

# Factors Associated with Magnitude of Exchange of Sexually Explicit Contents among High School Students: A Cross Sectional Study

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## Abstract

**Background:** “Exchange of sexually explicit content” refers to behaviors such as sending or receiving nude or partially nude images, and sexually suggestive texts and calls via cell phones or other electronic media. As mobile technology is increasingly used to form and maintain social relationships, sexual content-sharing practices are becoming common among young people, contributing to technology-driven sexual risks. Despite this prevalence, there is a paucity of evidence on the prevalence of sexually explicit content-sharing among high school students.

**Objective:** This study aims to assess the magnitude of exchange of sexually explicit materials and associated risk factors among high school students.

**Method:** A cross-sectional study design using a stratified sampling technique was employed applied to 590 students from April 18, 2022 to May 03, 2022. Data was collected through structured, self-administered questionnaire. Data were coded and entered into Epi-Data version 3.1 and exported to SPSS version 25 for analysis. The degree of association between dependent and independent variables was assessed using bivariable and multivariable logistic regression analysis. Variables with p-value of less than 0.05 were considered significant.

**Result:** Overall about 220(38.4%) (95% CI 34.4-42.5) of high school students were actively engaged in exchange of sexually explicit contents. Associated factors were being male (AOR=2.08, 95%CI 1.37, 3.16), being in grade 12 (AOR=3.29, 95%CI 1.84, 5.89), living with mother (AOR=7.49, 95%CI 4.01, 14.01), living with father (AOR= 7.06, 95% CI 2.99, 16.66), having a social media account (AOR=3.35, 95%CI 1.87, 6.07), free internet access (AOR=2.29, 95%CI 1.49, 3.49) and having a low religiosity scale (AOR=1.67, 95% CI 1.10, 2.54).

**Conclusion:** This study indicated that being male, having a low religiosity scale, living with a single parent, and visiting variety of social media were the major predictors associated with exchange of sexually explicit contents in Debre Markos high school students. There is a vital need to inform students of the consequences of this behavior on sexual health. Guardians or parents should strengthen their child's religious faith and parent their children together instead of individually. The purpose of information communication technology (ICT) materials in schools should be clearly explained to the students as being for the sole purpose of information gathering and not for illicit purpose.

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## Introduction

Exchange of sexually explicit content is the act of sending or receiving self-generated sexually suggestive materials such as photos, videos, messages, and audio via Mobile phones or other electronic media(1). It integrates the production, possession and distribution of self-exploiting sexual material in audio, visual and written form(2) and is a phenomenon that derives directly from the digital age and opportunities to share text messages, pictures, and videos fast and conveniently(3).

Exchange of sexually explicit material became an unforeseen use of technology when mobile phone developers created camera phones. Advanced technology in cell phones has contributed to an environment in which the practice of this behavior is now widespread(4). The initiation and rise in popularity of smart mobile phones, tablets, and communication technology devices, combined with the recent boom in internet access and use, has contributed to negative effects on the healthy growth and development of young people(2).

The instant access of social media such as Face book, Telegram, Imo, Instagram, instant messaging and the ubiquitous cell phone with its text messaging and still/video camera have dramatically changed when, how, and what adolescents learn about each other and the world. These devices and apps have also enabled or at least significantly promoted access to both commercial and amateur sexually explicit media and other sex-related sites by young people(5). High School students often initiate and develop many types of relationships through text messages, such as dating and sexual relationships(6).

Exchange of sexually explicit content is considered a globalized social phenomenon, and student exchange has received much media attention in recent years(7). It is considered a deviant behavior that is closely linked to mental health, and may be a marker of adolescent involvement in risky sexual behavior, cyber bullying and substance abuse(8). Five years of global academic collaboration on sexual and reproductive health and rights policies showed that in Belgium, 4.3% of boys and 0.5% of girls reported ever sending a sexual picture of themselves to someone (sexting)(1). The National Campaign to Prevent Teen and Unplanned Pregnancy (2008) survey reported that 33% of young adults had sent nude or semi-nude images of themselves, while 64% had received sexually suggestive messages(9). As demonstrated by a recent meta-

analysis, the prevalence of exchange of sexually explicit contents was 14.8%(10).

Increasing access to digital technology to young people in low-income countries also has influenced their pornography viewing and receiving or sending of sexual explicit materials via electronic devices and change the sexual communication and behavior of the young populations(11).

