

Knowledge and Utilization of Family Planning Methods Among People Living With Hiv In Kathmandu Valley

Anshu Bhoosal (✉ anshubhoosal@gmail.com)

Institute of Medicine

Namrata Karki

Department of Community Medicine, Institute of Medicine, Tribhuvan University

Riya Parajuli

Central Department of Public Health, Institute of Medicine, Tribhuvan University

Research article

Keywords: Knowledge, utilization, family planning, HIV, Kathmandu Valley, Nepal

Posted Date: May 19th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-29479/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Abstract

Background HIV is a major global health issue, targeting the immune system and making the body prone to diseases. People living with HIV mostly face societal stigma and fear of disclosure resulting in discrimination of accessing health facilities leading to multiple sex partners, increased sexual activity and less use of condoms. HIV positive women are at risk of transmitting HIV to their infants and their partners. Thus, the family planning services if provided to PLHIV can help to improve their and families health. In addition to, it reduces the risk of mother-to-child transmission (PMTCT). The facts related to PLHIV with respect to pregnancy and childbearing are not available. The purpose of this study is to focus on the status of the use of family planning methods and explore factors affecting the utilization among people living with HIV and AIDS in Kathmandu valley of Nepal. The study is expected to contribute in enhancing the present understanding of PLHIV towards family planning.

Methods The cross sectional descriptive method was used for the research. The study followed Population proportion to size method for the calculation of the respondents from four ART sites of Kathmandu Valley. Structured questionnaire used previously in similar research has been adopted with necessary question related to dual contraceptive use.

Results The mean age group of the respondents was (39.16 ± 6.969) years. More than two third respondents (69.5%) were Hindu. 34.8% respondents were married at the less than 20 years of age. Almost three- fourth of the PLHIV (74.4%) were literate where more than three fourth (79.3%) their spouses were literate and educated. About half of the respondents (43.9%) were found to be involved in professional/ technical/ managerial. More than half of the respondent's spouses (63.4%) were HIV positive. All the respondents (100%) respondents had disclosed their status to their partners. Neither the respondents nor their partner had fertility desire. 28% of neither respondents nor their partners had used the family planning methods before HIV diagnosis. More than half (60.4%) of the respondents had sexual intercourse prior to last 6 months. 15.9% of the respondents positively responded to use of dual protection. Only 11% either respondents or their partners had used the emergency contraceptive pill. 17.7% respondents did not use any family planning. This study revealed that almost half of the respondents (48.8%) had the good knowledge on the use of contraception.

Conclusion The use of dual protection is much less than the half of the respondents. Therefore, counseling and health education towards motivating PLHIV on using dual FP methods to avoid the risk of HIV, STIs and unplanned pregnancy is encouraged.

Background

According to the World Health Organization (WHO), the human immunodeficiency virus targets the immune system and weakens people's defense systems against infections and few types of cancer. As the virus destroys and impairs the function on immune cells, infected individuals gradually become immune deficient. The immunodeficiency leads to increase the susceptibility to a large range of infections, cancers and other diseases that individuals with healthy immune systems can fight off, resulting to the most advanced stage of HIV infection, acquired immunodeficiency syndrome (AIDS) (1). HIV and AIDS have spread to the majority countries within the world. However in recent years there has been utmost progress in HIV prevention and available of HIV Anti-Retroviral Therapy and thus decreased in deaths among people living with HIV (2).

HIV positive women are in danger of transmitting HIV to their infants and their partners. Thus, the family planning services if provided to PLHIV can help to enhance their and families health. In addition to, it reduces the risk of mother-to-child transmission (PMTCT). The World Health Organization (WHO) has recommended for the use of dual contraceptive methods by PLHIV (1). According to WHO, the ability of a woman to space and limit her pregnancies directly impact on her health and the wellbeing of the outcome of each pregnancy (3).

The women who don't have desire of kids, they also have the right to be informed about commonly available contraceptive methods. The facts related to pregnancy and childbearing of PLHIV is not available (4).

