	0 (0)	106		
First degree and above	134 (98.6)	2 (1.4)	136		
Occupation					
Government employees	117 (94.4)	7 (5.6)	124	29.807	0.000
Private employees	106 (90.6)	11 (9.4)	117		
Merchant	36 (66.7)	18 (33.3)	54		
Unemployed	20 (77)	6 (23)	26		
House wife	23 (86.2)	5 (17.8)	28		
Student	27 (87.2)	8 (22.8)	35		
Religion					
Orthodox	100 (83.3)	20 (16.7)	120	1.628	0.653
Muslim	191 (87.1)	27 (22.9)	118		
Protestant	30 (83.3)	6 (16.7)	36		
Catholic	8 (80)	2 (20)	10		

better KAP score among the older age groups could be as a result of increased curiosity, reading capacity and learning and life experiences.

Education is one the best methods for knowledge delivery. Educated individuals would have better information access, like access to hear, listen, print and read from electronic media or any other sources which occasionally give information about rabies, and can easily understand the disease. It seems, as finding of this research, education played very significant role for KAP. Statistically significant association ($p < 0.05$) was observed between KAP score and educational status

where by higher levels of education were associated with higher KAP scores. All respondents with first degree and above had good level of KAP (98.6%) about the case of rabies. Similar results were recorded by previous researches such as Tadese et al. (2014) in Bahirdar city.

It is a general fact that, the types of occupations matter on KAP scores in any cases. The present study statistically proved the fact that, the types of occupations play significant role to KAP scores ($p=0.000$) on rabies. The probable justification could be types of the works, sharing of information between different people with different experience, status and social background, which

might be important factors for higher KAP score obtained.

There was no strong association between KAP scores and sex of respondents ($\chi^2 = 0.077$, $p = 0.781$). The reasons could be that it is known that dog is the famous pet animal that live with human being for a long period of time in history and people raised dog for house guard and protection. Therefore, both sexes have equal opportunity of contacting and exposure to dogs.

The number of individual's in a given household (house hold size) plays significant role in KAP score. This significant association ($p < 0.05$) is suggested to be, as an increment of household size, the information access or information sharing would be better among the family members, who could have different occupations and educational status.

The types of religions, which the respondents follow plays insignificant role in KAP score ($p > 0.05$) this is to mean that all individuals from different religious groups live in the same community with the same exposure for dog, information and any other rabies related issues.

Conclusion

The findings of this study revealed that Kombolcha's community has better KAP toward rabies and related issues. Majority of the community knew the fatal nature of rabies and its zoonotic importance. Almost all of the study participants had heard about the disease from different information sources and the majority of the study participants knew dog as the main species affected and responsible for the disease in humans mainly through bite. Age, house hold size, educational status, and occupational background of the respondents were the most important factors that play significant role in higher KAP score in Kombolcha's community. Even though KAP score in Kombolcha's community revealed to be good, awareness creation in the community should be continued. Different strategic programs on the prevention and control of rabies should be designed by governmental and none governmental organizations. While giving proper post exposure anti rabies vaccine, surveying rabies cases in human in different health centers in Kombolcha town provide future research warranty, which will escalate one health concept.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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