Individual and Community Level Factors Associated with Early Sexual Initiation Among Female Youth in Ethiopia: A Multilevel Analysis of 2016 Ethiopian Demographic and Health Survey.

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Abstract

Background: There is limited national representative evidence on determinants of early sexual act among youth (female) especially community level factors are not investigated in Ethiopia. Thus, this study aimed to assess individual and community level factors associated with early sexual initiation among female youth in Ethiopia.

Method: A secondary data analysis was done on the 2016 Ethiopian Demographic and Health Survey (EDHS) dataset was collected cross-sectional. A total of 6143 15-24 years’ old females irrespective of their sexual activity were included in the analysis. Multi-level mixed-effect logistic regression analysis was done by STATA version 14.0 to identify individual and community-level factors. Adjusted odds ratio 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.

Result: Individual level factors significantly associated with early sexual initiation among female youth were; age group from 19-24 years [AOR=5.77, 95% CI= (4.58, 7.27)], not attend school [AOR=14.1, 95% CI= (8.06, 24.66)], ever chew Chat [AOR= 1.98, 95%CI= (1.32, 2.97)]. From community label variables living in Addis Ababa [AOR= 0.28, 95%CI= (0.17, 0.45)], living in Gambella [AOR=2.7, 95%CI= (1.7, 4.29)] and live in low proportion of poor communities [AOR= 0.66, 95% CI= (0.49, 0.9)] were significantly associated with early initiation of sexual intercourse of female youth.

Conclusion: Increased 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. Improving educational coverage, improving community level wealth status are important interventions to delay the age of first sexual act among female youth.

Introduction

Even though, different countries and organizations have different age classification of youth, according to WHO, UNFPA and UNICEF age 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. It is accompanied by semi economical dependency (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. 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. By convention, due to the cultural and religious tightness of the nation, Ethiopian initiate sexual act after marriage. Initiating sexual intercourse before 18 years old is prohibited by law (10).
Despite of the above assumptions and legality issues, more than 60% of women start their sexual act before they celebrate their 18 birth date (3, 5, 10–14).

Early sexual debut 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 (15–18), unsafe sexual practice (8, 9, 19), unwanted pregnancy (17, 20–22), mental problem and maternal death (15, 17, 23, 24). Low birth weight and mortality is affected by maternal age. It increase the risk of school dropout, poor school performance, stigma and discrimination (if it occurs before marriage) (25–27). It affects the social and economic status during adulthood (28).

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 different scholars (3, 5, 10, 11, 13, 14, 29, 30). But all the studies are done at local level, use small unweight sample size, do not consider the effect of community level factors on early sexual debut. Almost all are done in school students. Ethiopia has reproductive health strategy in general, adolescent and youth reproductive health strategy to reduce reproductive problems. But still reproductive health problems are prevalent in the nation. National representative evidence is important to track the national and international goals. Identifying, factors (community and individual level) associated early sexual initiation among female youth is important to develop community level information education communication and behavioral change communication strategies to reduce the magnitude and impact of early sexual act among female youth population.

**Methodology**

**Study setting and period**

The study was conducted in Ethiopia, which is located in the North-eastern (horn of) Africa, lies between $3^\circ$ and $15^\circ$ North latitude and $33^\circ$ $48^\circ$ and East longitudes.

This study used the EDHS 2016 dataset which was conducted by the Central Statistical Agency (CSA) in collaboration with the federal Ministry of Health (FMoF) and the Ethiopian Public Health Institute (EPHI). Data were accessed from their URL: [www.dhsprogram.com](http://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 from 2016 Ethiopian demography and health survey was conducted. All female (15–24 years old) were included irrespective of their sexual act. A total of 6143 weighted 15–24 years old female were include. 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 start sexual act at and 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. The independent variables were individual level variable including (age, religion, chat chewing, drinking alcohol, wealth index, educational status, media exposure) and community level variables which were created by taking aggregate measures from individual level variables in each cluster (region, residence, community level education, community level wealth index, community level television exposure and community level radio exposure). The community level wealth index is 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, low educational status, low media exposure community) to dichotomize the variables.

Data processing and analysis

Data cleaning was conducted to check for the consistency with the EDHS-2016 descriptive report. Recoding, variable generation, labeling and analysis were done by using STATA/SE version 14.0.