Study on the heard of family planning has been done in Nepal (5). There is few research on the knowledge and use of family planning methods among the PLHIV (4). Increased access to treatment for PLHIV, decrease in mortality among PLHIV took place with subsequent increase in functioning that includes sexual activity (6). In Nepal HIV/AIDS has developed to a concentrated epidemic among the key populations such as sex workers, IDUs, MSM and seasonal labor migrants. Newly diagnosed people living

with HIV were found to experience stigma and discrimination. Health personnel were somehow involved in stigmatizing and discriminating PLHIV. PLHIV mostly face societal stigma and fear of disclosure resulting in discrimination of accessing health facilities (7). The discrimination resulted to multiple sex partners, increased sexual activity and less use of condoms. The disclosure of HIV to partners increase the safe sex and use of condoms (8-11).

HIV has been the world's most serious public health challenges. HIV infection is preventable but as it affects not only the health of individuals, but also has an impact on all the social sectors and development. In long run, it leads to other infectious disease, affects the food security and results to serious problems. It decreases the workforce, worse the poverty, put enormous pressure on health and economy of the people. Global commitments have been made to prevent new cases of HIV in addition to ensure the proper access and utilization of HIV treatment (12, 13).

In the case of family planning choices, when one partner is HIV positive consideration of potential risk of transmitting to the uninfected partner as well as the possibility of infection and other STIs should be taken. Whereas, when both partners are HIV infected, the consideration of risk of re-infection should be taken (14).

HIV infection may affect the sexuality of people living with HIV. The reasons might be the fear of infecting the sexual partner, feelings of guilt, societal discrimination and stigma and reduced sexual desire (15). The discrimination resulted to multiple sex partners, increased sexual activity and less use of condoms. The disclosure of HIV to partners increase the safe sex and use of condoms (8-11, 15). However with the increment of antiretroviral treatment, improvement have in their sexual health and the desire of family in PLHIV (14). Family planning services is important for leading the healthy sexual life and health to prevent and treat HIV/AIDS. In addition to, avoiding unintended pregnancies is an important component to prevent HIV among infants. The correct and consistent use of condom has been found to be the most effective contraceptive method in protecting against HIV and other STIs (16). Nepal has prioritized the HIV and AIDS in the national policy and programs (2).

In the context of South East Asia Region (SEAR), the first case was identified in 1984. It's going to be four decades but HIV continues to spread in this region remaining a serious public health problem (17). In context of Nepal, the HIV prevalence among adult population is below 1%, whereas 31,020 people were estimated to be living with HIV by the 2017. Out of total estimated PLHIV 22,812 people are adults of age group (15-49 years). This makes 73.5% people of reproductive age are living with HIV (18). About 30% of people living with HIV were enrolled in treatment (19). Thus, the knowledge and utilization of family planning methods is of great importance to prevent the further transmission to other people.

In Anti-retroviral therapy, information of family planning methods and their importance to lead safe life is discussed. So, it is expected that the knowledge and utilization of the family planning methods of the PLHIV is quite good.

Nepal has prioritized the HIV and AIDS in the national policy and programs. As per national HIV /AIDS policy, a multi sectorial committee i.e. National AIDS Coordinating committee was established for the coordination, support and monitor the activities done for HIV/AIDS. The Government of Nepal has also implemented 3 rounds national HIV/AIDS strategic plan (20). The Government of Nepal is fully committed to fight HIV and AIDS, and aid in the noble cause of human development (19).

Testing booths were also set up in any places around Kathmandu Valley to encourage people to know their HIV status and receive required treatment (2, 20).

Very few research have been done in Asian countries compared to African nations related to the knowledge, needs and utilization of family planning methods in PLHIV (4). This study focuses on the status of the use of family planning methods and explore factors affecting the utilization among people living with HIV and AIDS in Kathmandu valley of Nepal. The study is expected to contribute in enhancing the present understanding of PLHIV towards family planning.

Methods

The general objective was to explore the knowledge of family planning methods and identify factors affecting the current utilization of such methods among HIV infected men and women attending ART sites of Kathmandu Valley.

Study method

Quantitative data was collected in the study.

Study design

The study design was descriptive and cross – sectional.

Study area

The study area were the ART of Kathmandu, Bhaktapur and Lalitpur districts, located in Province 3 of Nepal. The two ART of Kathmandu district i.e. Teaching Hospital and Sukraraj Tropical Infectious and Control Hospital, Sparsha Nepal of Lalitpur district and Bhaktapur Hospital of Bhaktapur district were the ART sites of the study. Kathmandu is the capital of Nepal and these ART sites provide services to majority of people living with HIV and AIDS.

