Determinants of early sexual initiation among female youth in Ethiopia: A multilevel analysis of 2016 Ethiopian Demographic and Health Survey

Mastewal Arefaynie (marefaynie@yahoo.com)
Wollo University https://orcid.org/0000-0001-9525-0552
Melaku Yalew
Wollo University
Yitayish Damtie
Wollo University
Bereket Kefale
Wollo University

Research article

Keywords: Early sexual initiation, Female youth, Ethiopia, Multi-level analysis, EDHS 2016

DOI: https://doi.org/10.21203/rs.3.rs-36210/v3

Abstract

Background: There is limited national evidence on determinants of early sexual initiation among female youth especially; community level factors are not investigated in Ethiopia. Therefore, this study aimed to assess individual and community level factors associated with early sexual initiation among female youth in Ethiopia. Methods: A secondary data analysis was done on the 2016 Ethiopian Demographic and Health Survey (EDHS) dataset. A total of 6,143 female youth were included in the analysis. Multi-level mixed-effect logistic regression analysis was done by using STATA version 14.0 to identify individual and community-level factors. Adjusted odds ratio along with 95% confidence interval was used to show the strength and direction of association and statistical significance was declared at P value less than 0.05. Results: Individual-level factors significantly associated with early sexual initiation among female youth were; age group from 19-24 years [AOR=5.8, 95% CI= (4.6, 7.3)], not attend school [AOR=14.1, 95% CI= (8.1, 24.7)], ever chew Chat [AOR= 2.0, 95% CI= (1.3, 3.0)]. From community label factors: living in Addis Ababa [AOR= 0.3, 95% CI= (0.2, 0.5)], living in Gambella [AOR=2.7, 95% CI= (1.7, 4.3)] and live in low proportion of poor communities [AOR= 0.7, 95% CI= (0.5, 0.9)] were significantly associated with early sexual initiation among female youth in Ethiopia. Conclusions: Age, low educational status, ever chewing Chat, region and live in high proportion of poor community had statistical association with early sexual initiation among female youth in Ethiopia. Improving educational coverage and community level of wealth status are important intervention areas to delay the age of early sexual initiation among female youth.

Background

Even though, different countries and organizations have different age classification of youth, according to WHO, UNFPA and UNICEF classification, individuals from age 10-19, 15-24 and 10-24 are adolescent, youth and young respectively. It is the transitional stage from childhood to adulthood with biological, social, psychological change (1, 2). Many adult mental process start during this time. So, it is a time of risk and opportunity for future life (3-6).

There is no universal agreement on definition of early sexual initiation. Different scholars define it according to the social and demographic context of the nation (7-9). But, according to Universal Declaration of Human Rights, individuals below 18 years old are considered as child, who cannot make decision in relation to marriage and/or consensual sexual relationship (10). They are mentally, physically and socially not ready to pass through safe sexual practice and gestation. In Ethiopia the minimum age of marriage is 18 (10). By convention, due to the cultural and religious tightness of the nation, Ethiopians initiate sexual activity after marriage. Intercourse before 18 years old is prohibited by law (11). Despite of the above assumptions and legal issues, more than 60% of women start their sexual intercourse before they celebrate their 18 birth date (3, 5, 11-15).

Early sexual initiation has negative health, social and economic consequences for both the women and feature generation. It is a risk factor for sexually transmitted infection including HIV/AIDS (16-19), unsafe

sexual practice (8, 9, 20), unwanted pregnancy (18, 21-23), mental problem and maternal death (16, 18, 24, 25). It increase the risk of school dropout, poor school performance, stigma and discrimination (26-28). It also affects the social and economic status during adulthood (29).

In Ethiopia, different researches have been done on prevalence and/or factors associated with early sexual initiation in female adolescent and youth. Age, residence, educational status, parent- youth connectedness, using addictive substances and religion are determinant factors identified by scholars (3, 5, 11, 12, 14, 15, 30, 31). But, all the studies were done at local level, use small sample size, do not consider the effect of community level factors on early sexual initiation. Besides, the association at the individual level may not work at the community level and vice versa. Even the studies were fitted with standard logistic regression which may leads loss of power. Almost all were done in school students. National representative evidence is important to achieve the national and international goals. Therefore, this study aimed to assess individual and community-level factors associated with early sexual initiation among female youth in Ethiopia by using EDHS 2016which will be important to develop community level information education communication and behavioral change communication to reduce the prevalence and impact of early sexual initiation in the country.