In Ethiopia, findings show young people use smart phones and social media increasingly in their daily life. There is a consensus that social media and some networking sites may have both benefits and risks for students' sexual health and academic affairs(12).

## Method

**Study area:** This study was conducted at Debre Markos town high schools. Debre Markos town is located 300km from Addis Ababa, the capital city of Ethiopia, and 265 km from Bihar Dar, the capital city of Amhara regional state. In Debre Markos town there are four public high schools managed through the city administration: Debre Markos higher secondary school (1282 students), Menkoror higher secondary school (1815 students), Nigus Teklehaymanot higher secondary school (2204 students) and Ethio Japan (Jaika) higher secondary school (1917 students).

**Selection Criteria:** The selected participants were all high school students from Debre Markos town during the study period. The sample size was determined using single population proportion and double proportion for the secondary objectives, using a 95% confidence interval with 4% marginal error, and by adding a 10% non-response rate, taking the identified single proportion as 33.7% from the previous study conducted in the Northern part of Ethiopia(11).

A stratified sampling technique was used. The strata were classified as grade 9, grade 10, grade 11 and grade 12, with sampling units selected with proportional allocation to each stratum (grade). The sampling frame was the mark list or roster of the students obtained from each school. The sample size was selected using a computer-generated method in each grade, based on the number of students in each grade and the sample size for each of the four schools.

Sample size calculation for the second objective was calculated by double population proportion of significant variables

using Epi Info version 7.2.2.6 statistical software as follows below. Finally, the maximum sample size was taken.

**Table 1:** Sample size for second objectives by using double proportion formulas from the previous study:

Factors	CI	P(1-β)	Ratio	Proportion of exchange sexually explicit contents among exposed	Proportion of exchange sexually explicit contents among non exposed	Sample size		References
						N	N+non response (10%)	
Sex	95%	80%	1	83.6	70.3	342	342+35=377	(13)
Alcohol	95%	80%	1	89.9	63.2	90	90+9=99	(13)

*The sample size for double proportion is 377, so the final sample size for the study was 590.*

**Data collection procedures and quality assurance:** Data was collected using a self-administered structured questionnaire focusing on the exchange of sexually explicit content among high school students, and factors contributing to the frequency and prevalence of this exchange. This questionnaire was adopted from the literature and modified for this study (3, 13-19). The data collection tool addressed socio-demographic characteristics, behavioral factors, religiosity, and technology-related factors as they contribute to the magnitude of exchange. The questionnaire was first prepared in English, then translated to Amharic, and back again to English by another translator to check the accuracy and consistency of the translation in Amharic. After the final translation of the tool was reviewed, the Amharic version was used to collect data. A pre-test was conducted on 30 high school students at Gozzamin high school (5% of the total sample size) and the results used for a final revision of the questionnaire. For the data collection process, three BSC nurses were employed for the data collection and one health officer was assigned a supervising role. Training was given for a day on the objectives and relevance of the study. A reliability test of the religiosity scales was done using Cronbach's Alpha with a value of 0.83. The data collected was evaluated for completeness and problems with data collection were addressed daily. Lastly, all the collected data was checked by investigators for its completeness and consistency during data management, data storage, and analysis.

**Data processing and analysis:** Data was entered into epi-data 3.1 versions and then exported to SPSS version 25 for analysis. Descriptive statistics including percentages, ratios, frequency distribution, and measures of central tendency were used to describe different variables based on the nature of the variables. Results were presented in tables and graphs. Model

fitness and multicollinearity assumptions were checked before analysis. The association between dependent and independent variables was assessed using bivariate and multivariate analysis. Variables with a p-value less than 0.25 in the binary logistic regression were considered for multivariable logistic regression analyses. Finally, p-value <0.05 and adjusted odds ratio together with their corresponding 95% confidence intervals were considered to conclude a result as statistically significant.