Study population

People living with HIV/AIDS who were receiving the ART treatment and came to the site for refilling the medicines.

Sampling frame

The sampling frame was total PLHIVs registered at ART sites.

Sample size

The sample size was calculated by using formula:

$$n = \frac{z^2 pq}{d^2} \quad (\text{Cochran equation})$$

Where, n=Sample size

z= Reliability coefficient i.e. 1.96 at 95% confidence interval

p= Baseline prevalence of indicator

q= 1-p

d= Desirable or permissible error

Here, p= 0.72

d= Desirable error

$$\text{So, the sample size (n)} = \frac{(1.96)^2 * (0.72) * (0.28)}{(0.07)^2} = 158$$

For finite population,

Population size (N) = 2776

Sample size (n_o) = n/ (1+n/N)

= 149

Non response rate was 10% of 149 = 164

Total sample size was 164.

Using population proportion to size, no. of study population from each ART sites were estimated i.e.

- Sukraraj Tropical Infectious and Control Hospital = 116
- Sparsha Nepal= 22
- Teaching Hospital= 23
- Bhaktapur Hospital= 3

Data collection

Structured questionnaire used previously in similar research has been adopted. Informed consent was taken from the previous researcher⁴. The research instrument was pre tested prior to the study and necessary modifications was made in the questionnaire. Before its adoption, literatures review of related articles was done.

Coding was to simplify the data entry. Data was entered in EpiData 3.1 and analysis was carried out using Statistical Package for Social Sciences (SPSS) software version 21. Mean, median and standard deviation were calculated for the continuous variables. Frequency distribution and percentage were also calculated for the nominal and categorical variables.

By univariate analysis, the frequency distribution of dependent and independent variables were calculated. Similarly, the association between dependent and independent variables were calculated by using multivariate analysis.

Inclusion criteria

Married PLHIV's taking ART for at least 6 months were included in the study.

Exclusion criteria

People living with HIV who are below and above the reproductive age (15-49) years. Divorced and widow were excluded.

Results

The data analysis and results presented in this chapter are based on the 164 copies of the structured questionnaires that were asked in four ART sites of Kathmandu valley.

Descriptive Analysis

Socioeconomic and demographic characteristics of the respondents

The socioeconomic and demographic characteristics of the study population are shown on Table 1. About two third (64.6%) of the respondents were male and majority of the respondents were of age group (45-49). The mean age group of the respondents was (39.16 ± 6.969) years. More than two third respondents (69.5%) were Hindu. 34.8% respondents were married at the less than 20

years of age. Almost three-fourth of the PLHIV (74.4%) were literate whereas, more than three fourth (79.3%) their spouses were literate. About half of the respondents (43.9%) were found to be involved in professional/ technical/ managerial.

HIV infection related information of the respondents

Majority of the respondents (72.6%) were diagnosed in equal to or greater than 24 months. However, 69.5% had initiated their ART in equal to or greater than 24 months. More than half of the respondent's spouses (63.4%) were HIV positive. The disclosure of HIV to partners increases the safe sex and use of condoms. All the respondents (100%) respondents had disclosed their status to their partners.

Table 1
Frequency and percentage distribution of the demographic characteristics of the respondents (n=164)

Characteristics	Number	Percentage
Sex		
Male	106	64.6
Female	58	35.4
Age group (in years)		
25-29	20	12.2
30-34	25	15.2
35-39	23	14
40-44	47	28.7
45-49	49	29.9
Religion		
Hindu	114	69.5
Buddhist	28	17.1
Christian	18	11
Muslim	4	2.4
Age at marriage		
<20	57	34.8
20-24	45	27.4
25-29	37	22.6
30 and 30+	25	15.2
Respondents' education		

Table 2
HIV related information of the
respondents (n=164)

Characteristics	Number	Percentage
Time since HIV diagnosis		
Greater than or equal to 24 months	119	72.6
Less than 24 months	45	27.4
Time since use of ART		
Greater than or equal to 24 months	114	69.5
Less than 24 months	50	30.5
Spouses' HIV status		
Positive	104	63.4
Negative	60	36.6
Disclosure with spouse		
Yes	164	100

Reproductive history and fertility desire

More than half of the respondents (62.2%) had two children whereas about 1.2% of the respondents had 5 children. Use of any family planning methods before HIV diagnosis was 72%. In this question, the respondents could response to the use of family planning methods by their partners. Neither the respondents nor their partner had fertility desire. More than half (60.4%) of the respondents were sexually active in the last 6 months.