Methodology

Study setting and period

The study was conducted in Ethiopia, which is located in the North-eastern (horn of) Africa, lies between 3^0 and 15^0 North latitude and 33^0 48^0 and East longitudes. This study used the 2016 EDHS dataset which was conducted by the Central Statistical Agency (CSA) in collaboration with the federal Ministry of Health (FMoH) and the Ethiopian Public Health Institute (32). Data were accessed from their URL: www.dhsprogram.com by contacting them through personal accounts after justifying the reason for requesting the data. Then reviewing the account permission was given via the email. A cross-sectional study design using secondary data analysis from 2016 EDHS was done among all female youth (15-24 years old) irrespective of their sexual activity.

A total of 6143 weighted females were include in the analysis. The weight is generated based EDHS suggestion as follows: (weight = v005/1,000,000). EDHS 2016 sample was stratified and selected in two stages. In the first stage, stratification was conducted by region and then each region stratified as urban and rural, yielding 21 sampling strata. A total of 645 (202 urban and 443 rural) enumeration areas (EAs) were selected with probability proportional to EA size in each sampling stratum. In the second stage affixed number of 28 households per cluster were selected with equal probability systematic selection from the newly created household listing.

Variable measurement

In this study the outcome variable (early sexual initiation) was dichotomized as (yes/no). Youth who started sexual activity at or before 18 years old were consider as having early sexual initiation and those

who start sexual act after 18 years old and not started yet during their youth time were considered as not having early sexual initiation which was generated from constructed EDHS-2016 variable (33). The independent variables were individual level factors including (age, religion, chat chewing, drinking alcohol, wealth index, educational status, media exposure) and community level factors were created by aggregating individual level factors in each cluster (region, residence, community level of education, community level wealth index, community level television exposure and community level radio exposure). The community level of wealth index was generated by using the proportion of the two (poorest and poorer) lowest level of wealth index to the total wealth index of the same cluster. Similarly community level of education is generated by using the proportion of the two (no education and primary education) lowest level of educational attainment to the total educational level of the same cluster. Community level of television exposure is also computed by dividing not exposed at all to television for the total television exposure, Community level of radio exposure is computed by dividing not exposed for radio at all to the total radio exposure. Since all the above four variables are not normally distributed we were using median as cutoff point (Above median: female youth live in a cluster with high proportion of poor community, low community educational status, low community media exposure) to dichotomize the variables.

Data processing and analysis

(see Supplementary Files)

Result

Characteristics of the Respondents

A total of 6,143 female youth included in the analysis. Among this, 3,383 (52.85%) were found in the age group of 19-24 years,1,889 (29.51%) study participants completed secondary and higher education. 3,845 (60.07%) of female youth had no exposure to television. About 4,676 (76.11%) of youth resided in rural areas (Table 1).

Table 1: Individual and community level characteristics of Female youth in Ethiopia, EDHS 2016 (n=6143).

Variable	Number	Percent
Age		
15-18	3,018	47.15
19-24	3,383	52.85
Religion		
Orthodox	2,613	40.82
Muslim	2,569	40.13
Others*	1,219	19.04
Educational status		
No education	1,408	22.00
Primary	3,104	48.49
Secondary	1,361	21.26
Higher	528	8.25
House hold Wealth index		
poorest	1,571	24.54
poorer	1,051	16.42
middle	1,183	18.48
richer	1,141	17.83
richest	1,455	22.73
Frequency of watching television		
not at all	3,845	60.07
less than once a week	805	12.58
at least once a week	1,751	27.36
Frequency of listening radio		
not at all	4,017	62.76
less than once a week	1,176	18.37
at least once a week	1,208	18.87
Ever heard about STI		
no	457	7.14
yes	5,944	92.86

