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By Zemenu Yowhanes, Hailemariam Berhe & Desta Hailu

Arba Minch University

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A total of 521 students were included in the study, making a response rate of 97%. Three hundred (57.6%) adolescents discussed about at least one sexual and reproductive health issues with their parents. Educational status of adolescents' parents, students' living arrangement and level of education of respondents were found to be independent predictors of adolescents' communication.

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Assessment of Parent-Adolescent Communication about Sexual and Reproductive Health among High School Students in Mekelle Town, Northern Ethiopia

Zemenu Yowhanes ^α, Hailemariam Berhe ^σ & Desta Hailu ^ρ

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I. INTRODUCTION

According to world health organization (WHO), the term "adolescence is defined as period of life between 10-19 years [WHO, 2013; Society for public health education; WHO, 2012]. It represents a unique period of life characterized by significant physical, cognitive, emotional and social changes [CDC, 2004]. It is a transitional period from child hood to adult hood [WHO, 2014] marked by increasing levels of individual autonomy, growing sense of identity and self-esteem and progressive independence from adults [Save the children, 2009].

Traditionally, these group of people have commonly been regarded as healthy segment of the community and little attention have been given since the health care system was almost exclusively adult centered [Georg, 2012]. However, it is a period when health problems that have serious immediate consequences and behaviors that could have long

lasting adverse effects on their future are initiated [WHO, 2010; CDC, 2007]. Because of the rapid physical, cognitive, and emotional developments that takes place before adequate information, skills and experience of life is achieved, adolescence is a time when many health problems first emerge unless managed properly [CDC, 2007; WHO, 2006].

The health status of adolescents is strongly connected to a number of risk behaviors, which are often established during the adolescent years that end in chronic and non-chronic diseases. These behaviors include: substance abuse, unhealthy dietary behaviors, inadequate physical activity, violence, risky sexual behaviors that contribute to unintended pregnancy and sexually transmitted infections including HIV infection [Society for Public Health Education,2012; WHO,2006].

One third of women worldwide give birth before the age of 20 each year and are at increased risk of morbidity and mortality due to obstetric complications. Annually, 5,000,000 and 70,000 adolescents between the ages of 15 and18 have unsafe abortions and abortion related deaths respectively [EFDR, 2004]. Moreover, adolescents are more likely to engage in a wide range of high risk sexual behaviors that can result in sexually transmitted diseases, including HIV [WHO, 2010].

Globally, One-third of all currently infected individuals are young people acquiring HIV infection every minute and more than 2.6 million each year [National center for Health Statistics, 2012].

In Ethiopia, like in other sub Saharan African countries, sexual and reproductive health problems of adolescents are high. Twelve percent of adolescent women are already mothers or pregnant with their first child [Central statistical agency, 2011] and 60% of adolescent pregnancies are unwanted or unintended [WHO, 2010].According to EDHS report, 1.9% and 3.8% of female and male adolescents had premarital sex respectively. Among those who have premarital sex only 45.5% women and 60% men used condom. This unsafe sexual intercourse leads to HIV prevalence of 0.2% among adolescent women [Central statistical agency, 2011].

Author α: Tigray regional state Health Bureau, Mekelle.

Author σ: Departments of Nursing, Mekelle University, Mekelle.

Author ρ: Department of Nursing, Arba Minch University, Arba Minch.
e-mail: destahailu19@gmail.com

The health, safety and well-being of adolescents are affected by a complex interplay of factors between the individual and their surroundings, such as parents, peers, neighborhood, schools, community, health care systems, media, social norms, policies and laws. These factors collectively impact young people's ability to appropriately make healthy decisions [Interagency youth Working Group, 2007]. Parents in particular play a critical role in sexual socialization of their children and in helping them weigh the consequences of their behaviors [Interagency youth Working Group, 2007; WHO, 2012]. Good family communication regarding sexual risk behaviors promotes knowledge, better sexual negotiation skills and self-efficacy [WHO, 2006; WHO, 2012] and has been associated with less engagement in risky sexual behaviors [Weinstein & And, 2011].