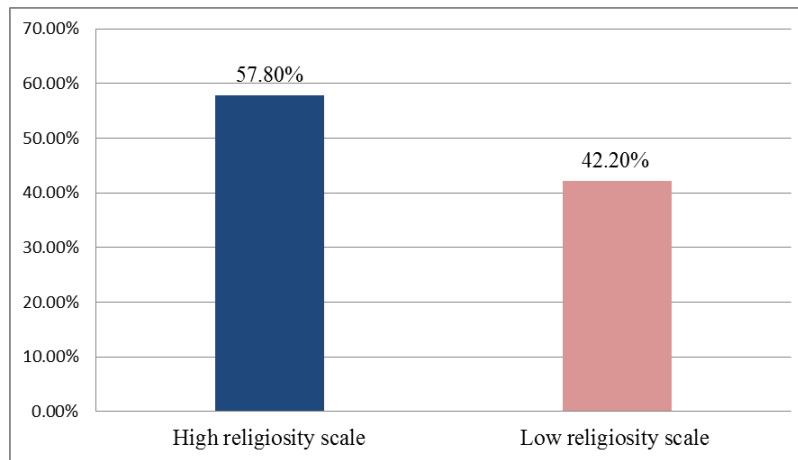
## Result

**Socio-demographic characteristics of participants:** A total of 573 students participated out of 590 in the study with a response rate of 97.1%. The mean age of respondents was 18.27 (SD ± 1.674) years and the majority of respondents 361(63%) were in the age range of 18-20. About 318(55.5%) of respondents were male and the majority of respondents (432 (75.4%)) were living with both parents. Most (546 (95.3%)) respondents were orthodox Christian and nearly 486 (85%) of respondents were from urban areas (Table 2).

**Table 2:** Socio-demographic characteristics of Debre Markos high school students, 2022(N=573)

Variables		Frequency	Percentage (%)
Sex	Male	318	55.5
	Female	255	44.5
Age	15-17	174	30.4
	18-20	361	63
	21-24	38	6.6
Grade	9	208	36.3
	10	146	25.5
	11	113	19.7
	12	106	18.5
Religion	Orthodox	546	95.3
	Muslim	11	1.9
	Protestant	10	1.8
	Catholic	6	1.04
Residence	Urban	486	84.8
	Rural	87	15.2
Family structure	Both parents	432	75.4
	With mother	78	13.6
	With father	40	7.0
	Alone	9	1.6
	With friend	7	1.2
	With other relatives	7	1.2
Educational level/father	Can't read and write	91	15.9
	Primary	88	15.4
	Secondary	129	22.5
	Degree	231	40.3
	MSC and above	34	5.9
Educational level/mother	Can't read and write	147	25.7
	Primary	130	22.7
	Secondary	104	18.2
	Degree	175	30.5
	Above	17	3.0
Father occupation	Employee	291	50.8
	Farmer	132	23.0
	Daily laborer	41	7.1
	Merchant	109	19.0
Mother occupation	Employee	172	30.0
	House wife	249	43.5
	Daily laborer	65	11.3
	Merchant	87	15.2

In addition to religious identity, high school students' religiosity was assessed in this study. More than half 331(57.8%) had high faith on the religiosity scale (**Figure 1**).



**Figure 1:** Religiosity scale among high school students at Debre Markos town in 2022(N=573)

**High school students and technology:** About 560(97.7%) of school youths had access to information technology. Among these, the majority (509 (88.8%))used mobile phones.

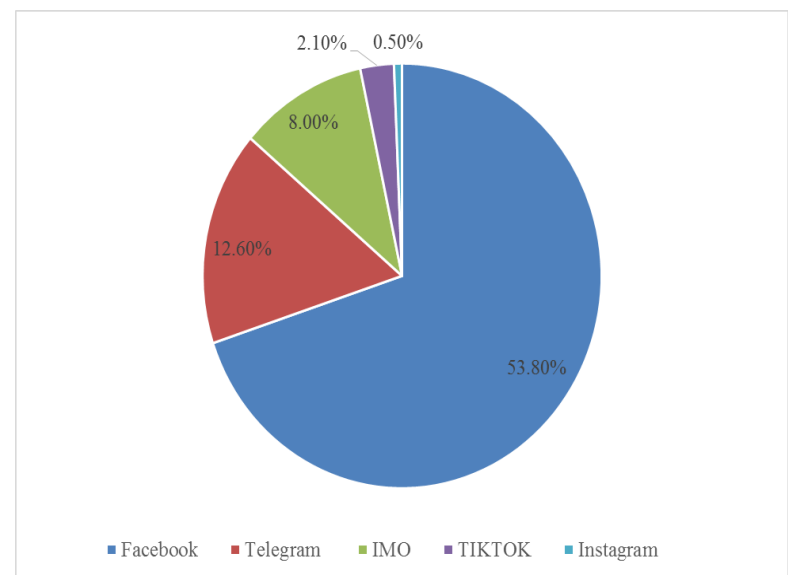
In this study about 252(43.9%) students were able to watch television programs and 206 (36%) of respondents had free internet access at their house or schools (**Table 3**).

