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Unmet need for modern contraceptives and associated factors among HIV positive reproductive age women attending at ART clinic in government hospitals Addis Ababa, Ethiopia

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Abstract

Introduction: *Every year in Ethiopia, 84,189 pregnancies occur among Human Immune Virus positive women and around 14,140 HIV-positive babies are born. Unmet need for contraceptives is a major cause of unintended pregnancy among HIV-positive women. However, the magnitude of unmet needs among HIV-positive reproductive-age women is not well known in Addis Ababa. The objective of this study was to determine the unmet need for modern contraceptives and its associated factors among HIV-positive reproductive-age women attending antiretroviral therapy clinics at government hospitals in Addis Ababa, Ethiopia.* ***Methods:*** *institutional based cross-sectional study was conducted among 724 HIV-positive reproductive-age women at ART clinics of governmental hospitals in Addis Ababa, Ethiopia from November 2019 to December 2019. Variables that had a p-value of ≤ 0.2 during bivariable analyses were entered into the multivariable logistic regression model to identify their independent effects. The degree of association was declared using an adjusted odds ratio with a 95% confidence interval.* ***Results:*** *the prevalence of unmet need for modern contraceptives among HIV positive reproductive age women who were on ART was 23.8% with 95% CI: (20.7, 26.9), of which 13.3% had unmet need for limiting and 10.5% for spacing. Factors like women age between 15-24 years (AOR=21.3, 95% CI: 8.69, 30.01] and 25-34 years (AOR=5.4, 95% CI: 3.08, 9.57), had no formal education (AOR=3.2, 95% CI: 1.06,10.01) and had primary education (AOR=2.17,95% CI: 1.14, 4.12), number of live children 1-2 (AOR=5.05, 95% CI: 2.32, 10.99), no desire to have children in the future (AOR=6.31: 95% CI: 3.82- 10.41), partner opposition (AOR=2.8, 95% CI: 1.73, 4.59), previously none-use of modern contraceptives (AOR=1.7, 95% CI: 1.12, 2.68, fear of method side effect (AOR=3.23, 95% CI: 1.85, 5.64) and did not getting counseling on modern contraceptives in ART unit (AOR=2.1, 95% CI: 1.39, 3.27) were found to have statistically significant association with unmet need for modern contraceptives.* ***Conclusion:*** *in this study, we found a high proportion of unmet need for modern contraceptives reproductive-age women who were on ART had. Age 15-24 years and 25-34 years, low educational status, number of alive child 1-2, no desire to have children, partner opposition, previously none-use of modern contraceptives, fear of method side effect and did not get counseling for modern contraceptives in ART unit were identified associated factors of unmet need for modern contraceptives. Therefore, integration of family planning services at ART clinic and increased attention to less educated women, young women and previously none use of family planning is recommended.*

Introduction

Globally in 2017, 36.9 million people were living with HIV, of these 35.1 million adults and 1.8 million children (<15 years). Around 1.8 million people became newly infected with HIV, 940, 000 people died from AIDS-related illnesses, 77.3 million people have become infected with HIV and 35.4 million people have died from AIDS-related illnesses since the start of the epidemic. About 59% of adults and 52% of children aged 0-14 years living with HIV had access to treatment as well as 80% of pregnant women living with HIV had access to antiretroviral medicines to prevent transmission of HIV to their baby [1]. In sub-Saharan Africa, HIV infection continues to be a public health problem where 25.6 million people lived with HIV. Women of reproductive age (15-49 years) account for about two-thirds of them [2]. About 66 000 children under 14 years were reported to be newly infected by HIV in Western and Central Africa at the end of 2015, and most of these infections could have been prevented by antiretroviral therapy (ART) during pregnancy and more by contraceptive use among HIV-infected women, which is the one component of preventing HIV mother-to-child transmission [3]. Ethiopia is one of the countries that most affected by the HIV/AIDS pandemic. About 1.2 million

people were living with HIV/AIDS with an adult prevalence rate of 1.1% in 2016. Every year in the country, 84,189 pregnancies occur among HIV-positive women and around 14,140 HIV-positive babies are born [4]. In 2010, estimated that nearly 80,000 children under the age of 15 years were living with HIV, and more than 90% of the infections were due to vertical transmission from mother to child. WHO promotes the prevention of unintended pregnancy among women living with HIV as one of its key strategies in preventing HIV transmission to infants and children [5].