Ever chewing chat		
no	6,024	94.11
yes	377	5.89
Ever drinking alcohol		
no	4,496	70.24
yes	1,905	29.76
Residence		
Urban	1,467	23.89
Rural	4,676	76.11
Region		
Tigray	498	8.10
Afar	56	0.92
Amhara	1,382	22.50
Oromia	2,229	36.29
Somali	186	3.03
Benishangul	67	1.08
SNNP	1,251	20.37
Gambela	18	0.30
Harari	16	0.26
Addis Ababa	403	6.56
Dire Dawa	37	0.60
Community level of wealth		
Low	3,159	51.43
High	2,984	48.57
Community level of education		
Low	2,827	46.03
High	3,316	53.97
Community level of television exposure		
Low	2,801	45.61
High	3,342	54.39
Community level of radio exposure		

No	3,350	54.53
Yes	2,793	45.47

*protestant, catholic, traditional

Individual and community-level factors associated with early sexual initiation

In the final model (model-III) age, educational status, ever chewing Chat, region and community level wealth had statistical association with early sexual initiation. The odds of early sexual initiation was 6 times more among participants whose aged between 19-24 years as compared to their counterparts [AOR=5.77, 95% CI= (4.58, 7.27)]. Female youth who were no attend school were 14 times more likely initiate sex at or before age 18 than attending higher education [AOR=14.1, 95% CI= (8.06, 24.66)]. Female youth who ever chew Chat were 2 times more likely initiate sex early as compared to not [AOR= 1.98,95%CI= (1.32, 2.97)]. Female youth who were live in Addis Ababa were 72% less likely initiate sex early as compared to youth live in Tigray region [AOR= 0.28, 95%CI= (0.17, 0.45)]. Likewise, female youth who were live in Gambella region were 3 times more likely initiate sex early as compared to youth who live in Tigray region [AOR=2.7,95%CI= (1.7, 4.29)]. Female youth who live in low proportion of poor communities were 34% less likely initiate sex early as compared to female youth who live in high proportion of poor community [AOR= 0.66, 95% CI= (0.49, 0.9)]. (Table 2).

Table 2: multilevel logistic regression analysis of individual and community level factors associated with early sexual initiation among female youth in Ethiopia, EDHS 2016 (n=6143).

e	COR	Model-0 ICC=22.59%	Model-I (AOR)	Model-II (AOR)	Model-III (AOR)
	5.11(4.1, 6.36)		5.6(4.45, 7.04)		**5.77 (4.58, 7.27)**
n					
ox					
	1.56 (1.234, 1.95)		1.27 (0.91, 1.76)		1.35 (0.95, 1.92)
	0.79(0.5, 1.05)		0.79 (0.57, 1.08)		1.06 (0.75, 1.49)
ional status					
cation	9.38(5.77, 15.26)		14.65 (8.5, 25.4)		**14.1 (8.06, 24.7)**
y	2.71(1.72, 4.27)		5.87(3.49, 9.88)		**5.91 (3.49, 10.0)**
ary	1.33 (0.81, 2.19)		2.3 (1.36, 3.89)		**2.32 (1.37, 3.93)**
hold Wealth index					
st	2.35 (1.62, 3.39)		1.09 (0.64, 1.83)		0.82 (0.47, 1.45)
er	2.51 (1.78, 3.54)		1.1 (0.68, 1.78)		0.92 (0.55, 1.52)
dle	2.54 (1.85, 3.48)		1.15 (0.71, 1.86)		1.04 (0.65, 1.69)
er	1.33(0.99, 1.77)		0.76 (0.49, 1.17)		0.71 (.46, 1.1)
st					

ıg television			
all	1.77 (1.3, 2.41)	0.93 (0.62, 1.42)	0.89 (0.58, 1.37)
ıan once a	1.29 (0.91, 1.83)	1.04 (0.71, 1.53)	0.95 (0.65, 1.41)
t once a			
ıg radio			
all	1.11 (0.85, 1.45)	0.86 (0.63, 1.17)	0.85 (0.62, 1.18)
ıan once a	0.77 (0.56, 1.04)		0.75 (0.54, 1.04)
t once a			
eard about STI			
	1.08 (0.72, 1.63)	1.43 (0.9, 2.28)	1.4 (0.88, 2.24)
ıewing chat			
	2.49 (1.72, 3.61)	2.03 (1.36, 3.02)	**1.98 (1.32, 2.97)**
inking alcohol			
	1.23 (1.02, 1.5)	1.4 (1.06, 1.84)	1.29 (0.97, 1.71)
nce			
	2.76 (2.19,	0.87 (.55,	1.11(0.65,