Despite its importance, communication about sexual and reproductive health is greatly influenced by the culture and social environment. Parent-adolescent communication remains challenging in many sub-Saharan African countries including Ethiopia as the social milieu in many traditional communities still limit. Initiating conversations about the sexual issues may be difficult for parents as they may be unsure as to how to approach such issues, doubt their competence in handling sexuality topics and the questions that may be raised by their adolescence or feel confused about the proper amount of information to offer [EFDR, 2004].

While parent-adolescent communication has critical role in preventing adolescents from engaging in risky sexual behaviors and promoting access to contraceptives and maternal health services, earlier studies in Ethiopia have paid limited attention to adolescent health and the level of communication is not well documented. The objective of this study therefore is to determine the level of parent-adolescent communication about reproductive and sexual health and associated factors among secondary and preparatory school students in Mekelle University.

II. METHODS AND MATERIALS

a) Study setting and period

This study was conducted from Jan 2013-August 2013 in Mekelle Town. Mekelle is located in the northern part of Tigray regional state, 783 Kilometers away from Addis Ababa, capital city of Ethiopia. It covers 28 square kilometers and has an estimated population of 289,756 [UNFPA, 2003]. The town has a total of 24 secondary and preparatory schools (eight governmental and sixteen private schools). The total number of students for the academic year 2012/2013 was 21,173. Of those, 45.1% and 54.89 were males and females respectively [Tigray region education bureau, 2013].

b) Study design and Population

A school based cross-sectional study involving qualitative method was undertaken among randomly selected unmarried adolescent students aged 10-19 who was attending secondary and preparatory school during the time of data collection. Mentally and/or physically incapable adolescents' students were excluded from the study.

c) Sample size determination and sampling procedure

Single population proportion formula was used to calculate the required sample size. Proportion of parent-adolescent communication about sexual and reproductive health [Tesso et al, 2012], margin of error, confidence interval, design effect and non-response rate were assumed to be 69.5%, 5%, 95%, 1.5 and 10%, respectively.

$$n_i = \frac{Z (\alpha/2)^2 P (1-P)}{d^2}$$

Where: n_i = Sample size; $Z (\alpha/2)^2$ = confidence interval; P = proportion of parent adolescent communication (0.695.); D = marginal of error

$$\text{Thus, } N_i = \frac{(1.96)^2 (0.695) (1-0.695)}{(0.05)^2} = 325$$

Finally, taking 10 % non-response rate and 1.5 design effect: $10 \% \times 325 = 358 \times 1.5 = 537$ participants were selected.

Multistage sampling technique was used to select the study subjects. First, all the schools in the town were stratified in to private and governmental. Then 3 out of 16 private and 3 out of 8 governmental schools were randomly selected. Then schools were further stratified by grade and section. Calculated sample size was proportionally allocated to private and governmental schools according to their number of students. Then, frames of students were developed from student roster of each grade in collaboration with instructors of respective classes. Students whose age range 10-19 years were selected using simple random sampling from the existing sampling frame (students' roster). In every step of selection simple random sampling technique was used.

d) Data collection tool and process

Structured self-administered questionnaire was prepared and utilized after reviewing relevant literatures. The main contents of the questionnaire were socio-demographic characteristics, knowledge of major reproductive and sexual health, sexual attitude and behavior, parental monitoring and communication with adolescents. The questionnaire was prepared in English and then translated to Tigrigna (local language). To check its consistency, it was back translated to English by an expert of both languages. After extensive

evaluation, final version of the questionnaire was developed.

Six 12th grade completed female interviewers who were fluent in the local language (Tigrigna) and are familiar with the local customs collected the data. Two diploma holder health care workers with similar work experience were assigned to supervise the data collection process.