Mother to child HIV transmission is related to low use of contraceptives, low institutional deliveries and high unintended pregnancies [6]. Preventing unintended pregnancies among women living with or at-risk of contracting, human immune virus (HIV) is a key component of the global HIV prevention strategy. An estimated 20%-30% of HIV infections in newborns will be averted if unintended pregnancies are prevented among HIV-positive women [7]. While, the majority of the prevention of mother-to-child transmission of HIV (PMTCT) efforts have focused on the delivery of antiretroviral therapy (ART) to mothers and their infants, modeling efforts have shown that preventing unintended pregnancies through the provision of modern contraceptives services is more cost-effective compared to ART alone [4,6]. WHO defines an unmet need for family planning as a percentage of women of reproductive age who are married or in a union, fecund and sexually active but not using any method of contraceptives for neither spacing nor limiting children and percentage of pregnant or postpartum amenorrhoeic women with unwanted or mistimed pregnancies/births, and not using contraceptives at the time of last conception [8]. The unmet need for modern contraceptives among HIV-positive women is one of the important factors which contributes to unwanted pregnancy and vertical transmission of the virus to a child [9]. However, the prevalence of the unmet need for modern contraceptives and its determinants among HIV-positive women who are living with HIV/AIDS is not well documented in Addis Ababa. Therefore, this study was implemented to determine the unmet need for modern contraceptives and its association among HIV-positive reproductive-age women who were on ART in Addis Ababa, Ethiopia. The finding of this study will help in strengthening programs designed to reduce mother-to-child transmission (MTCT) of HIV and family planning programs.

Methods

Study design and period: an institutional based cross-sectional study was conducted among HIV-positive reproductive age women attending ART clinic from November to December 2019.

Study area: the study was conducted in Addis Ababa, which is the capital city of Ethiopia and the seat of the African Union and the united nation world economic commission for Africa. It covers an area of 527 square kilometers and has 10 sub-cities and 117 woredas. Based on the 2007 census conducted by the central statistical agency of Ethiopia (CSA), Addis Ababa city has a total population of 3,384,569. The city has 52 hospitals of these, 13 are governmental hospitals [10]. The study was conducted in 4 randomly selected government hospitals namely (Zewditu Memorial Hospital, Yekatite 12 Millennium Medical College Hospital, Gandhi Memorial Hospital and Rasdesta Damtew Memorial Hospital). The department of HIV counseling and testing and ART unit are among other departments of the hospitals including follow-up clinics, wards and an outpatient department.

Population: all reproductive age group women who were on ART attending HIV/AIDS care and treatment service at public hospitals in Addis Ababa was the source of population. All reproductive age women who were married or in the union, attending HIV/AIDS care and treatment in the selected public hospitals was the study population.

Sample size and sampling procedure: a single population proportion formula was used to estimate the required sample size. The following

assumptions were used to estimate the sample size: The prevalence of unmet need for contraceptives among HIV positive women on ART was 25.1% from the previously published article [11], 95% confidence level, a margin of error of 4%, design effect of 1.5 and 10% none response rate. The detailed calculation as follow:

$$n = \frac{(\frac{Z\alpha}{2})^2 \, x \, p \, x \, (1-p)}{d^2}$$

where, n= the required sample size, Z/2=the critical value at 95% confidence level of certainty (1.96), p=the proportion of unmet need for contraceptives among HIV positive women (25.1%), d=the margin of error between the sample and the population (4%). Then;

$$n = \frac{(1.96)^2 x 0.251 x (1-0.251)}{0.04^2} = 451$$

After the design effect and non-response rate were considered the final sample size of the study was 743 HIV-positive reproductive age women attending at ART clinic. Out of 13 public hospitals giving ART service in Addis Ababa, four hospitals were randomly selected in the rule of thumb. The calculated sample size is proportionally allocated to each selected Hospital based on the number of monthly ART reproductive age women case flow. Study subjects were selected consecutively until the allocated sample size fulfilled at each ART facility considering their attendance at the ART clinic is random based.