**Table 3:** Utilization of technologies among Debre Markos high school students 2022

Variables		Frequency	Percent (%)
<b>Mostly use of Information Communication Technology materials</b>			
Mobile		509	88.8
Laptop		32	5.6
Tablet		11	3.7
Desktop		8	1.9
<b>Type of TV programs mostly watched</b>			
Music videos		52	9.1
Foreign movies		82	14.3
Amharic movies		64	11.2
Romantic movies		46	8.0
Documentary		8	1.3
<b>Free internet access</b>	Yes	206	36.0
	No	367	64.0

This study indicated that about 441(77%) of youths used social media; among these, the majority of them (about 308 (53.80%)) had a Facebook account (**Figure 2**).

**Sexuality and other behavioral characteristics reported:** About 112(19.5%) of respondents had a boy/girlfriend, and 41(7.2%) of respondents had previously had sexual intercourse. About 52(9.1%) of respondents consumed various types of alcohol including local beverages (**Table 4**).



**Figure 2:** Percent of social media account usage of high school students at Debre Markos town, 2022

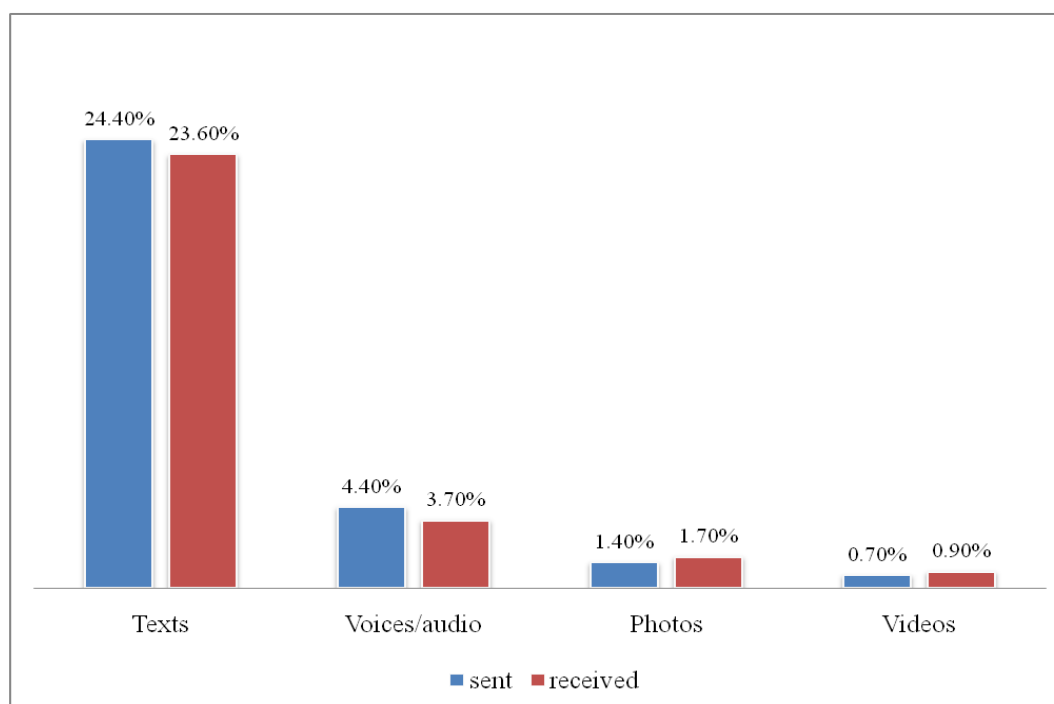
**Table 4:** Sexuality and other related characteristics reported among high school students in Debre Markos town, 2022(N=573)

Variables	Categories	Frequency	Percent (%)
Had boy/girlfriend	Yes	112	19.5
	No	461	80.5
Ever had sex	Yes	41	7.2
	No	532	92.8
Multiple sexual partners	Yes	38	6.6
	No	535	93.4
Pornography watching	Yes	99	17.3
	No	474	82.7
Alcohol consumption	Yes	52	9.1
	No	521	90.9

**Prevalence of exchange of sexually explicit materials:**

From the total of 573 high School students surveyed, about 220 (38.4%) (95% CI 34.4 - 42.5) reported having exchanged sexually explicit materials in the past year. In this study, 177 (30.9%) of respondents were senders, 171 (29.8%) of re-

spondents were receivers, and about 128 (22.34%) of students both sent and received different types of sexually explicit contents. Regarding the type of sexually explicit materials, text messaging was the most common while videos were the least common (**Figure 3**).