Table 3
Reproductive history, fertility desire and intention to initiate pregnancy (n=164)

Characteristics	Number	Percentage
Number of children		
0	15	9.1
1	27	16.5
2	102	62.2
3	11	6.7
4	7	4.3
5	2	1.2
Use of any FP before HIV diagnosis		
Yes	118	72
No	46	28
Fertility Desire		
No	164	100
Sexual intercourse in last 6 months		
Yes	99	60.4
No	65	39.6

Knowledge on family planning methods

For the understanding of the knowledge of the respondents on the family planning methods, multiple responses question was used. It included the questions if the respondents had heard of any listed seven family planning methods and if yes, they were further asked the duration of those family planning methods. The knowledge score is calculated by comparing with the mean score. If the knowledge score was equal to more than the average score, it reflected the respondent had good knowledge. But, if the score was below average, the knowledge was poor.

The knowledge level of majority of the respondents (51.2%) was below average i.e. poor.

Utilization of family planning methods

The use of any family planning method includes the use either by the respondents or their partner. The male respondents could answer the family planning methods used by their partner and vice versa. 82.3% of either respondents or their partner use the family planning method.

Table 4
Utilization of family planning methods by either partners
(Multiple Responses**)

Characteristics	Number	Percentage
Yes	135	82.3
No	29	17.7

In addition to, the respondents were asked if they or their partner used any family planning methods before the diagnosis of their HIV status. The utilization of family planning methods increased to 82.3% from 72% after the diagnosis of their HIV status.

In Table 5, the comparison of the family planning methods used either by the respondents or their partner. It shows that, the use of condom, male sterilization, oral contraceptive and implant has been increased. Before the diagnosis, none of the used female sterilization. However, after the diagnosis its use increased to 15.4%. Similarly, 4.9% of the male used withdrawal method which reduced to zero after the diagnosis. In addition to, the use of copper T decreased to 0 after the diagnosis.

Table 5
Comparative use of specific family planning methods before and after the diagnosis (Multiple responses**)

Characteristics	Before diagnosis	After diagnosis
	Number (Percentage)	Number (Percentage)
Utilization of FP methods		
Condom	76 (46.4)	108 (129.2)
Male sterilization	4 (3.6)	20 (16.7)
Oral Contraceptive	12 (7.3)	6 (8.5)
Depo provera	33 (20.1)	11 (8.4)
Implant	2 (1.2)	4 (2.8)

As shown in figure 5, 11% of either respondents or their partner had used the emergency contraceptive pill.

Figure 5: Pie chart representing the use of emergency contraceptive pill

The respondents were also asked about the use of dual method of contraception or dual protection. 15.9% of the respondents positively responded to its use.

Figure 6: Pie chart representing the use of dual method of contraception

Perceived reasons for not using family planning methods

17.7% of neither the respondents nor their partner used any family planning methods. Among them, the most common reason was both being infected (9.1%). Other reasons were: lack of sexual desire (6.1%) and husband's disapproval (2.4%).

Findings from bivariate analysis

This section includes the bivariate analysis of different study variables with the outcome variable. The study variables are socio-demographic variables, HIV related information, reproductive fertility and fertility desire. The outcome variable is knowledge and current utilization of family planning methods. The association was assessed at 95 percent confidence interval.

Association between socio-economic and demographic variables with the current utilization of family planning methods

In the bivariate analysis association of the socio economic and demographic variables were assessed with the utilization of family planning methods. Sex of the respondents was found to be significantly associated with the utilization of family planning

methods.

Table 6
Association between sex of the respondents and the current utilization of family planning

Sex	Current utilization of FP methods		χ^2 value	p-value
	Yes	No		
Male	92	14	4.124	0.042*
Female	43	15		

*means p- value <0.05 (i.e. statistically significance)

Ethnicity, age of the respondents, age at marriage, respondents' education, spouses' education and occupation of the respondents were not found to be significantly associated with the current utilization of family planning methods.