Operational definition

Unmet need for modern family planning: the sum of the percentage of a woman who is in sexual union and fecund women do not want any more children or want to postpone pregnancy for at least two years, but she is not using a contraceptive method and currently pregnant or postpartum amenorrhoeic women being pregnant earlier than she desired or do not want a child at all, but don't use the contraceptive method during conception [6,12].

Unmet need for limiting: the sum of the proportion of women who is married/sexual union and fecund who do not want any more children and currently pregnant or postpartum amenorrheic who do not want a child at all but she is not using a contraceptive [6].

Unmet need for spacing: the sum of the proportion of women who is married/sexual union and fecund women who want to postpone pregnancy for at least two years and current pregnant or postpartum amenorrhoeic women being pregnant earlier than she desired but, don´t use a modern contraceptive method [6,12].

Cohabiting: referred to women responded as they are living in the union but legal marriage has not established.

Infecund: women have first married five or more years ago, have not had a birth in the past five years, are not currently pregnant, and have never used any kind of contraceptive method or self-report that they are infecund, menopausal or have had a hysterectomy, never menstruated, or have been postpartum amenorrheic for 5 years and longer or their last menstrual period occurred more than six months before the study period [13].

Data collection procedure and quality assurance: reproductive age women who came for follow-up in the ART clinic during the data collection period interviewed using pre-tested and structured questionnaire tools adapted from different literatures [11,14,15]. The questionnaire was first developed in English and translated into Amharic version and re-translated back to English by language experts to assure its consistency. Amharic version was used to collect required data and the data was collected by 4 clinical nurses working in ART units of the same facilities. Nurses working in the ART unit of the same facility were preferred for data collection to maintain confidentiality and

participant safety. To ensure data quality, training was given for 4 data collectors and 2 supervisors about the objective and relevance of the study, confidentiality of the information, and informed consent and to make them familiar with the data collection questionnaire. The pretest was conducted on 5% (37) women in the same city but different health institutions (i.e. Kirkos health center). After the pretest; grammatical errors, logical flow of the questioners were corrected. The principal investigator was closely supervised the data collection process and all the questionnaires checked for completeness.

Data management analysis: the collected data were cleaned, coded, and entered into Epi- Data and exported to SPSS version 20 software for further analysis. Descriptive statistics such as frequencies, means, standard deviation and percentage carried out. Text, table and figure were used to present the results of the study. For continuous variables normality test was examined the probability plot and assess how closely the data points follow the fitted distribution line. To assess multicollinearity in the regression model the variance inflation factors (VIF) were estimated to identify the correlation between independent variables and the maximum VIF value found 2.41. Bivariable analyses were done for each independent variable and the outcome variable to select variables for the multivariable analyses. Variables that had a p-value of ≤ 0.2 during bivariable analyses entered into the multivariable logistic regression model to identify their independent effects. Hosmer and Leme-show goodness of fit test was done to test the fitness of the model and its p-value was 0.213. An adjusted odds ratio was used to measure the strength of association between the dependent and independent variables while a 95% confidence interval and p-value <0.05 was used to see the significance of the association.

Ethical approval and consent for participants: ethical clearance for the study was obtained from the institutional review board (IRB) of the University of Gondar, Institute of Public Health. Formal letter of cooperation submitted to selected hospitals to get permission to carry out the study. Written consent was obtained from each participant after explaining the purpose and procedure of the study. The eligible study participants enrolled in the study only after they gave informed consent and not been forced to participate. The information regarding the study participants was kept confidential by using specific identification for each of them. All interviews were conducted in the same place where the study participants take their treatment to keep privacy (exit interview in a private room). A complete questionnaire was kept in a safe place and they were for the study only. Data were locked by password and stored on computers that were accessed only by the investigators.