	3.47)	1.35)	1.92)
	2.39 (1.56, 3.66)	1.01 (0.66, 1.53)	0.89 (.53, 1.49)
a	1.18 (0.79, 1.77)	1.09 (0.75, 1.58)	1.07 (0.73, 1.58)
ı	0.94 (0.62, 1.43)	0.7 (0.48, 1.02)	**0.63 (.41, 0.97)**
	1.15 (0.75, 1.76)	0.54 (0.34, 0.83)	**0.45 (0.25,0.79)**
angul	1.18 (0.76, 1.84)	1.08 (0.70, 1.66)	1.11 (0.69, 1.78)
	0.53(0.35, 0.79)	.42 (0.29, 0.61)	**0.42 (0.26,0.67)**
la	1.89 (1.24, 2.86)	2.1 (1.43, 3.08)	**2.7 (1.7, 4.29)**
	1.06 (0.66, 1.7)	1.09 (0.72, 1.67)	0.82 (0.5, 1.36)
.baba	0.27 (0.18, 0.41)	0.39 (0.25, 0.6)	**0.28 (0.17, 0.45)**
ıwa	0.64 (0.4, 1.02)	0.66 (.42, 1.02)	**0.52 (0.31, 0.86)**
ınity level wealth			
	0.45 (0.32, 0.52)	0.58(0.44, 0.77)	**0.66 (0.49, 0.9)**
ınity level education			
	0.38 (0.31, 0.47)	0.58 (0.45, 0.76)	0.81 (0.6, 1.1)

ınity level television exposure			
	0.47 (.38, 0.59)	0.9 (0.68, 1.2)	1.02 (0.75, 1.38)
ınity level radio exposure			
	0.51 (0.41, 0.64)	0.99 (0.76, 1.29)	1.11(0.84, 1.47)

Random Effects (Measures of Variation)

Early sexual initiation among female youth varies significantly across each clusters. ICC indicated, 22.59 % of variation in early sexual initiation among female youth was attributed to community level factors. PCV in the final model shows 42.71% of variation in early sexual initiation across communities was explained. Likewise, MOR for early sexual initiation among female you, in the null model was 5.01which shows the presence of variation across each cluster (Table 3)

Table 3: Measure of variation for early sexual initiation among female youth at cluster level in multilevel logistic regression analysis, EDHS 2016.

Measure of variation	Model-0 (null)	Model-I	Model -II	Model-III
Variance	0.96	0.67	0.57	0.55
ICC (%)	22.59	16.92	14.77	14.32
PCV (%)	Reference	30.21	40.62	42.71
MOR	5.01	4.13	3.85	3.79
Model fitness				
Log-likelihood	-3727.4264	-3152.6852	-3647.3358	-3116.9657

Discussion

In the analysis the result of model-III showed that; Individual level factors (age, educational status and Chat chewing) and from community level factors (region and community level of wealth were determinant factors of early sexual initiation in Ethiopia.

Cohorts of youth from 19-24 years old are more likely start sex early sexual than cohorts of 15-18 years old. The finding is supported by a study conducted in Wollega, Ethiopia (19). It also congruent with studies conducted in Mexico and Korea (4, 7, 36-38). The possible reason for this association may be due to difference in cultural malpractices like early marriage and abduction were reduced in the last five years as the data represents at what age they started first sex. Moreover, improvement of youth friendly health service through time might be increased knowledge, normalization of sexuality issues, and improved self-efficacy (39)could contribute the difference in early sexual initiation in the two age group cohorts.

As the level of educational attainment increase the risk of early sexual initiation decrease. The finding is consistent with previous researches findings (11, 12, 23, 30, 31, 37, 38). This might be due to education increase information on the effect of early sexual initiation on their mental and social health. Education may bring behavioral change towards reduction of risk factors like, substance use which may expose them to early sexual initiation (40). Moreover, parent-youth communication and supervision might be good in youth who are educated (13, 14, 22, 25, 41).