Descriptive statistics were done to describe the study participants in relation to socio-demographic characteristics which were presented in tables and text. Sample weight (gen wt = v005/1000, 000) was used to compensate the unequal probability of selection between the strata that were geographically defined and for non-responses. Multilevel analysis was conducted after checking the data was eligible to multilevel analysis (by using intra-cluster correction coefficient. When the ICC is greater than 10% (ICC = 22.5%) the community level factors affects the dependent variable. There for it is better to identify community level factors to develop and take different interventions. Since EDHS data are hierarchical (individual “level 1” were nested with in community “level 2”), a two level mixed effects logistic regression model was fitted to estimate both independent (fixed) effects of the explanatory variables and community –level random effects on early sexual initiation among 15–24 years old female. The log of
the probability of early sexual initiation was modeled using a two level multilevel model as follows: 

$$\frac{\pi_{ij}}{1-\pi_{ij}} = \beta_0 + \beta_1 X_{ij} + B_2 Z_{ij} + \mu_j + e_{ij}$$

Where I and j are individual level (1) and community level (2) unites respectively; X and Z refers to individual and community level variables respectively; is the probability of early sexual initiation for the $i^{th}$ youth in the $j^{th}$ community; $\beta$'s indicates the fixed coefficients. ($B_0$) is the intercept, the effect on the probability of early sexual initiation in the absence of influencing factors; and $\mu_j$ showed the random effect (the effect of the community on early sexual initiation of the $j^{th}$ community) and $e_{ij}$ showed random errors at individual level. By assuming each community had different intercept ($B_0$) and fixed coefficient ($\beta$), the clustered data nature and intra and inter community variations were taken into account.

During analysis first, bivariable multilevel logistic regression was fitted and variables with p value less than 0.2 at model I and model II were selected to develop the 3rd model (the final model). The analysis was done in four models. The first model was, model-0 (empty model or null model/ without explanatory variable; to secure the need to multilevel analysis). The second model was, model-I (analyzing only individual level variable), the 3rd model was, model-II (analyzing only community level variable), the last model, model-III (analyzing both community level and individual level variables based on the cutoff point).

The measure of association (fixed effects) estimate the association between the likelihood of early sexual initiation among female youth and different explanatory factors were expressed by Adjusted Odds Ratio (AOR) with respective 95% confidence level. Variables with p-value less than 0.05 at model-III were significantly associated with early sexual initiation. The random-effects (variations) were measured by using ICC (model-0), Median Odds Ratio (MOR) in (model-I and II) and Proportional Change in Variance (PCV) was measured to show variation between clusters.

ICC shows the variation in early sexual initiation among female youth due to community characteristics. The higher the ICC, the community characteristics are more relevant to understand individual variation for early sexual initiation. It is calculated as: 

$$\text{ICC} = \left( \frac{\hat{\delta}^2}{\hat{\delta}^2 + \hat{\sigma}^2} \right)$$

where $\hat{\delta}^2$ indicates estimated variance of clusters.

MOR is the median value of the odds ratio between the area at highest risk and the area the lowest risk when randomly picking out two areas and it was calculated as: 

$$\text{MOR} = \exp \left( \sqrt{2 \times \hat{\delta}^2 + .6745} \right) \approx \exp^{0.95\hat{\delta}}.$$ 

In this study, MOR shows the extent to which the individual probability of early sexual initiation for female youth determined by place of residence. PCV measures the total variation attributed by individual level variables and area (community) level variables in the final model (model-III).
It is calculated as 

$$PCV = \frac{(\delta^2 \text{ of null model} - \delta^2 \text{ of each model})}{\delta^2 \text{ of null model}}.$$ 

Multicollinearity was checked among explanatory variables by using standard error at cutoff point ± 2. There is no multicollinearity that is the standard errors were between ± 2. The log likelihood test was used to estimate the goodness of fit of the adjusted final model (model-III) in comparison to the preceding models (model-I and model-II) individual and community model adjustments respectively.

**Result**

**Characteristics of the Respondents**

A total of 6,143 female youth included for 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).
| 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 to radio** | | |
| not at all                    | 4,017  | 62.76   |
| less than once a week         | 1,176  | 18.37   |

*protestant, catholic, traditional
| Variable                               | Number | Percent |
|----------------------------------------|--------|---------|
| 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    |
| Penishangul                            | 67     | 1.08    |
| Snnpr                                  | 1,251  | 20.37   |
| Gambela                                | 18     | 0.30    |
| Harari                                 | 16     | 0.26    |
| Adiss ababa                            | 403    | 6.56    |
| Dire dawa                              | 37     | 0.60    |
| **Community level wealth**             |        |         |
| Low                                    | 3,159  | 51.43   |

*protestant, catholic, traditional
| Variable                        | Number | Percent |
|--------------------------------|--------|---------|
| High                           | 2,984  | 48.57   |
| **Community level education**  |        |         |
| Low                            | 2,827  | 46.03   |
| High                           | 3,316  | 53.97   |
| **Community television exposure** |       |         |
| Low                            | 2,801  | 45.61   |
| High                           | 3,342  | 54.39   |
| **Community level 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 among female youth**