Table 7
Association between socio-economic and demographic variables with the utilization of family planning methods

Characteristics	Current Utilization of FP methods		χ^2 value	p-value
	Yes	No		
Ethnicity				
Hindu	95	19	0.265	0.606
Non- hindu	40	10		
Age of the respondents				
25-36	39	11	0.921	0.337
37-49	96	18		
Age at marriage				
Less than 20	61	17	1.728	0.189
20 and above	74	12		
Respondent's education				
Literate	100	22	0.040	0.841
Illiterate	35	7		
Spouse's education				
Literate	106	24	0.261	0.609
Illiterate	29	5		
Occupation				
Professional	61	11	0.524	0.769
Agriculture	40	10		
Others	34	8		

(Others: Clerical, skilled manual and skilled manual)

Association between HIV related information with the current utilization of family planning methods

Time since HIV diagnosis was found not to be significantly associated with the current utilization of FP methods. However, spouse's HIV status was found to be significantly associated.

Table 8
Association between HIV related information and utilization of family planning methods

Characteristics	Current utilization of FP methods		χ^2 value	p-value
	Yes	No		
Time since HIV diagnosis				
Less than 24 months	24	39	0.806	0.369
24 months or above	96	23		
Spouse's HIV status				
Positive	79	25	7.888	0.005*
Negative	56	4		

*means p- value <0.05 (i.e. statistically significance)

Association between knowledge level and the current utilization of family planning methods

The knowledge level of the respondents on family planning was not statistically significant with the current utilization of family planning methods.

Table 9
Association between knowledge level and the current utilization of family planning methods

Knowledge level	Current utilization of FP methods		χ^2 value	p value
	Yes	No		
Below average	67	12	0.772	0.379
Average & above	68	12		

Association between use of emergency contraceptive pill and the current utilization of family planning methods

There was no any statistical significance between the use of emergency contraceptive pill and the usage of family planning methods.

Table 10
Association between use of emergency contraceptive pill and the current utilization of family planning methods

Use of emergency contraceptive pill	Current utilization of FP methods		χ^2 value	p- value
	Yes	No		
Yes	16	2	0.600	0.439
No	119	27		

Discussion

This study was an institutional based to identify the knowledge and utilization of family planning methods by the people living with HIV. Its purpose was also to explore the factors affecting the utilization of the family planning methods. The study was conducted in four ART sites of Kathmandu Valley. The study was quantitative.

Socio-economic and demographic variables

In this study, sex of the respondents was statistically significant in association with the utilization of family planning whereas, other socio economic variables such as ethnicity, age of the respondents, age at marriage, respondents' education, spouses' education and occupation were not associated. In a similar study done in Kathmandu district, the respondents' sex was significant with the use of family planning. In contrast, the study conducted in the Kathmandu district, Northern Uganda, Southern Uganda, Swaziland and Northern Ethiopia respondents' education was significantly associated with the use of contraception (4, 21-24).

HIV related information

The respondents whose spouses were HIV positive were more likely to use the family planning methods than whose spouses were HIV negative. Similar finding was found in the study done in Kathmandu district (4). Only 50% of the respondents had disclosed their HIV status with their sexual partner. Disclosure of HIV status has been empowering experience to both male and female (15).

Reproductive history and fertility desire

The mean number of children for the respondents found to be 1.82(\pm 0.933) whereas in the study done in Kathmandu district the mean was 1.96 (\pm 0.06) (4).

In this study, the fertility desire found to be nil. Whereas in the similar study in Kathmandu district 20% of the respondents had desire to have children. In addition to, it was not statistically significant in association with the utilization of family planning methods (4). In Sub-Saharan Africa and Asia, culture plays an important role in the fertility desire (25). In context of Nepal too, the child bearing is the ultimate goal of marriage but the HIV status have negative impact on it (4). During the interview the majority of the respondents responded that they did not want their child to suffer because of them. A study done in India found that the respondents being HIV positive was statistically significant in association with the limiting fertility desire (26). This might be true in this study.