Chewing Chat was positively associated with early sexual initiation. The finding is consistent with other studies (4, 5, 11, 16, 38, 42, 43). This might be due to substance use affects the intactness of critical thinking about the risk and consequences of early sexual intercourse (15, 22, 24, 25, 44). Moreover, they are more subjected to causal sex and they may use it as a means of income for substance use.

There is regional variation on early sexual initiation. Female youth who live in Addis Ababa, Dire Dawa, SNNPR, Oromia and Somali region are less likely initiate early sexual act when compared with youth who live in Tigray region. Whereas, female youth who live in Gambella region are more likely start early sexual activity than youth who live in Tigray region. Cultural, religious values and norms may be different across the regions. Cultural norms, social changes, family dynamics and government policies influence attitude and expression of sexual behavior in youth (13, 22, 25, 29, 45-47).

When low proportion of poor people lived in the cluster, initiation of early sex was decreased. This is also supported by a study conducted in (35). This might be due to rich peoples may have good health seeking behavior, better knowledge on risk factors, better follow up of their children, and access different behavioral change communication through mass media or social media. The above reasons may change the value and norms of the community towards early sexual initiation and early marriage (9, 16, 45). The result of this study was more representative than other studies and the model considered different levels of analysis as the outcome was affected by community level variables. Despites of this strength, the result may be prone to recall bias because the data were collected from history of event.

Conclusion

After computing multi-level analysis, cohort of old age, low educational status, ever chewing Chat, region and live in high proportion of poor community wealth had statistical association with early sexual initiation among female youth in Ethiopia. Improving universal access to education is important to reduce

the prevalence as well as health and health related complications of early sexual initiation. Advocacy and behavioral change communication among substance user should be area of concern for different organizations who are working on youth reproductive health. Since early sexual initiation differ across community differences, better to develop community sensitive approaches for different communities.

List Of Abbreviations

CSA-Central Statistics Agency, EA- Enumeration Area, ICC-inter cluster coefficient, MOR-Median Odds Ratio, PCV-Proportional Change Variance

Declarations

Ethical Approval and consent to participate

Ethical clearance was obtained from Ethical Review Committee of Wollo University College of Medicine and Health Science. An authorization letter to download EDHS-2016 data set was also obtained from CSA after requesting www.measuredhs.com website. The requested data were treated strictly confidential and was used only for the study purpose. No attempt was done to interact any individual respondent or household included in the survey. Complete information regarding the ethical issue was available in the EDHS-2016 report.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during this study are available from the corresponding author on reasonable request.

Funding

There was no specific funding for this study

Competing interests

The authors declare that they have no competing interests

Author's Contributions

MA: Initiated the research concept, analyze and interpreted the data; BK and MY: Wrote the manuscript and MA and MY: Edited and revised the manuscript. All authors: critically revise, read and approved the final manuscript.

Acknowledgements

The authors would like to acknowledge Ethiopian Central Statistical Agency for providing authorization letter to access EDHS-2016 dataset to conduct this study.