Results

Demographic and socio-economic characteristics of the participants: a total of 724 women participated in the study, giving a response rate of 97.4%. The mean age of participants was 32.02 (SD ± 6.4) years. Of participants, 434 (60%) were Orthodox Christian followers, 696 (96.1%) had primary education and above, 162 (22.5%) were housewives, 565 (78%) were married and 159 (22%) cohabiting (Table 1).

HIV and sexual behavior of the participants: the mean duration of participants since start ART was 6 (SD ± 4.2) years. The prevalence of HIV disclosure status to partners was 518 (71.5%). Partners of 637 (88%) participants were tested for HIV, among those tested partners 583 (91.5%) were positive and 54 (8.5%) were negative. Of the participant, 645 (89.1%) had sexual activity during the past six months preceding the study period and 328 (45.3%) used condoms while they had sex. Of those who used condom, the majority 253 (77.1%) use it always and 98 (29.9%) used sometimes. Of the participants who did not use condoms their main reasons as did not want it 162 (55.1%), partners did not want 105 (28.5%) and need to have a child 105

(28.5%). Among condom users, the main reasons for using a condom were fear of other sexually transmitted infections 325 (99.1%), fear of re-infection with new HIV strain 227 (69.2%) and to prevent pregnancy 177 (54%).

Contraceptive counseling and utilization: of the participants, 336 (50.1%) desire for having children in the future. Out of the participants, 497 (68.6%) received counseling for sexuality, childbearing and modern contraceptives as part of the counseling in the ART unit and 326 (45%) used contraceptive methods. The most commonly used methods were condom 188 (57.6%), followed by pills 105 (32.2%), injectable 50 (15.3%) and implants 45 (13.8%). Utilization of intrauterine contraceptive device (IUCD) and female sterilization was 42 (12.8%) and 7 (2.1%), respectively. Of contraceptive method users, 126 (38.6%) used dual contraception and 131 (40.2%) choose to use the specific method because of its convenience.

Unmet need for modern contraceptives: of the participants, 398 (55%) did not use any form of contraceptive methods. Of which 34 (8.5%) were pregnant and 37 (9.3%) were postpartum amenorrheic at the time of the data collection. Of those women who were pregnant 17 (50%) were intended, 3 (8.8%) were unwanted/unintended and 14 (41.2%) were mistimed. out of postpartum amenorrheic women, 24 (64.9%) births were wanted, 7 (18.9%) were unwanted and 6 (16.2%) were mistimed. Of non-user participants, 268 (67.3%) were fecund. Out of fecund women 56 (20.9%) planned to have a child after two years, 86 (3.2%) do not want any more children while 126 (47%) want a child soon. Therefore, the total unmet need for modern contraceptives was 23.8% with 95% CI: (20.7, 26.9) (Figure 1).

Unmet need for spacing: of participants, pregnant women whose pregnancy were mistimed 14 (2%), postpartum amenorrheic women who did not use any form of modern contraceptives whose birth were mistimed 6 (0.8%) and neither pregnant nor amenorrheic women who plan to have another child after two years but did not use contraceptives were 56 (7.7%). The overall unmet need for spacing found to be 10.5%

Unmet need for limiting: of participants, pregnant women whose pregnancy was unwanted 3 (0.4%), postpartum amenorrheic women who did not use any form of modern contraceptives whose birth was unwanted 7 (1%), neither pregnant nor amenorrheic women want no more child but did not use contraceptives were 86 (11.9%). The overall unmet need for limiting found to be 13.3%.

Factors associated with unmet need of contraception: from binary logistic regression analysis age, current marital status, educational status, number of live children, monthly income, partner opposition, fear of method side effect, previous none-use of modern contraceptives, disclosure of HIV status for the partner, desire to have children in the future and did not getting counseling on modern contraceptives in ART unit had a p-value of <0.2. From multivariable logistic regression model, women of age between 15-24 years were 21.3 times (AOR=21.3, 95% CI: 8.69, 30.01) and age 25-34 years were 5.4 times (AOR=5.4, 95% CI: 3.08, 9.57) more likely to had an unmet need for modern contraceptives as compared to those age between 35-49 years old. Participants who had no formal education were 3.2 times (AOR=3.2, 95% CI: 1.06, 10.01) and had primary education were 2.2 times (AOR=2.2,95% CI: 1.14, 4.12) more likely to had an unmet need as compared to those who had a certificate and above educational level. Participants who had 1-2 children were 5 times (AOR=5.0, 95% CI: 2.32, 10.99) more likely to have an unmet need for modern contraceptives as compared with those who had no child. Participants who had no desire to have children in the future were 6.3 times (AOR=6.3: 95% CI: 3.82, 10.41) more likely to have an unmet need for modern contraceptive methods as compared to its counterpart.