Training was given for both data collectors and supervisors by the principal investigator for two days. The training session includes the general objective of the study; content of the questionnaire, ways how to keep confidentiality and privacy and ways how to resolve when a problem arises.

e) *Data Quality Control*

An individual who have the ability to speak and write both English and Tigrigna languages translated the questionnaire. In order to identify the clarity and consistency of the questionnaire it was pretested on 5% of the sample in a similar population in Wukro high school and preparatory school other than the schools in the study area and necessary modifications such clarity and consistency of questions and evidence based time allocation for each respondent were made accordingly. All the data collected from each respondent were checked for completeness, clarity and consistency by the principal investigator and the supervisors immediately at the end of each data collection days.

f) *Data processing and analysis*

Data were entered, coded and cleaned using SPSS version 16 software. Univariate analysis was computed for each independent variable to assess their individual proportion. Then, bivariate analysis was done to examine crude association of predictors on parent adolescent communication. Finally, by selecting eligible variables using forward logistic regression, the independent effect of predictors on parent- adolescent

communication about sexual and reproductive health were examined. Odds ratio and 95% CI were used to measure the statistical association. P value 0.05 was used to determine the statistical significance of the tests. Finally, the results were presented in texts, tables and graphs.

g) *Ethical Consideration*

After it was thoroughly reviewed, ethical approval was secured from Mekelle University college of Health Science (MUCHS) and permission to conduct the study was obtained from Tigray regional education bureau and management body of the respective school facilities. Informed written consent was obtained from each respondent. Involuntary participants were free to withdraw from the study. Questionnaires were coded instead of using names as identification and hence, confidentiality was assured throughout the study.

III. RESULTS

a) *Socio- demographic characteristics of adolescents*

A total of 521 respondents included in the study making a response rate of 97%. Sixteen questionnaires which were initially administered to respondents were excluded as they were incompletely &/or inconsistently filled. Thus, analysis was made based on 521 respondents. Among the study subjects, 231 (44.3%) were males and 290(55.7%) were females making the male to female ratio of 1 to 1.3. Mean age of respondents' was $16.59 \pm 1.33SD$ years ranging from 13-19 years. Tigray by ethnicity and Orthodox by religion were found to be 502 (96.4%) and 464 (89.1%) respectively. Majority 388 (74.5%) of the respondents were living with both of their fathers and mothers. Regarding the educational status of their parents, Only 108(20.8%) and 37(7.1%) of their mothers and fathers were illiterate respectively (table1).

Table 1 : Socio-demographic characteristic of adolescent students in Mekelle town, Tigray region, Ethiopia, 2013

Variable	Number	Percent
Sex		
Male	231	44.3
Female	290	55.7
Age		
10-14	22	4.2
15-19	499	95.8
Grade		
Grade 9	144	27.6
Grade 10	157	30.1
Grade 11	117	22.5
Grade 12	103	19.8
Type of school		
Private	66	12.67
Public	455	87.33

Religion		
Orthodox	464	89.1
Muslim	30	5.8
Others [†]	27	5.1
Ethnicity		
Tigray	502	96.4
Amhara	16	3.1
Others [‡]	3	0.5
Living arrangement		
With both parents	388	74.5
With mother only	88	16.9
With father only	13	2.5
With other relatives	10	1.9
With others [♣]	21	4
Mother's educational status		
Illiterate	108	20.8
Read and write	122	23.4
Primary (1-8)	46	8.8
Secondary (9-12)	87	16.7
12+	158	30.3
Father's educational status		
Illiterate	37	7.1
Read and write	105	20.2
Primary (1-8)	42	8.1
Secondary (9-12)	78	15
12+	206	28.4
Mothers Occupation		
House wife	208	39.9
Employed	157	30.1
Merchant	118	22.6
Farmer	7	1.3
Others [Ⓢ]	6	1.2
Family size		
<5 years	262	50.2
>=5years	259	48.8
Family income		
<500	4	0.8
500-1000	6	1.2
>1000	69	13.2
Don't know	442	84.8

*Aunt, grandparents, uncle, sister, brother; [†]Protestant, catholic; [‡]Oromo, Guragie; [♣]carpenter, tela (local bear) seller

b) Knowledge of adolescents about contraceptive methods & sexually transmitted infections

Among the adolescent students, 409 (78.5%) were aware of at least one contraceptives methods. Three hundred four (64.1%) & 301 (57.8%) participants reported that they had heard about condom and pill respectively (fig1).