**Figure 3:** Types of exchanged sexually explicit materials among high school students in Debre Markos town 2022**Factors significantly associated with exchange of sexually explicit materials:**

Bivariate and multivariate analysis was conducted to determine factors associated with exchange of sexually explicit contents. Variables such as sex, grade level, living arrangements, mother's occupation, internet access, having a social media account, having a romantic relationship, having multiple sexual partners and religiosity were variables with p-value less than 0.25 in bivariable analysis. Then these variables were analyzed by a multivariable logistic regression model. Variables having p-value less than

0.05 in the multivariable model were considered significantly associated. Among these, students' sex, grade level, living arrangement (with one or two parents or a guardian), internet accessibility, having a social media account, and religiosity were factors associated with exchange of sexually explicit materials.

Model fitness was checked with Hosmer and Lemeshow goodness of fit test and fit with value = 0.141. There is no problem of multicollinearity among independent variables with variance inflation factors less than 2.

In this study, males were about 2 times more likely to practice exchange of sexually explicit materials than females (AOR = 2.08, 95%CI 1.37, 3.16). Grade level of students was a socio-demographic predictor: students who were in grade 12 were 3.29 times (AOR=3.29, 95%CI 1.84, 5.89) more likely to exchange sexually explicit content than those who were in grade 9. High school students who were living with a single mother were 7.49 times (AOR= 7.49, 95%CI 4.01, 14.01) more likely to engage in exchange of sexually explicit content than students who were living with both parents. Students who were living only with their father were 7 times (AOR=7.06, 95%CI 2.99, 16.67) more likely to exercise exchange of sexually explicit content than those living with both parents.

The odds of exchanging sexually explicit content among students who had free internet access were 2.29 times (AOR=2.29, 95%CI 1.49, 3.49) more likely than among those who had no free internet services. The likelihood of exchanging sexually explicit material among high school students were 3.35 times higher among those who had social media accounts when compared to students who had no social media accounts (AOR=3.35, 95%CI 1.87, 6.07).

Regarding religiosity; high school students who reported a low religiosity scale were 1.67 times (AOR=1.67, 95%CI 1.10, 2.54) more likely to engage in exchange of sexually explicit content those who claimed a high religiosity scale (Table 5).

**Table 5:** Factors associated with exchange sexually explicit contents among Debre Markos high school students, 2022(N=573)

Variables	Category	Exchange of sexually explicit contents		COR(95%CI)	AOR(95%CI)	P-value
		Yes	No			
Sex	Male	150	168	2.36(1.66,3.36)	2.08(1.37,3.16)	0.001*
	Female	70	185	1	1	
Grade	9	59	149	1.0		0.519
	10	41	105	0.99(0.62,1.58)	0.84(0.49,1.44)	
	11	42	66	1.79(1.11,2.91)	1.07(0.61,1.89)	
	12	73	33	5.59(3.36,9.30)	3.29(1.84,5.89)	
Family structure	Both parents	120	312	1	1	<0.001*
	Mother	60	18	8.67(4.92,15.28)	7.49(4.01,14.01)	
	Father	31	9	8.96(4.14,19.37)	7.06(2.99,16.66)	
	Other guardians	9	14	1.67(0.71,3.96)	0.89(0.33,2.42)	
Mother's occupation	Employed	68	104	1		0.419
	Housewife	79	170	0.91(0.47,1.07)	0.82(0.49,1.34)	
	Day laborer	33	32	1.58(0.89,2.80)	1.19(0.56,2.55)	
	Merchant	40	47	1.31(0.78,2.19)	1.17(0.62,2.23)	
Free Internet access	Yes	103	103	2.34(1.51,3.03)	2.29(1.49,3.49)	<0.001*
	No	117	250	1	1	
Access to Social media	Yes	201	237	5.18(3.08,8.71)	3.35(1.87,6.07)	<0.001*
	No	19	116	1	1	
Sexual intercourse	Yes	21	20	1.76(0.93,3.32)	1.69(0.79,3.62)	0.174
	No	119	333	1	1	
Have multiple sexual partners	Yes	25	13	3.35(1.68,6.71)	1.32(0.59,2.98)	0.498
	No	195	340	1	1	
Religiosity	Low faith	123	119	2.49(1.77,3.52)	1.67(1.10,2.54)	0.016*
	High faith	97	234	1	1	