Participants not counseled on sexuality, childbearing and modern contraceptives as part of the counseling in the ART unit were 2.1 times more likely to have an unmet need for modern

contraceptives (AOR=2.1, 95% CI: 1.39, 3.27) as compared with its counterpart. Women who did not use modern contraceptives previously were 1.7 times (AOR=1.7, 95% CI: 1.12, 2.68) more likely to had an unmet need as compared to those who had a history of contraceptive use. Those women had partner oppose to use contraception were 2.8 times more likely had unmet need (AOR=2.8, 95% CI: 1.73, 4.59) as compared to those who had no partner opposition. The odds of unmet need among women who had fear of method side effect were 3.2 times (AOR=3.2, 95% CI: 1.85, 5.64) more likely as compared to its counterparts (Table 2). The reasons for nonuse of a contraception method in those with unmet need for modern contraceptives during the study were: perceived low risk of pregnancy such as infrequent sex, not married and breastfeeding 46 (26.7%), have fear of side effects 40 (23.3%), did not get preferred method 30 (17.4%) and spouse were not willing to use contraceptives 56 (32.6%) (Figure 2).

Discussion

This study tried to assess the level of unmet need for modern contraceptives and associated factors among HIV-positive women who were on ART in selected public hospitals of Addis Ababa, Ethiopia. The prevalence of unmet need for modern contraceptive methods among HIV-positive reproductive-age women who were on ART was 23.8% with 95% CI (20.7, 26.9) of which 10.5% was an unmet need for spacing and 13.3% for limiting. This finding was comparable with the study done in Togo (23%) [16] and a study was done in Addis Ababa (25.1%) [11]. This might be due to the similarity of study participants' socio-demographic status. Our study finding is higher than the study done in Kenya 18% [17] and southern Ethiopia (19.1%) [18]. The possible explanation for the high unmet need for modern contraceptives in our study finding might be a difference in ART uptake status. In the current study, all participates had started HAART. Whereas, study participants in another study (southern Ethiopia) were either who started HAART or pre-HAART HIV patients. However, the present study finding is a lower rate than the study done in Nigeria (51.6%) [19] and Kumasi, Ghana (27.8%) [20]. The variation might be due to the difference in the study population and socio-demographic characteristics of the study participants. In this study women who are currently pregnant and postpartum amenorrhea were included. Whereas, other previous studies (Nigeria and Kumasi, Ghana) were not considered pregnant and postpartum women. Factors such as the age of women, educational status, number of live children, partner opposition, no previous use of modern contraceptive methods, no desire to have children in the future, fear of method side effects and did not getting counseling on modern contraceptives in ART unit were found to be determinants of unmet need for modern contraceptives.

This study found that the odds of unmet need for modern contraceptives was more than 21 times as likely in the age group 15-24 years and 5 times as likely in the age group 25-34 as compared to the age group 35-49 years old. This finding is supported by a study done in southern Ethiopia [14]. This could be because young women are less likely to be in a stable relationship and discuss modern contraceptives with their sexual partner and health care provider. The odds of unmet need for modern contraceptives were more than 3 times in participants who had no formal education and more than 2 times in those who had primary education as compared to those who had a certificate and above educational level. This finding is supported by a study done in Uganda [18] and Southern Ethiopia [21]. This might be due to those who are more educated might be in a better position to have better access to family planning methods and satisfy their contraceptive need and increase the level of knowledge on HIV and ways of transmission. The odds of unmet need for modern contraceptives were 5 times higher in those participants having 1-2 children as compared to no live child. This finding is supported by a study done in Nigeria on ART clients [22]. This might be due to couples with more children have a greater