Adolescent students were asked to spontaneously mention STI. Accordingly, 415(79.7%) respondents mentioned at least one type of STI. Among the respondents, 399(76.6%), 302 (58%), 293(56.2%), 270(51.8%) and 114(21.9%) knew about HIV/AIDS, Gonorrhoea, syphilis, Chancroid and lymphgranulomavenerum respectively.

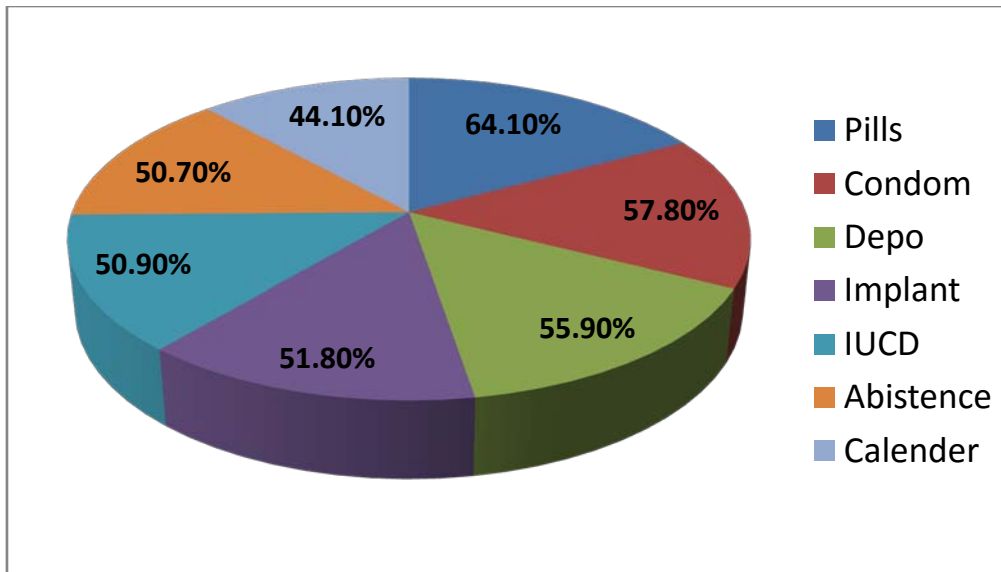


Figure 1 : Knowledge of adolescent students about contraceptive methods in Mekelle town, Tigray region, Ethiopia, 2013.

c) *Sexual Behavior of adolescent students*

One hundred nineteen (22.8%) of the students believed that it is normal and acceptable to have sexual feeling during adolescent period. Majority of the respondents 341(65.5%) believed that sexual intercourse should not be made before marriage. Regarding their practice, Eighty three (15.9%) of the students had made sexual intercourse. The mean age when sexual practice started was 15.9 ± 1.6 . Among those who practiced sexual intercourse, 22(26.5%) reported, they made sexual intercourse with unknown person. Most 60 (72.28%) of the students made sex using condom.

in place. Ninety (38.1%) of females reported that they were not allowed to have relationship with opposite sex, while the rest 146(61.86 %) were allowed. Three hundred forty eight (66.8%) of the students reported that their parents knew with whom their son or daughter are when out of home, while 173(33.2%) of the respondents reported that parents did not know.

d) *Attitude and practice of adolescent students towards parental monitoring*

Most 344(66%) of the respondents agreed that parental monitoring to adolescents activities should be

e) *Parent-adolescent Communication & source of information about sexual & reproductive health issues*

Two hundred ninety six (56.8%) of respondents got information on sexual &RH issues from school followed by media 239 (45.9%) (fig2).