References

1. World Health Organization (WHO). Engaging young people for health and sustainable development: strategic opportunities for the World Health Organization and partners. 2018.
2. Gupta MD. The Power of 1.8 Billion: Adolescents, Youth and the transformation of the future: United Nations Population Fund; 2014.
3. Arega WL, Zewale TA, Bogale KA. Premarital sexual practice and associated factors among high school youths in Debretabor town, South Gondar zone, North West Ethiopia, 2017. BMC research notes. 2019;12(1):314.
4. Barragán V, Berenzon S, Tiburcio M, Bustos M, Villatoro J. Factors Associated with Sexual Debut in Mexican Adolescents: Results of the National Survey on Drug Use among Students in 2014. The journal of sexual medicine. 2019;16(3):418-26.
5. Bizuneh H. Correlates of sexual initiation among adolescent and youth in Addis Ababa, Ethiopia: a community based cross sectional study. MOJ Public Health. 2019;8(3):108-13.
6. Charlton BM, Nava-Coulter B, Coles MS, Katz-Wise SL. Teen pregnancy experiences of sexual minority women. Journal of pediatric and adolescent gynecology. 2019;32(5):499-505.
7. Lee G. Sexual behaviors and sexual experience of adolescents in Korea. Korea Academy Industrial Cooperation Society 2016; 17 (12): 71-80.
8. Lee J. The impact of sexual initiation timing and sexual experience on depressive symptoms in South Korean adolescents: Gender differences in a nationwide cross-sectional study. Journal of Pediatric Nursing. 2019.
9. Lee RLT, Yuen Loke A, Hung TTM, Sobel H. A systematic review on identifying risk factors associated with early sexual debut and coerced sex among adolescents and young people in communities. Journal of clinical nursing. 2018;27(3-4):478-501.
10. Buck T. International child law: Psychology Press; 2005.
11. Alemu B. Early marriage in Ethiopia: causes and health consequences. Exchange on HIV and AIDS, Sexuality and Gender. 2008;1:4-6.
12. Abay M, Endgashet S, Etana B, Nguse K. Magnitude of Premarital Sex and Associated Factors among Preparatory School Students in Alamata Town, North Ethiopia, 2014. Research & Reviews: A Journal of Health Professions. 2019;6(2):12-20.
13. Abebe M, Tsion A, Netsanet F. Living with parents and risky sexual behaviors among preparatory school students in Jimma zone, South west Ethiopia. African health sciences. 2013;13(2):498-506.

14. Yibrehu MS, Mbwele B. Parent-adolescent communication on sexual and reproductive health: the qualitative evidences from parents and students of Addis Ababa, Ethiopia. Reproductive Health. 2020;17:1-9.
15. Yohannes B, Gelibo T, Tarekegn M, Gelibo T. Prevalence and associated factors of sexually transmitted infections among students of Wolaita Sodo University, Southern Ethiopia. Int J Sci Technol Res. 2013;2(2):86-94.
16. Lindegren ML, Kennedy CE, Bain-Brickley D, Azman H, Creanga AA, Butler LM, et al. Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services. Cochrane Database of Systematic Reviews. 2012(9).
17. Maravilla JC, Betts KS, Alati R. Exploring the Risks of Repeated Pregnancy Among Adolescents and Young Women in the Philippines. Maternal and child health journal. 2019;23(7):934-42.
18. Prendergast LE, Toumbourou JW, McMorris BJ, Catalano RF. Outcomes of early adolescent sexual behavior in Australia: Longitudinal findings in young adulthood. Journal of Adolescent Health. 2019;64(4):516-22.
19. Tolera FH, Girma E, Mamo A, Babure ZK. Risky sexual behaviors and associated factors among high and preparatory school youth, East Wollega, Ethiopia, 2017: A cross-sectional study design. Journal of Public Health and Epidemiology. 2019;11:1-12.
20. LeGrand TK, Mbacké CS. Teenage pregnancy and child health in the urban Sahel. Studies in family planning. 1993:137-49.
21. Sprecher S, O'Sullivan LF, Drouin M, Verette-Lindenbaum J, Willetts MC. The Significance of Sexual Debut in Women's Lives. Current Sexual Health Reports. 2019;11(4):265-73.
22. Xu Y, Norton S, Rahman Q. Early life conditions and adolescent sexual orientation: A prospective birth cohort study. Developmental psychology. 2019.
23. Yeo JH, Park H, Kim E-Y. Predictors of the Timing of Sexual Intercourse Initiation among Adolescents in South Korea. Journal of community health. 2019;44(3):580-6.
24. Wells BE, Golub SA, Parsons JT. An integrated theoretical approach to substance use and risky sexual behavior among men who have sex with men. AIDS and Behavior. 2011;15(3):509-20.
25. Zhu G, Bosma AK. Early sexual initiation in Europe and its relationship with legislative change: A systematic review. International Journal of Law, Crime and Justice. 2019;57:70-82.
26. Bugssa G, Dimtsu B, Alemayehu M. Socio demographic and maternal determinants of low birth weight at mekelle hospital, northern ethiopia: a cross sectional study. Am J Adv Drug Deliv. 2014;2(5):609-18.
27. Gebremedhin M, Ambaw F, Admassu E, Berhane H. Maternal associated factors of low birth weight: a hospital based cross-sectional mixed study in Tigray, Northern Ethiopia. BMC pregnancy and childbirth. 2015;15(1):222.
28. Tema T. Prevalence and determinants of low birth weight in Jimma Zone, Southwest Ethiopia. East African medical journal. 2006;83(7):366.