Knowledge on family planning methods

This study revealed that almost half of the respondents (48.8%) had the good knowledge on the use of contraception. In Cameroon, the knowledge of the women was taken into account which was 98%. In Northern Uganda (96%) and Cameroon, there was high level of knowledge (9, 21). However, in Nigeria only 7% had the good knowledge of family planning methods (27).

Utilization of the family planning methods

In this section, the answers from the respondents and their partner was included. The percentage of utilizing it is more than that of the results published from the study of Kathmandu (72%) and Kaski districts (70%) of Nepal (4, 5). The increase in the use of contraception might be the tremendous use of condom.

A mixed method study done in Northern Uganda reported that 96 percent people living with HIV had knowledge about family planning methods. But only, 38 percent were currently using any method (21). Similar kind of study was done among HIV positive women of age (15-49) years of Cameroon region (2013) which resulted 98% knew at least one method of contraception (27). Interestingly in South West Nigeria, people living with HIV had poor knowledge (7 percent) and very low current use of contraception (29.9 percent) (27).

The trend of the use of contraceptive before and after HIV diagnosis suggest tremendous increase in the use of condom compared to non-condom contraceptives. This finding is supported by the research done in the Kathmandu district of Nepal, Iran, Swaziland, India and Uganda (4, 22, 23, 28, 29). According to the mixed method study done on Iran the people living with HIV were not willing to use other than condom because of the recommendation made by the health care providers as the main method of contraception (28).

This research resulted that the HIV status of spouses is statistically significant with the utilization of family planning methods. This has been emphasized by a national guideline of Ethiopia (31). Only 11 % of either the respondents or their partner had used the emergency contraceptive pill whereas, in Thailand as per the cohort study 29.6% had used the dual protection (30). In the similar study done in Kaski district of Nepal, 0.83% had used it (5).

The prevalence of condom use was increased from 13% to 92% compared to before and after HIV diagnosis respectively in Kathmandu district (4). Similarly, the use of condoms increased from 35% to 81% after being diagnosed with HIV in three cities of India (26).

Perceived reasons for not using family planning methods

The most common perceived reason for not using any methods of family planning was both the partners being infected with HIV. Other reasons were: lack of sexual desire and husband's disapproval. This indicates the need of sufficient counselling and awareness to the PLHIV. A similar study done in Kaski resulted the significant association between counselling sessions on family planning and the use of them (5). However according to the studies done in Ghana and Uganda misinformation, fear of side effects, negative perceptions, health concerns, reduction in pleasure were identified as the reason for non-utilization of the family planning (32, 33).

Recall bias was the limitation. Since the questionnaire included the family planning methods, the respondents were hesitate to specify the family planning methods they have heard / used.

Conclusion

This study was conducted focusing on the status of the use of family planning methods and explore factors affecting the utilization among people living with HIV and AIDS in Kathmandu valley of Nepal.

Considerable high proportion of adults of reproductive age fall under PLHIV. Sex of the respondents and spouses' HIV status were significantly associated with the utilization of family planning. While, ethnicity, age of the respondents, age at marriage, respondents' education, spouses' education and occupation of the respondents were not found to be significantly associated with the current utilization of family planning methods. Similarly, knowledge level of family planning methods was not found to be significantly associated with the current utilization of family planning methods. The disclosure of the HIV status to the partner increased the safe sex and use of condom.

Abbreviations

AIDS Acquired Immune Deficiency Syndromes

ART Antiretroviral Therapy

CI Confidence Interval

DoHS Department of Health Services

HIV Human Immune Deficiency Virus

HMIS Health Management Information System

IDU Injecting Drug User

MSM Men who have sex with men

NACC National AIDS Coordination Committee

NDHS Nepal Demographic and Health Survey

PLHIV People Living with HIV/AIDS

PMTCT Prevention of Mother-To-Child Transmission

SEAR South East Asia Region

SDG Sustainable Development Goal

SPSS Statistical Package for Social Sciences

WHO World Health Organization

Declarations

Ethics approval and consent to participate

Ethical approval was taken from Institutional Review Committee of Institute of Medicine (IoM). Written permission was taken from the ART sites where study was conducted.

Consent for publication

Not applicable

Availability of data and materials

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

Competing interests

The authors declare that they have no competing interests.

Funding

No funding was obtained in order to conduct the study.