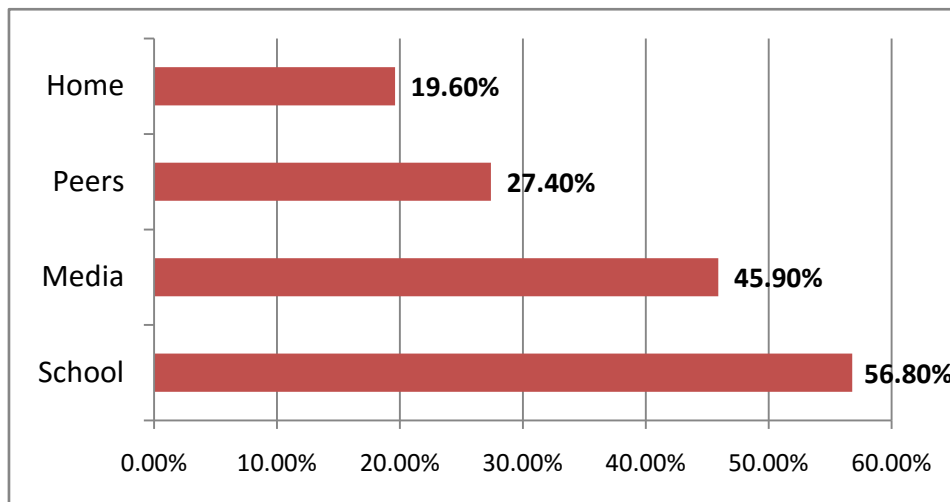


Figure 2 : Adolescents source of information about SRH, Mekelle town, Tigray region, Ethiopia, 2013.

Three hundred (57.6%) participants reported that they had discussed about at least one topic of sexual and /or reproductive health with either of their parents. Cultural unacceptability, being ashamed and lack of knowledge were major reasons cited by participants for not discussing about family planning (Table3)

Table 1 : Adolescent students' reason for not discussing with their parents about SRH in Mekelle town, Tigray region, Ethiopia, 2013

Topic	Not discussed*	Reasons for not discussing about SRH						
		Culturally unacceptable*	Shame*	Parents lack of comm. Skill*	Parents lack of knowledge*	Taboo* (Religious)	Parents are not good listener*	Do not know*
Contraceptive	337(64.7)	45(8.6)	93(17.9)	18(3.5)	56(10.7)	16(3.1)	25(4.8)	82(15.2)
HIV/AIDS	197(37.8)	17(3.3)	46(8.8)	13(2.5)	26(5)	10(1.9)	15(2.9)	56(10.7)
Sexual intercourse	335(64.3)	33(6.3)	108(20.7)	18(3.5)	36(6.9)	17(3.3)	21(4)	76(14.6)
Unwanted pregnancy	292(56)	22(4.2)	73(14)	20(3.8)	32(6.1)	19(3.6)	22(4.2)	84(16.1)
Premarital sex	288(55.3)	22(4.2)	80(15.4)	15(2.9)	25(4.8)	23(4.4)	24(4.6)	79(15.2)
Condom	366(70.2)	38(7.3)	107(20.5)	22(4.2)	39(7.5)	5(1)	20(2.8)	114(21.9)
Puberty	250(48)	12(2.3)	74(14.2)	15(2.9)	30(5.8)	19(3.6)	22(4.2)	60(11.5)

*Percents are in brackets

f) Factors associated with adolescent-parent communication about sexual and reproductive health matters

In multivariate logistic regression analysis, parents' educational status, living arrangement and level of education of respondents were found to be significantly associated with communication of adolescents with their parents about sexual and reproductive health matters (table 4).

Table 4 : Multivariate analysis of factors related to communication of adolescents about SRH with their parents in Mekelle town, Tigray region, Ethiopia, 2013