In the final model (model-III) age, educational status, ever chewing Chat, region and community level wealth had statistical association with early sexual initiation. Study participants aged from 19–24 years were 6 times more likely initiate early sexual act as compared to female youth below 18 years old [AOR = 5.77, 95% CI= (4.58, 7.27)]. Female youth who were no attend school were times more likely initiate early sexual intercourse when compared with attending higher education [AOR = 14.1, 95% CI= (8.06, 24.66)]. Female youth who ever chew Chat were 2 times more likely initiate early sexual debut when compared with none chewer female youth [AOR = 1.98,95%CI= (1.32, 2.97)]. Female youth who were live in Addis Ababa were 72% less likely initiate early sexual act when compared with 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 early sexual act when compared with youth 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 early sexual act when compared with 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).

| Variable | COR       | Model-0 ICC = 22.59% | Model-I (AOR) | Model-II (AOR) | Model-III (AOR) |
|----------|-----------|----------------------|---------------|----------------|-----------------|
| Age      |           |                      |               |                |                 |
| 15–18    |           |                      |               |                |                 |
| 19–24    | 5.11(4.1, 6.36) | 5.6(4.45, 7.04) | 5.77 (4.58, 7.27) |
| Religion |           |                      |               |                |                 |
| Orthodox |           |                      |               |                |                 |
| Muslim   | 1.56 (1.234, 1.95) | 1.27 (0.91, 1.76) | 1.35 (0.95, 1.92) |
| Others   | 0.79 (0.5, 1.05) | 0.79 (0.57, 1.08) | 1.06 (0.75, 1.49) |
| Educational status |           |                      |               |                |                 |
| No education | 9.38(5.77, 15.26) | 14.65 (8.46, 25.37) | 14.1 (8.06, 24.66) |
| Primary | 2.71 (1.72, 4.27) | 5.87 (3.49, 9.88) | 5.91 (3.49, 10.01) |
| Secondary | 1.33 (0.81, 2.19) | 2.3 (1.36, 3.89) | 2.32 (1.37, 3.93) |
| Higher   |           |                      |               |                |                 |
| House hold | Wealth index |                      |               |                |                 |
| poorest | 2.35 (1.62, 3.39) | 1.09 (0.64, 1.83) | 0.82 (0.47, 1.45) |
| poorer | 2.51 (1.78, 3.54) | 1.1 (0.68, 1.78) | 0.92 (0.55, 1.52) |
| middle | 2.54 (1.85, 3.48) | 1.15 (0.71, 1.86) | 1.04 (0.65, 1.69) |
| richer | 1.33 (0.99, 1.77) | 0.76 (0.49, 1.17) | 0.71 (.46, 1.1) |
| richest |           |                      |               |                |                 |
| watching television |           |                      |               |                |                 |
| Variable                        | COR       | Model-0 ICC = 22.59% | Model-I (AOR) | Model-II (AOR) | Model-III (AOR) |
|--------------------------------|-----------|----------------------|---------------|----------------|-----------------|
| not at all                     | 1.77 (1.3, 2.41) | 0.93 (0.62, 1.42) | 0.89 (0.58, 1.37) |
| less than once a week           | 1.29 (0.91, 1.83) | 1.04 (0.71, 1.53) | 0.95 (0.65, 1.41) |
| at least once a week            |           |                      |               |                |
| **listening radio**             |           |                      |               |                |
| not at all                     | 1.11 (0.85, 1.45) | 0.86 (0.63, 1.17) | 0.85 (0.62, 1.18) |
| less than once a week           | 0.77 (0.56, 1.04) |                      | 0.75 (0.54, 1.04) |
| at least once a week            |           |                      |               |                |
| **Ever heard about STI**        |           |                      |               |                |
| no                             |           |                      |               |                |
| yes                            | 1.08 (0.72, 1.63) | 1.43 (0.9, 2.28) | 1.4 (0.88, 2.24) |
| **Ever chewing chat**          |           |                      |               |                |
| no                             |           |                      |               |                |
| yes                            | 2.49 (1.72, 3.61) | 2.03 (1.36, 3.02) | 1.98 (1.32, 2.97) |
| **Ever drinking alcohol**      |           |                      |               |                |
| no                             |           |                      |               |                |
| yes                            | 1.234039 (1.02, 1.5) | 1.4 (1.06, 1.84) | 1.29 (0.97, 1.71) |
| **Residence**                  |           |                      |               |                |
| Urban                          |           |                      |               |                |
| Rural                          | 2.76 (2.19, 3.47) | 0.87 (.55, 1.35) | 1.11(0.65, 1.92) |
| **Region**                     |           |                      |               |                |
| Tigray                         |           |                      |               |                |
| Variable          | COR      | Model-0 ICC = 22.59% | Model-I (AOR) | Model-II (AOR) | Model-III (AOR) |
|-------------------|----------|----------------------|---------------|----------------|-----------------|
| Afar              | 2.39 (1.56, 3.66) |                       | 1.01 (0.66, 1.53) | 0.89 (.53, 1.49) |
| Amhara            | 1.18 (0.79, 1.77) |                       | 1.09 (0.75, 1.58) | 1.07 (0.73, 1.58) |
| Oromia            | 0.94 (0.62, 1.43) |                       | 0.7 (0.48, 1.02) | 0.63 (.41, 0.97) |
| Somali            | 1.15 (0.75, 1.76) |                       | 0.54 (0.34, 0.83) | 0.45 (0.25, 0.79) |
| Penishangul       | 1.18 (0.76, 1.84) |                       | 1.08 (0.70, 1.66) | 1.11 (0.69, 1.78) |
| Snnpr             | 0.53 (0.35, 0.79) |                       | .42 (0.29, 0.61) | 0.42 (0.26, 0.67) |
| Gambela           | 1.89 (1.24, 2.86) |                       | 2.1 (1.43, 3.08) | 2.7 (1.7, 4.29)  |
| Harari            | 1.06 (0.66, 1.7)  |                       | 1.09 (0.72, 1.67) | 0.82 (0.5, 1.36) |
| Adiss ababa       | 0.27 (0.18, 0.41) |                       | 0.39 (0.25, 0.6) | 0.28 (0.17, 0.45) |
| Dire dawa         | 0.64 (0.4, 1.02)  |                       | 0.66 (.42, 1.02) | 0.52 (0.31, 0.86) |