desire to stop childbearing, which may not be translated into actual practice, because of other factors affecting the decision to use contraceptives. The findings of this study revealed that women with no desire to have children in the future had a higher unmet need as compared with those who have the desire. This differs from a study done in southern Ethiopia that showed that women with no desire to have a child had a less unmet need as compared with those who desire [18]. This might be due to women who have no desire to have a child not use modern contraceptives to stop childbearing because of other factors. This study found that HIV-positive women who had no previously using contraceptives had a high unmet need as compared to previously used ones. This in agreement with a study done in southern Ethiopia [21] and a study done in Nigeria [22]. This might be due to women previously used a method that was more likely to use in the future and as such will be less likely to have an unmet need for modern contraceptives.

This study showed that participants having partner oppose to use contraceptives was had an unmet need as compared with had no partner oppose. This is supported by a study done in Nigeria [19]. This indicates male involvement in FP issues will enhance contraceptive utilization and decrease unmet needs. The participants having fear of method side effect were had an unmet need as compared to who did not have fear of method side effect. This is supported by a study done in Addis Ababa [11]. It shows that the need for continuous counseling and discussion on modern contraceptive methods and the interaction with ART drugs. This study found that women who did not get counseling for sexuality, childbearing and modern contraceptives as part of the counseling in the ART unit were 2.1 times more likely to have an unmet need for modern contraceptives. This inline with a study done in Kumasi Ghana [20]. It shows that the need to integrate family planning and other reproductive health services with the ART service and also continuous counseling and health education about contraceptives will decrease the unmet need for modern contraceptives. Increased contact with health care providers could increase the chance of discussing modern contraceptive methods and utilization. We acknowledged the limitation of the study, as the study included more sensitive issues, social desirability bias could not be ruled out. Women may report a birth or current pregnancy as wanted once the child is born. This could result in an underestimation of the true extent of unwanted births and unmet needs.

Conclusion

In this study, the unmet need for modern contraceptives is found high among reproductive-age women who were on ART in public hospitals at Addis Ababa. Women age, educational status, number of a live child, no desire to have children in the future, partner opposition, previously none-use of modern contraceptives, fear of method side effect and did not get counseling for modern contraceptives in the ART unit are factors associated with unmet need for modern contraceptives. Attention should be given to women who are young, less educated, previously none use family planning and no desire more children. Activities that encourage male partner involvement in contraception programs need to focus to mitigate partner opposition to contraception. Besides, the setup of an ART clinic in a hospital needs to be evaluated for better patient access to contraception and possible integration of services to effectively implement HIV prevention activities. Needs strengthen counseling service and health education about HIV and modern contraceptives as part of ART care and treatment for all women in the ART units despite the marital status and other condition of women as every woman in the reproductive age group is potentially exposed to unintended pregnancy.

What is known about this topic

- *Contraception is the key primary strategy to prevent mother-to-child HIV transmission;*

- *Every year in the Ethiopia, 84,189 pregnancies occur among HIV-positive women and around 14,140 HIV-positive babies are born.*

What this study adds

- *This study added that the unmet need for modern contraceptives among reproductive-age women who were on ART is high when compared to another region of Ethiopia.*
- *In this study, the unmet need for modern contraception is high among women had partner oppose to use contraception and not get modern contraception counseling at ART clinic.*

Competing interests

The authors declare no competing interests.

Authors' contributions

All Authors significantly contributed to this study, their contribution is as follows: Tihun Tebekew Ashenefe conceived the study, developed the tool, coordinated the data collection activity, and carried out the statistical analysis. Yohannes Ayanaw Habitu, Destaw Fetene Teshome, Alehegn Bishaw Geremew, and Moges Muluneh Boke participated in the design of the study, development of the tool, and drafting of the manuscript. All authors read and approved the final manuscript.