29. França MTA, Frio GS. Factors associated with family, school and behavioral characteristics on sexual initiation: A gender analysis for Brazilian adolescents. PloS one. 2018;13(12).
30. Girmay A, Mariye T. Risky sexual behavior practice and associated factors among secondary and preparatory school students of Aksum town, northern Ethiopia, 2018. BMC research notes. 2019;12(1):698.
31. Girmay A, Marye T, Gerensea H. Factors determining premarital sexual practice of school students, institutional based cross sectional study in northern Ethiopia. 2019.
32. Kashitala J, Nyambe N, Mwalo S, Musamba J, Chishinga N, Kasonde P, et al. Is male involvement in ANC and PMTCT associated with increased facility-based obstetric delivery in pregnant women? African Journal of Reproductive Health. 2015;19(2):116-23.
33. EDHS E. demographic and health survey 2016: key indicators report. The DHS Program ICF. 2016;363:364.
34. Christ O, Hewstone M, Schmid K, Green EG, Sarrasin O, Gollwitzer M, Wagner U. Advanced multilevel modeling for a science of groups: A short primer on multilevel structural equation modeling. Group Dynamics: Theory, Research, and Practice. 2017 Sep;21(3):121.
35. Brault MA, Ngure K, Haley CA, Kabaka S, Sergon K, Desta T, Mwinga K, Vermund SH, Kipp AM. The introduction of new policies and strategies to reduce inequities and improve child health in Kenya: A country case study on progress in child survival, 2000-2013. PLoS One. 2017 Aug 1;12(8):e0181777.
36. Finer LB, Philbin JM. Sexual initiation, contraceptive use, and pregnancy among young adolescents. Pediatrics. 2013;131(5):886-91.
37. Girmay A, Mariye T, Gerensea H. Early sexual debut and associated factors among secondary school students of central zone of Tigray, Northern Ethiopia, 2018. The Pan African Medical Journal. 2019;34.
38. Waktole ZD. Sexual behaviors and associated factors among youths in Nekemte town, East Wollega, Oromia, Ethiopia: A cross-sectional study. PloS one. 2019;14(7).
39. Rahmani A, Merghati-Khoei E, Fallahi A. Perceived advantages and disadvantages of sex education in young women: A qualitative study. International Journal of High Risk Behaviors and Addiction. 2018;7(2):57-61.
40. Coyne SM, Ward LM, Kroff SL, Davis EJ, Holmgren HG, Jensen AC, et al. Contributions of mainstream sexual media exposure to sexual attitudes, perceived peer norms, and sexual behavior: a meta-analysis. Journal of Adolescent Health. 2019.
41. Wong WCW, Choi EP, Holroyd E, Ip P, Fan S, Yip PS. Impact of household composition and satisfaction with family life on self-reported sexual health outcomes of high-school students in Hong Kong. BMJ sexual & reproductive health. 2019.
42. Park S, Kim Y. Prevalence, correlates, and associated psychological problems of substance use in Korean adolescents. BMC public health. 2015;16(1):79.
43. Shoveller JA, Johnson JL, Langille DB, Mitchell T. Socio-cultural influences on young people's sexual development. Social science & medicine. 2004;59(3):473-87.

44. Waldron M, Doran KA, Bucholz KK, Duncan AE, Lynskey MT, Madden PA, et al. Parental separation, parental alcoholism, and timing of first sexual intercourse. Journal of Adolescent Health. 2015;56(5):550-6.
45. Commendador KA. Parental influences on adolescent decision making and contraceptive use. Pediatric Nursing. 2010;36(3):147.
46. Fomby P, Cherlin AJ. Family instability and child well-being. American sociological review. 2007;72(2):181-204.
47. Le GT, Deardorff J, Lahiff M, Harley KG. Intergenerational associations between parental incarceration and children's sexual risk taking in young adulthood. Journal of Adolescent Health. 2019;64(3):398-404.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Dataprocessingandanalysis.pdf