Authors' contributions

AB designed the concept, performed data collection, did data analysis and prepared the manuscript for submission. RP assisted in data collection and its analysis. NK approved the concept, provided overall supervision on the appropriateness of methods, assisted with the data analysis, and reviewed the manuscript for critical issues.

Acknowledgements

We would like to extend my sincere gratitude to the faculties and staffs of Central Department of Public Health and Department of Community Medicine of Institute of Medicine. We would like to acknowledge Saurav Tamrakar for his assistance in data collection. In addition to, we are grateful to all the administration offices of all four ART sites for granting the permission to conduct our research. We are highly indebted to all the ART in-charges and staffs of all four ART sites for their support and cooperation for letting us to conduct our data collection in their institution. We would like to extend the most sincere gratitude to all those respondents who agreed to provide us the consent to respond to the questionnaire.

References

1. HIV [Internet]. World Health Organization. 2019 [cited 20 August 2019]. Available from: <https://www.who.int/hiv/en/>.
2. National Centre for AIDS and STD Control (NCASC) URL. http://www.ncasc.gov.np/index1.php?option=YnvuhyOVnuqVPWQ4vf7Jrmfb6GgaBOWesXQtjB7REWs&id=CS6xyYyWqJh_02g9z7yLXMITYneqWcMAruaHzYiBnQA.
3. WHO. | The ABC's of family planning.
4. <https://>.
5. Pokharel R, Bhattarai G, Shrestha N, Onta S. Knowledge and utilization of family planning methods among people living with HIV in Kathmandu, Nepal. *BMC Health Serv Res*. 2018;18(1):836. doi:10.1186/s12913-018-3643-3. Published 2018 Nov 6.
6. Mishra SR, Joshi MP, Khanal V. (2014) Family Planning Knowledge and Practice among People Living with HIV in Nepal. *PLoS ONE* 9(2): e88663. doi:10.1371/journal.pone.0088663.
7. Global HIV. & AIDS statistics- 2019 fact sheet.
8. Pearson CR, Cassels S, Kurth AE, Montoya P, Micek MA, Gloyd SS. Change in sexual activity 12 months after ART initiation among HIV-positive Mozambicans. *AIDS and Behavior*. 2011 May 1;15(4):778 – 87.
9. Family Planning Association of Nepal (FPAN). the people living with HIV stigma index 2011. kathmandu: FPAN; 2011. 93–6 p.
10. Dia A, Marcellin F, Bonono RC, Boyer S, Bouhnik AD, et al. Prevalence of unsafe sex with one's steady partner either HIV-negative or of unknown HIV status and associated determinants in Cameroon (EVAL ANRS12–116 survey). *Sex Transm Infect*. 2010;86:148–54.
11. Kalichman SC, Ntseane D, Nthomang K, Segwabe M, Phorano O, et al. Recent multiple sexual partners and HIV transmission risks among people living with HIV/AIDS in Botswana. *Sex Transm Infect*. 2007;83:371–5.
12. Loubiere S, Peretti-Watel P, Boyer S, Blanche J, Abega SC, et al. HIV disclosure and unsafe sex among HIV-infected women in Cameroon: results from the ANRS-EVAL study. *Soc Sci Med*. 2009;69:885–91.
13. Global Statistics [Internet]. HIV.gov. 2019 [cited 30 November 2019]. Available from: <https://www.hiv.gov/hiv-basics/overview/data-and-trends/global-statistics>.
14. HIV | Healthy People. 2020 [Internet]. [healthypeople.gov](https://www.healthypeople.gov/2020/topics-objectives/topic/hiv). 2019 [cited 30 November 2019]. Available from: <https://www.healthypeople.gov/2020/topics-objectives/topic/hiv>.
15. Delvaux T, Nöstlinger C. Reproductive Choice for Women and Men Living with HIV: Contraception, Abortion and Fertility. *Reproductive Health Matters*. 2007;15(sup29):46–66.
16. The People Living with HIV stigma Index Nepal. 2011. Family Planning Association of Nepal (2011).
17. World Health Organization. Sexual and reproductive health of women living with HIV/AIDS: guidelines on care, treatment and support for women living with HIV/AIDS and their children in resource-constrained settings. [Internet]. [Who.int](https://www.who.int/hiv/pub/guidelines/sexualreproductivehealth.pdf). 2019 [cited 20 October 2019]. Available from: <https://www.who.int/hiv/pub/guidelines/sexualreproductivehealth.pdf>.
18. World Health Organization. Antiretroviral therapy (ART) coverage among all age groups. Global Health Observatory (GHO) data. 2016.