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Tables and figures

Table 1: demographic and socio-economic characteristics of HIV-positive reproductive age women attending ART clinic in public hospitals Addis Ababa, Ethiopia, 2019

Table 2: factors associated with unmet need for modern contraceptives among HIV positive reproductive age women on ART in public hospitals in Addis Ababa, Ethiopia, 2019

Figure 1: components of unmet need for modern contraceptives among HIV positive reproductive-age women who were on ART, Addis Ababa, Ethiopia, 2019

Figure 2: reasons for nonuse of a contraception method in those with unmet need for modern contraceptive methods among HIV positive reproductive-age women who were on ART, Addis Ababa, Ethiopia, 2019

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Table 1: demographic and socio-economic characteristics of HIV-positive reproductive age women attending ART clinic in public hospitals Addis Ababa, Ethiopia, 2019			
Characteristics		**Frequency**	**Percent (%)**
Age	15-19	1	0.01
	20-24	73	10.1
	25-29	236	32.6
	30-34	164	22.7
	35-39	144	19.9
	40-44	74	10.2
	45-49	32	4.4
Marital status	Married	565	78
	Cohobating	159	22
Religion	Orthodox	434	59.9
	Muslim	164	22.7
	Protestant	85	11.7
	Catholic	30	4.1
	Other[1]	11	1.5
Educational status	No formal education	28	3.9
	Primary education	295	40.1
	Secondary education	254	35.1
	Certificate and above	147	20.3
Occupational status	House wife	162	22.4
	Government employee	176	24.3
	Merchant	141	19.5
	Nongovernmental employee	104	14.4
	Other[2]	141	19.5
Husband/partner educational status	No formal education	4	0.6
	Primary education	162	22.4
	Secondary education	250	34.5
	Certificate and above	279	38.5
Number of live children	No child	129	17.8
	1-2	473	65.3
	≥ 3	122	16.9
Estimated household income (Ethiopian Birr)	≤500	18	2.5
	501-1500	300	41.4
	1501-2500	275	38
	>2501	131	18.1
[1]No religion, seven day Adventist, [2]Daily laborers, students, self/private employ, unemployed			

Table 2: factors associated with unmet need for modern contraceptives among HIV positive reproductive age women on ART in public hospitals in Addis Ababa, Ethiopia, 2019					
Characteristics	**Unmet need**			**COR (95%CI)**	**AOR (95%CI)**
		Yes	No		
Age (years)	15-24	32	42	5.01 (2.78-9.00)*	21.28(8.69- 30.01)**
	25-34	107	293	2.40 (1.56-3.68)*	5.43 (3.08- 9.57)**
	35-49	33	217	1.00	1.00
Income	≤500	8	10	3.75 (1.34-10.55)*	1.60 (0.37- 6.80)
	501-1500	87	213	1.92 (1.15-3.21)*	1.90 (0.94-3.85)
	1501-2500	54	221	1.15 (0.67-1.97)*	1.46 (0.73-2.91)
	≥2501	23	108	1.00	1.00
Educational status	No formal education	12	16	3.66 (1.54-8.67) *	3.25 (1.06- 10.01) **
	Primary education	69	226	1.49 (0.89-2.47)*	2.17 (1.14- 4.12) **
	Secondary education	66	188	1.73 (1.02-2.86)*	1.32 (0.67-2.57)
	Certificate and above	25	122	1.00	1.00
Marital status	Cohabiting	49	110	1.60 (1.08 - 2.36) *	1.55 (0.96- 2.52)
	Currently married	123	442	1.00	1.00
Number of alive children	None	18	111	1.00	1.00
	1-2	134	339	2.44 (1.42- 4.17)*	5.05 (2.32-10.99)**
	≥3	20	102	1.21 (0.61-2.41)*	2.40 (0.89- 6.41)
6.31(3.82- 10.41)**	Yes	54	312	1.00	1.00
	No	118	240	2.84 (1.98- 4.08)*	
Disclosure of HIV status to partner	Yes	109	409	1.00	1.00
	No	63	143	1.65 (1.15-2.38)*	1.31 (0.67-1.89)
Previous use of modern methods	Yes	77	284	1.00	1.00
	No	95	268	2.84 (1.97-4.08)*	1.73 (1.12- 2.68)**
Counseling on modern contraceptives in ART unit	Counseled	98	399	1.00	1.00
	Not counseled	74	153	1.98 (1.38-2.81)*	2.13 (1.39-3.27)**
Partner oppose to contraceptives	Yes	56	93	2.38 (1.61-3.51)*	2.82 (1.73-4.59)**
	No	116	459	1.00	1.00
Having fear of method side effect	Yes	40	59	2.53 (1.62-3.95)*	3.23 (1.85 - 5.64) **
	No	132	493	1.00	1.00
Key: *p<0.2, **p<0.05, 1.00: reference, COR: crude odds ratio, AOR: adjusted odds ratio, CI: confidence interval					