**Community level wealth**

| Low               | 0.58 (0.44, 0.77) | 0.66 (0.49, 0.9) |
| High              |                    |                  |

**Community level education**

| Low               | 0.38 (0.31, 0.47) | 0.58 (0.45, 0.76) | 0.81 (0.6, 1.1) |
| High              |                    |                  |

**Community level television exposure**

| Low               | 0.47 (.38, 0.59)  | 0.9 (0.68, 1.2)  | 1.02 (0.75, 1.38) |
Variable | COR | Model-0 ICC = 22.59% | Model-I (AOR) | Model-II (AOR) | Model-III (AOR)
---|---|---|---|---|---
Community level radio exposure | | | | | |
Low | 0.51 (0.41, 0.64) | 0.99 (0.76, 1.287) | 1.11 (0.84, 1.47) |
High | | | | | |

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 5.01 which 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 of model-III; age, educational status, chewing Chat (individual level factors), religion and community level of wealth (community level factors) are determinant factors of early sexual initiation in Ethiopia.

Cohorts of youth from 19–24 years old are more likely start early sexual act than cohort of 15–18 years old. The finding is supported by other studies (4, 7, 18, 31–33). Educational coverage, improvement of
youth friendly health service through time might be the responsible factor for the difference 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 similar findings (10, 11, 22, 29, 30, 32, 33). Educated youth might be get formal or informal information on the effect of early sexual initiation on their health, social and economic achievement. Moreover, parent-youth communication and supervision might be good in youth who are in class (12, 13, 21, 24, 34). Education may bring behavioral change towards reduction of risk factors like, substance use which may expose them to early sexual initiation (35).

Chewing Chat is positively associated with early sexual initiation. The finding is inconsistent with other studies (4, 5, 10, 15, 33, 36, 37). Addictive substance are risk factors for risk sexual behavior including early initiation, incorrect and inconsistent condom use, and multiple sexual partner. Substance utilization affects the intactness of critical thinking about the risk and consequences of early sexual intercourse (14, 21, 23, 24, 38).

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 (12, 21, 24, 28, 39–41).

When low proportion of poor people live in the cluster (community), initiation of early sexual debut is decreased. 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 about early sexual initiation and early marriage (9, 15, 39).

**Conclusion**

Increased 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.

Improving universal access to education is important to reduce the prevalence as well as health and health related complications of early sexual debut. Even though, the country gives high emphasis to educational sector, it is better to give emphasis assuring gender equity in educational sector. In Ethiopia, chat is exported plant and not under illicit drug list in the country. Different farm lands are covered by chat plant due to its hard currency. It is risk factor for different health, social and economic problem. Therefore, it needs the government due attention to take intervention. The goal of Ethiopian youth reproductive strategy is full filling reproductive need of culturally diversified youth. Since 22.6% early
initiation of sexual activities are due to community difference, better 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.

Competing interests

The authors declare that they have no competing interests.

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Author’s Contributions
MA: initiated the research concept, analyze and interpreted the data; BK, MY and YD: wrote the manuscript; all authors: critically revise, read and approved the final manuscript. All authors have equal participation.

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