19. Factsheet-2018-final.pdf.
20. National HIVSPlan 2016–2021 | Nepal HIVision 2020: Fast-Track ending the AIDS epidemic as a public health threat, by 2030 (2nd Edition, June 2017) [EN/NE] - Nepal [Internet]. ReliefWeb. 2019 [cited 19 December 2019]. Available from: <https://reliefweb.int/report/nepal/national-hiv-strategic-plan-2016-2021-nepal-hivision-2020-fast-track-ending-aids>.
21. HIV/AIDS and STI [Internet]. Dohs.gov.np. 2019 [cited 2 September 2019]. Available from: <https://dohs.gov.np/centers/ncasc/hivaids-and-sti/>.
22. Nattabi B, Li J, Thompson S, Orach C, Earnest J. Family planning among people living with HIV in post-conflict Northern Uganda: A mixed methods study. *Conflict and Health*. 2011;5(1).
23. Muyindike W, Fatch R, Steinfield R, Matthews LT, Musinguzi N, Emenyonu NI, et al. Contraceptive use and associated factors among women enrolling into HIV Care in Southwestern Uganda. *Infect Dis Obstet Gynecol*. 2012; 1–9.
24. Warren CE, Abuya T, Askew I. Family planning practices and pregnancy intentions among HIV-positive and HIV-negative postpartum women in Swaziland: a cross sectional survey. *BMC Pregnancy Childbirth*. 2013;13:150.
25. Melaku YA, Zeleke EG, Gregson S, Bracken H, Zweigenthal V. Contraceptive Utilization and Associated Factors among HIV Positive Women on Chronic Follow Up Care in Tigray Region, Northern Ethiopia: A Cross Sectional Study. *PLoS One*. 2014; 9:e94682 Vall M, editor.
26. Myer L, Morroni C, Rebe K. Prevalence and determinants of fertility intentions of HIV-infected women and men receiving antiretroviral therapy in South Africa. *AIDS Patient Care STDs*. 2007;21(4):278–85.
27. Chakrapani V, Kershaw T, Shunmugam M, Newman PA, Cornman DH, Dubrow R. Prevalence of and barriers to dual-contraceptive methods use among married men and women living with HIV in India. *Infect Dis Obstet Gynecol*. 2011; 2011:1–8.
28. Ajao KO, Osho PO, Koledoye V, Fagbemi SO, Oluwatoyosi DO. Factors influencing condom use among people living with HIV/AIDS attending clinics at state specialist hospital, Akure, Ondo State, Nigeria. *Gynecol Obstet (Sunnyvale)*. 2014;4:254.
29. Nedjat S, Moazen B, Rezaei F, Hajizadeh S, Majdzadeh R, Setayesh HR, et al. Sexual and reproductive health needs of HIV-positive people in Tehran, Iran: a mixed-method descriptive study. *Int J Heal policy Manag*. 2015;4:591–8.
30. Chakrapani V, Kershaw T, Shunmugam M, Newman PA, Cornman DH, Dubrow R. Prevalence of and barriers to dual-contraceptive methods use among married men and women living with HIV in India. *Infect Dis Obstet Gynecol*. 2011; 2011:1–8.
31. Munsakul W, Lolekha R, Kowadisaiburana B. Dual contraceptive method use and pregnancy intention among people living with HIV receiving HIV care at six hospitals in Thailand. *Reprod*.
32. Federal Ministry of Health Ethiopia (FMoH). Antiretroviral Therapy Guidelines for Adult Patients in Ethiopia. 2nd edition. Addis Ababa, Ethiopia: 2008.
33. Apanga PA, Adam MA. Factors influencing the uptake of family planning services in the Talensi District, Ghana. *Pan Afr Med J*. 2015;20:10.
34. Worke MD, Bezabih LM, Woldetasdik MA. Utilization of contraception among sexually active HIV positive women attending art clinic in University of Gondar Hospital: a hospital based cross-sectional study. *BMC Womens Health*. 2016;16:67.