**NB:** Variables having a ( $p < 0.25$ ) in bivariable (crude) analysis included in the multivariable logistic regression (adjusted) analysis.

\* Statistically significant at  $P\text{-value} < 0.05$  and 1= reference.



## Discussion

**Summary of main findings:** This study investigated the magnitude of exchange of sexually explicit material and associated factors among high school students.

In this study, the prevalence of exchange of sexually explicit contents among high school students in Debre Markos town was found to be 38.4% (95% CI 34.4 -42.5).

**Comparison with other Reviews:** The finding of this study was in line with a study conducted in Arizona, USA (38%) (20). But our results show higher rate of exchange than a previous study conducted in Tigray (33.7%) likely due to study population differences and rural high schools were included Tigray (11). Our data also show a higher rate of exchange than a meta-analysis and systematic review study on exchange of sexually explicit contents among youth (14.8%) (10) as well as other studies conducted in Rhode Island, USA, (22%) (21) and Zimbabwe (13%) (22). These variations were likely due to differences in study populations (starting with middle school age in the study conducted USA) and possibly variation in the amount of time to exposed digital technologies. However, our findings are lower than studies conducted in Kenya (57%) (23), Spain (58%) (24), and the Netherlands (71%) (25). This could be due to differences in availability and accessibility of free internet, early adoption of technology, and differences in cultural and social norms.

In our study, male gender was more frequently associated with exchange of sexually explicit contents than female gender. This result is similar to studies from Zimbabwe (22), Botswana (26) and Spain (24) on exchange of sexually explicit material. This might be due to socio cultural influences and/or gender differences in exposure to electronic materials. In our country, Ethiopia, it is a taboo for a female to clearly engage in such behaviors, and even if they engage they are less likely to report it as they know it is taboo (27).

According to the study conducted in USA, students in grade 12 were more likely to have engaged in exchange of sexually explicit content (28), consistent with the finding of this study. The possible explanation for this could be the effect of developmental age or grade level. This correspondence suggests that internet searching habits and use of a variety of technologies may increase with age/grade level.

High school students who live with single parent were more likely to exchange explicit contents than students living with both parents. This finding agrees with a similar study conducted in Spain (24). This may be because students who live with a single parent have less parental guidance and support, the family environment may be poor, and there may be little discussion of issues such as sexual intimacy, dangerous activities, and self-management of sexual relationships.

Our study also suggests that high school students with social media accounts are more likely to be exposed to sexually explicit materials than students who lack social media accounts. This is consistent with findings in a study conducted in Ecuador (29).

Internet access was one of the significant factors contributing to exchange of sexually explicit material in this study. Students who had free internet (wifi) access were more likely to exchange sexually explicit content than those who had not wifi access. This result is supported by a study conducted in Netherlands (25); however, wifi access was not found significant in a previous study in Belgium (30). A possible explanation for this difference may be due to differences in internet availability and accessibility: most developed and some Western countries have access to free internet easily and relatively cheaply, so they may be unaffected by the availability of the internet. However countries like Ethiopia take advantage of free internet to practice such kinds of behaviors (31).

Lastly, this study investigated the role of religiosity or religious faith; high school students who had a low religiosity scale were more likely to exchange sexually explicit content than those who had high religiosity scale. This finding was also agreed by the study conducted in New York (32). The reason is likely because religiosity lowers sexually permissive attitudes toward non-marital sex. In Ethiopia, teachings of the religious belief systems and customs are one mechanism of social control because they socialize members to adopt organizational norms and values (33).

### Limitations:

- Since this study examines personal and sensitive issues, it may have been difficult to get an honest answer about sexually-related data from high school students.
- This data might have prone to response bias.
- The direction of causal relationships cannot be determined since this study was based on cross-sectional data.