Variable	Discussed on SRH		Adjusted OR	P-value
	Yes	No		
Sex				
Male	129(55.8%)	102(44.2%)	1	
Female	171(59%)	119(41%)	0.90(0.62-1.30)	0.58
Age category				
10-14	13(59.1%)	9(40.9%)	1.36(0.51-3.38)	0.57
15-19	287(57.5%)	212(42.5%)	1	
Living arrangement				
With both parents	227(58.5%)	161(41.5%)	2.01(1.09-3.68)	0.02 ♣
With mother only	43(48.9%)	45(51.1%)	0.48(0.11-2.16)	0.34
With father only	10(76.9%)	3(23.1%)	1.27(0.54-2.96)	0.58
With others [▼]	20(62.5%)	12(37.5%)	1	
Grade				
9 th	70(48.6%)	74(51.4%)	1	
10 th	85(54.1)	72(45.9%)	0.75(0.46-1.23)	0.27
11 th	80(68.4%)	37(31.6)	0.42(0.24-0.74)	0.003 ♣
12 th	65(63.1%)	38(36.9%)	0.55(0.31-0.97)	0.04 ♣
Mothers' education				
No formal education	120(52.2%)	110(47.8%)	1	
Elementary	27(58.7%)	19(41.3%)	0.51(0.25-1.06)	0.07
12+	153(62.4%)	92(37.6%)	3(1.271-2.75)	0.002 ♣
Fathers' education				
No formal education	112(57.4%)	83(42.6%)	1	
Elementary	24(57.1%)	18(42.9%)	1.86(0.60-4.19)	0.14
12+	164(57.7%)	120(42.3%)	1.80(1.03-3.13)	0.04 ♣
Mothers' occupation				
Employed.	93(59.2%)	64(40.8%)	1.58(0.60-4.19)	0.36
House wife	113(54.3%)	95(45.7%)	1.46(0.60-3.62)	0.39
Merchant	68(57.6%)	50(42.4%)	1.41(0.55-3.64)	0.48
Others	26(68.4%)	12(31.6%)	1	
Fathers' occupation				
Employed	147(58.1%)	106(41.9%)	1.19(0.58-2.45)	0.63
Merchant	105(56.1%)	82(43.9%)	1.48(0.60-3.62)	0.39
Others [†]	48(59.3%)	33(40.7%)	1.41(0.545-3.64)	0.48
Family size				
<5	84(58.3%)	60(41.7%)	0.92(0.59-1.43)	0.71
>=5	216(57.3%)	161(42.7%)	1	
Know at least one contraceptive method				
Yes	241(58.9%)	168(41.1%)	0.71(0.45-1.11)	0.14
No	59(52.7%)	53(47.3%)	1	
Believe sex education is necessary				
Yes	256(60.7%)	166(39.3%)	0.55(0.345-1.88)	0.61
No	44(44.4%)	55(55.6%)	1	

*p value < 0.05 ; [▼]Aunt, grandparents, uncle, sister, brother; [†]carpenter, farmer

Level of education showed strong statistical association with communication about sexual and reproductive health. Adolescents whose mothers educational level was 12 and above were about 3 times (AOR=3, 95% CL: [1.271-2.75]) more likely to communicate about sexual and reproductive health

matters with their parents as compared to those who had not attended formal education. Similarly, father's educational status has revealed a significant association with the communication about sexual and reproductive health issues. Adolescents whose father's educational level were 12 and above were about 2 times

(AOR=1.80, 95% CL: [1.03-3.13]) more likely to communicate about sexual and reproductive health matters with their parents as compared to those who had no formal education.

On the contrary, adolescents' level of education was found to be negatively related with the outcome variable. Adolescents whose level of education was 12 were less likely to communicate about sexual and reproductive health with their parents as compared to those whose educational level was grade nine (AOR: 0.55, 95%CI: [0.31-0.97]).

IV. DISCUSSION

Parents are important role models in adolescents' lives; they can directly or indirectly transmit values, traditions and life styles to their children. Positive family communication helps teens develop the values, security, and sense of worth that can lead to healthy decision making. This school based cross-sectional study has therefore examined adolescent communication with their parents concerning sexual and reproductive health matters among adolescent students in Mekelle secondary and preparatory school students, Tigray region, Ethiopia.

In line with the evidence from a study done in Nekemete town, and Myanmar [Seme & Wirtu, 2008; Nuoo et al, 2011], the finding of the present study indicated that the prevalence of adolescents' communication about at least one sexual and reproductive health matters with their respective parents was 57.6%. This finding was higher when compared to the result of a cross sectional study done in Benishangul gumuz regional state 28.9% [Yesus & Fantahun, 2010] and Debreworkos town 36.9% [Shiferaw et al, 2014]. This might be due to the time gap that there could be improvement in accessing and utilizing sexuality and reproductive health service. However, it is by far lower than study findings from United States and Mexico [Jerman & Constantine, 2010; Erika, 2009] where 85% and 81.5 % adolescents communicated with their parents about SRH matters respectively. This difference could be attributed to the fact that proportion of parents in the United States was more educated, reproductive health services were accessible in-terms of minimal distance and transport availability, and adolescents could have better decision making autonomy.