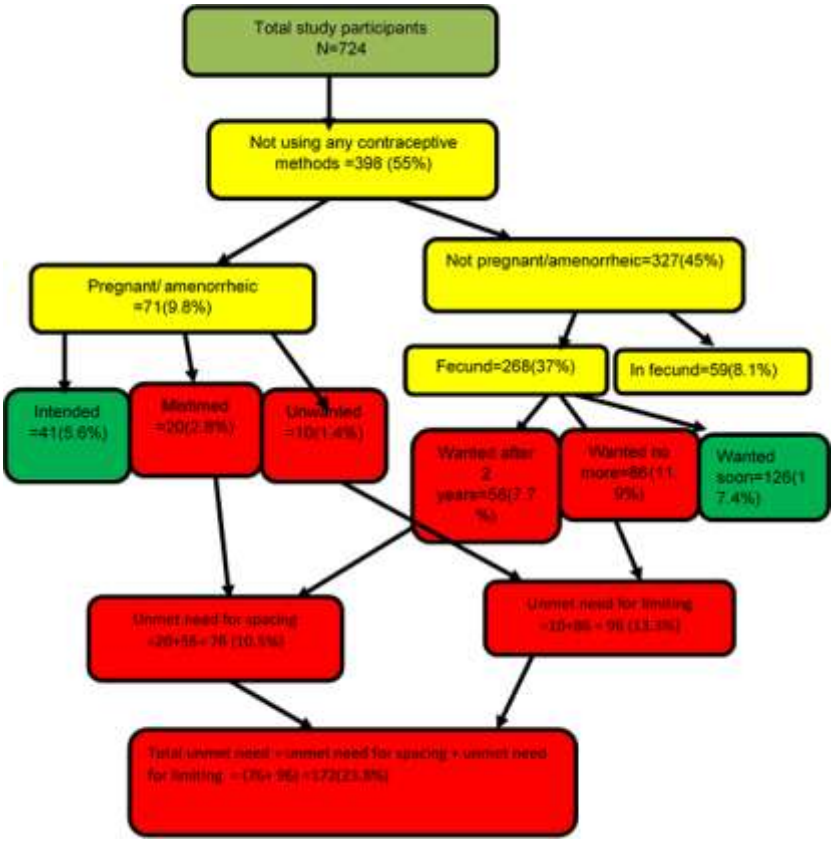

Figure 1: components of unmet need for modern contraceptives among HIV positive reproductive-age women who were on ART, Addis Ababa, Ethiopia, 2019

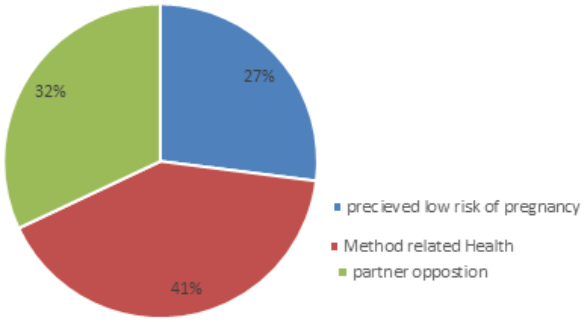

Figure 2: reasons for nonuse of a contraception method in those with unmet need for modern contraceptive methods among HIV positive reproductive-age women who were on ART, Addis Ababa, Ethiopia, 2019