## Conclusion

Exchange of sexually explicit contents among high school students in Debre Markos town was found to be high. Sex, grade level of students, family structure, and use of social media, internet access, and religiosity were found to have significant or effect on the magnitude of exchange of sexually explicit contents among high school students. The most common mode for exchanging explicit content was text messages, while video was the least common. Most participants had access to information communication technologies.

## Recommendation

- Guardians or parents should strengthen their child's religious faith with good follow up. This may be more effective when children are living with two parents rather than one.
- The purpose of ICT materials in schools should be adequately explained as being for purposes of information gathering and not for illicit activities. Free internets (wifi) should be restricted or limited with in school compounds beyond academic purposes.
- Strategies should be designed to control the use of technologies and to restrict creating social media accounts at early ages. Viewing illicit content from the social sites should be limited by laws for some smart phone applications and high risk programs.
- The risks of exchanging sexually explicit content should be incorporated into school curriculum during ICT lessons, including risks involved with inappropriate internet use.
- While this study was a cross-sectional design, future research should consider a qualitative study since the issue focuses on sensitive and privacy matter.

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**Contributors:** BMZ, NA and WA conceived and designed the study. NA and WA served as advisors and critically reviewed the study proposal. : BMZ and MBA performed the literature search. : BMZ, NA, WA and MBA analyzed and interpreted the data. BMZ and MBA did statistical analyses. BMZ, MBA and YST drafted the review and did the language editing. All authors revised the article for important content and approved the final version for the article. BMZ is responsible for the overall content as guarantor.

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**Data availability statement:** Data are available on reasonable request.

## Reference

1. Chatzinikolaou A, Lievens E. Sexting amongst children and teenagers: towards a policy that balances protection and autonomy. *ANSER: five years of global academic collaboration building evidence for sexual and reproductive health and rights policies.* 2021:82-5.
2. AYOOLA DE. PRACTICE OF SEXTING AND ITS ASSOCIATED SEXUAL RISKS AMONG IN-