In multivariate analysis, level of education showed strong statistical association with communication about sexual and reproductive health. Adolescents whose mothers' educational level 12 and above were about 3 times more likely to communicate about sexual and reproductive health matters with their parents as compared to those whose parents had not attended formal education. Similarly, adolescents whose father's educational level 12 and above were about 2 times more likely to communicate about sexual and

reproductive health matters with their parents when compared to those whose parents had no formal education. This is congruent with previous finding from study done in Rwanda [Bushaija et al,2013].The possible explanations might be educated parents have better access to health service information, improved perceptions of the causes and treatment of sexual and reproductive system related disease and play critical role in helping their children use quality reproductive healthcare services.

In contrary to evidence from a study done in Nekemete, Debreworkos and Lincoln [Seme & Wirtu, 2008; Shiferaw et al, 2014; Raffaelli & Green, 2003], this finding revealed that adolescents whose level of education was 12 were less likely to communicate about sexual and reproductive health with their parents as compared to those whose educational level was grade nine. This might be due to the reason that as educational level of adolescents increase they start underestimating the idea of their parents as they believe that they are more knowledgeable than their mothers or fathers and may not get inspired to communicate about sexual and reproductive health.

Among respondents who made communication regarding SRH matters, 12.9% and 31.9% adolescents discussed about premarital sex with their father and mother respectively. This is higher when compared with the findings from study in Debreworkos [Shiferaw et al, 2014], where 11.3and 15.3 of adolescents' father and mother discussed about premarital sex respectively. In line with a finding from study done in Debreworkos [Shiferaw et al, 2014], this study showed that the major reason for not discussing premarital sex was being ashamed. This can be attributed to the taboo nature of sexual and reproductive communication in traditional African settings including Ethiopia.

When interpreting the finding of this study, some limitations should be considered.

Communication on sexual and reproductive health as well as sexual behaviors was based on the self-report of respondents, and provided no validation of obtained information with any objective source, which was likely to be subjected to reporting biases. Moreover, this study was based on cross-sectional data, which implies that the direction of causal relationships cannot be determined.

V. CONCLUSION AND RECOMMENDATIONS

In this study almost half of school adolescent has never had communication with their parents regarding sexual and reproductive health matters. Educational status of their mother and father, living arrangement and level of education of respondents were found to be significantly associated with communication of adolescents with their parents about sexual and reproductive health matters. Among the respondents

who made communication regarding SRH matters, only very small number of them discussed about early sexual practice and sexual transmitted infections with their parents. The major reason respondents expressed for not discussing early sexual practice, contraception, sexual transmitted infections and unwanted pregnancy was being ashamed.

Based on the findings of the study, the following recommendations were made.

This study showed that a significant proportion of adolescents did not discuss with their parents about at least one sexual and reproductive health matters. Therefore, the MOH, and other concerned stakeholders that are working in areas of reproductive health should strengthen existing strategies including provision of information, education and communication targeting adolescents and their parents to increase their awareness mainly about the impact of early sexual practice and its outcomes such as unwanted pregnancy and sexually transmitted infections (STIs).

As educational level of parents is a critical factor in advancing parent-adolescent communication about SRH matters, policy makers and program managers should focus on encouraging parents to pursue formal education. Moreover, health care providers should be effective in equipping adolescents with adequate sexual and reproductive health information, being respectful and keeping their privacy during their visit to health facility. Finally, further research with robust analytical studies on timing of parents-adolescents communication regarding sexuality and reproductive health related issues and its effect on safe sexual behaviors.

Abbreviations

EDHS: Ethiopian Demographic and Health Survey;
SRH: Adolescent Sexual and Reproductive Health;
MDG: Millennium Development Goals;
AIDS: Acquired immune deficiency syndrome;
RH: Reproductive Health;
STI: Sexual transmitted infection;
WHO: World Health Organization.

Competing interests

The authors declare that they have no competing interests.

VI. ACKNOWLEDGEMENTS

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