- SCHOOL ADOLESCENTS IN OLUYOLE LOCAL GOVERNMENT AREA, OYO STATE 2021.
3. Baiden F, Amankwah J, Owusu A. Sexting among high school students in a metropolis in Ghana: an exploratory and descriptive study. *Journal of Children and Media*. 2020;14(3):361-75.
  4. Dunphy JM, Prendergast GJ, Scolaí PÓ. The emergence of camera phones-Exploratory study on ethical and legal issues. *Communications of the IIMA*. 2003;3(1):10.
  5. Strassberg DS, McKinnon RK, Sustaíta MA, Rullo J. Sexting by high school students: An exploratory and descriptive study. *Archives of sexual behavior*. 2013;42(1):15-21.
  6. Johns MM, Lowry R, Andrzejewski J, Barrios LC, Demissie Z, McManus T, et al. Transgender identity and experiences of violence victimization, substance use, suicide risk, and sexual risk behaviors among high school students—19 states and large urban school districts, 2017. *Morbidity and Mortality Weekly Report*. 2019;68(3):67.
  7. Ahern NR, Mechling B. Sexting: Serious problems for youth. *Journal of psychosocial nursing and mental health services*. 2013;51(7):22-30.
  8. Van Ouytsel J, Lu Y, Ponnet K, Walrave M, Temple JR. Longitudinal associations between sexting, cyberbullying, and bullying among adolescents: Cross-lagged panel analysis. *Journal of adolescence*. 2019;73:36-41.
  9. Teen NCtP, Pregnancy U. Sex and tech: Results from a survey of teens and young adults. Author Washington, DC; 2008.
  10. Madigan S, Ly A, Rash CL, Van Ouytsel J, Temple JR. Prevalence of multiple forms of sexting behavior among youth: A systematic review and meta-analysis. *JAMA pediatrics*. 2018;172(4):327-35.
  11. Abrha K, Worku A, Lerebo W, Berhane Y. Sexting and high sexual risk-taking behaviours among school youth in northern Ethiopia: estimating using prevalence ratio. *BMJ Sexual & Reproductive Health*. 2019;45(3):200-6.
  12. Mulisa F, Getahun DA. Perceived benefits and risks of social media: Ethiopian secondary school students' perspectives. *Journal of technology in behavioral science*. 2018;3(4):294-300.
  13. Habesha T, Aderaw Z, Lakew S. Assessment of exposure to sexually explicit materials and factors associated with exposure among preparatory school youths in Hawassa City, Southern Ethiopia: a cross-sectional institution based survey. *Reproductive health*. 2015;12(1):1-12.
  14. Abraham AE. Sexting uncensored: an exploratory study on the behaviors, experiences, and perceptions of sexting among college students: California State University, Fresno; 2015.
  15. Mukonyo ME, Kabue P, Mugo J. SEXTING AND RISKY SEXUAL BEHAVIOUR AMONG STUDENTS IN MACHAKOS UNIVERSITY, MACHAKOS COUNTY. KENYA. *Global Journal of Health Sciences*. 2020;5(2):59-82.
  16. Olatunde O, Balogun F. Sexting: Prevalence, predictors, and associated sexual risk behaviors among postsecondary school young people in Ibadan, Nigeria. *Frontiers in public health*. 2017;5:96.
  17. Ahiataku DE. Sexting and Risky Sexual Behaviour among University of Ghana Students: University of Ghana; 2016.
  18. Freiheit SR, Sonstegard K, Schmitt A, Vye C. Religiosity and spirituality: A psychometric evaluation of the Santa Clara Strength of Religious Faith Questionnaire. *Pastoral Psychology*. 2006;55(1):27-33.
  19. Benotsch EG, Snipes DJ, Martin AM, Bull SS. Sexting, substance use, and sexual risk behavior in young adults. *Journal of adolescent health*. 2013;52(3):307-13.
  20. Perkins AB, Becker JV, Tehee M, Mackelprang E. Sexting behaviors among college students: Cause for concern? *International Journal of Sexual Health*. 2014;26(2):79-92.
  21. West JH, Lister CE, Hall PC, Crookston BT, Snow PR, Zvietcovich ME, et al. Sexting among Peruvian adolescents. *BMC public health*. 2014;14(1):1-7.
  22. Marume A, Maradzika J, January J. Adolescent sexting and risky sexual behaviours in Zimbabwe: a cross-sectional study. *Sexuality & Culture*. 2018;22(3):931-41.
  23. MAYOYO N. CYBER DATING ABUSE AND UNDERGRADUATE STUDENTS' ACADEMIC ENGAGEMENT IN SELECTED UNIVERSITIES IN NAIROBI CITY COUNTY, KENYA: SCHOOL OF EDUCATION, KENYATTA UNIVERSITY; 2021.
  24. Molla-Esparza C, López-González E, Losilla J-M. Sexting prevalence and socio-demographic correlates in Spanish secondary school students. *Sexuality Research and Social Policy*. 2021;18(1):97-111.

25. Peter J, Valkenburg PM. Adolescents' exposure to sexually explicit material on the Internet. *Communication Research*. 2006;33(2):178-204.
26. Makgale OL, Plattner IE. Sexting and risky sexual behaviours among undergraduate students in Botswana: an exploratory study. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*. 2017;11(2).
27. Browes NC. Comprehensive sexuality education, culture and gender: the effect of the cultural setting on a sexuality education programme in Ethiopia. *Sex Education*. 2015;15(6):655-70.
28. Dake JA, Price JH, Maziarz L, Ward B. Prevalence and correlates of sexting behavior in adolescents. *American Journal of Sexuality Education*. 2012;7(1):1-15.
29. Yépez-Tito P, Ferragut M, Blanca MJ. Sexting in adolescence: The use of technology and parental supervision. *Revista Latinoamericana de Psicología*. 2020;52:115-30.
30. Van Ouytsel J, Van Gool E, Walrave M, Ponnet K, Peeters E. Sexting: adolescents' perceptions of the applications used for, motives for, and consequences of sexting. *Journal of Youth Studies*. 2017;20(4):446-70.
31. UNCTAD M, editor *Technology and innovation report 2021*. United Nations Conference on Trade and Development; 2021: United Nations Geneva.
32. Hall M, Williams RD, Ford MA, Cromeans EM, Bergman RJ. Hooking-up, religiosity, and sexting among college students. *Journal of religion and health*. 2020;59(1):484-96.
33. Somefun OD. Religiosity and sexual abstinence among Nigerian youths: does parent religion matter? *BMC public health*. 2019;19(1):1-11.