Factors Influencing Women's Choice for Place of Child Birth in Rural Ethiopia: *A Cross-Sectional Study*

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Summary

BACKGROUND

Pregnancy and childbirth complications are foremost cause of deaths and incapacity among women of the reproductive age in developing countries. In Ethiopia, nearly a third to a fourth of births occur without the help of a trained birth assistant.

OBJECTIVES

The aim of this study was to assess the prevalence of institutional delivery and the determinants for choice of place of delivery.

METHODOLOGY

A cross-sectional study design was employed from June to August 2018 and systematic sampling method used to select eligible respondents. From a total number of 5,398 pregnant women of whom 85% had visted ANC facilities, thestudy recruited 402 mothers aged 25-34 years. These mothers had given birth one year prior to data collection in the Wondo Genet District of Ethiopia. Data was cleansed, coded, entered into *Epi Data 3.1* and analyzed using *SPSS version 20*. Logistic regression was used to identify statistically significant variables for the choice of place for delivery.

RESULTS

More than half 216 (53.7%) of the respondents were rural residents and more than one-third 147 (36.6%) were not able to read nor write. From every 10 women, 4 were housewives thus 249 (61.9%). More than 75% of them had access to the media (majorly television and radio) Factors that were statistically significant for the choice place of delivery were primary and above educational status of women, (AOR=0.14, CI, 0.03-0.68), income greater than 3000 ETB (AOR=8.35 CI, 3.6-19.4), four or more ANC frequency (AOR=4.14 CI, 2.0-8.6) and previous planned pregnancy (AOR=4.14 CI, 2.0- 8.6).

CONCLUSION

Prevalence of institutional delivery was 61.2%. This calls for the District Health Committee to work on myth and misconception surrounding institutional delivery. Appropriate information, education, and communication will be a vital strategy in helping women to take the initiative of visiting health facilities. Educational status and monthly income were statistically important factors in disseminating health information to enhance knowledge of the women.

Keywords **-** institutional delivery, place of childbirth, home delivery, maternal health, Health facility.

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Introduction

Globally, approximately 800 women die from pregnancy or childbirth-related complications daily. Almost 99% of these maternal deaths occurred in the low-resource setting areas. Specifically Sub-Saharan Africa and South Asia contributing approximately 88% of maternal deaths previously [1].

Out of the ten countries which contributed 58% of the global maternal deaths reported in 2013, Ethiopia contributed 4% [2]. All Millennium development goal (MDG) regions of the world have experienced considerable reductions in maternal mortality even though it varies considerably [3].

Ethiopia was categorized as having very low utilization of health facilities by pregnant mothers for childbirth compared to Kenya, Tanzania, and Uganda [4]. For all pregnant women, utilization of maternal health care services is a key proximate determinant of maternal and newborn outcomes with emphasize on maternal and infant morbidity and mortality [5].

Despite the fact that skilled delivery being one of the most important maternal health indicators, in Ethiopia, majority of births occurred without the help of a skilled assistant and mainly at home. Home deliveries tend to be unhygienic, unsupervised, associated with adverse infant, maternal disadvantages and usually too late for intervention. Nevertheless, there had been a significant advancement in the past 15 years in which the number of deliveries at a health facility started increasing, from 10% in 2000 to 26 % births as reported in 2016 [6].

Most studies agree that, women with above primary level of education, women who were in the richest quintile being residents of urban areas, residing within walking distance from health facilities were important predictors for others to practice facility-based childbirth [1,6, 14-15, 17 22].

With regard to the obstetric history of the respondents, nulliparous women practice institutional delivery compared with multiparous women [16]. Having antenatal care (ANC) follow up during pregnancy and higher frequency of ANC visits [18-19,24] was a significant variable to encourage women to give birth in health facilities. Family Planning pregnancy was also an important determinant for choosing institutional delivery [19].

The most typical reasons given by respondents who practice out of facility childbirth were, traditional beliefs, facility delivery is not necessary, religious practice during childbirth, previous safe home births, preferred delivering naturally and traditional birth attendants (TBAs) are readily available [10-14, 20 - 22].

Therefore, the aim of this study was to assess the prevalence of institutional delivery and the determinants for the choice of place of delivery. Overall, the findings of this study will have important implications for health care planning, resource allocation, and policy planning mainly pertinent to the study area in the spectrum of health care system strength, support and development that hasten achievement of sustainable development goals (SDGs) particularly SDG 4 and 5 which are to ensure inclusive, equitable quality education, promote life-long learning opportunities for all, achieve gender equality and empower all women and girls respectively.

Methodology

Study Area and Population

Wondo Genet District is found in Sidama Zone, Southern Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia. Wondo Genet District is 275 km far from the capital city of Ethiopia, Addis Ababa. The district is bordered on the south by Malga, on the west by Hawassa Zuria, on the north and east by the Oromia Region.

The district had five Health Centers and 16 health posts. The total population was 156,017 with 76,760 males and 79,257 females. The total number of women in reproductive age in the district was 27,334 and number of pregnant women was 5,398. Out of this 85% of women had at least one ANC follow up. The source population of the study was all mothers who gave birth 12 months prior to the study in the district.

This study population was all mothers who had given birth 12 months prior to the study and those visiting ANC facilities during the time of data collection in Wondo Genet District.

Study Design and Sample Size Determination

The institution-based cross-sectional study design was employed to assess the determinants for

the choice for place of delivery among mothers and to determine the prevalence of institutional delivery. The study period was from June to August 2018.

A single population proportion formula (EPI info 3.5.1) was used to estimate the sample size required for the study. The following assumptions were made to estimate sample size using 38% prevalence of institutional delivery from the previous study and 95% confidence interval, 5% precision, and a 10% non-response rate. Therefore considering 10% non-response rate final sample size was 402 [7].

The simple random sampling method was used to select eligible mothers for the study. Proportional allocation of the sample was employed for each health centers to ensure representation of the source population.

Data Collection Tools

The standard and structured questionnaire was used for data collection. Data was collected through interview - administered questionnaires. The questionnaire was prepared in English and then translated by language experts into Amharic, again back-translated into English to check for consistency of meaning.

The main components of the questionnaire were socio-demographic characteristics, ANC and pregnancy outcome, maternal service-related, and the reason for choosing home delivery. The pre-test was conducted in Yirgalem town on 5% (20 mothers) of the sample size and adjustment was made accordingly.

Data was collected by 10 trained data collectors, who were first degree holders in health sciences with previous experience in data collection. For all of the data collectors, to ensure the quality of the data, one-day training was given. Inspection for completeness of questionnaires was carried out.

Data management and analysis

Data was cleansed, coded and entered into ***Epi data version 3.02*** and analyzed using ***SPSS version 20*** for descriptive and inferential statistics. To explain the study population in relation to relevant variables, descriptive statistics like frequency distribution table and summary measures were computed.

To identify statistically significant variables for the choice of place of delivery, a bivariate analysis was made for each independent variable to outcome variable separately. Those variables with p-value < 0.3 in bivariate analysis were imported to multiple logistic regressions. In multiple logistic regressions those variables with a p-value <0.05 considered as statistically significant variables for the choice of place of delivery and presented with 95%CI and AOR.

To explain the above paragraph, a statistical model specified by Hosmer and Lemeshow- goodness of fit was assumed:

$$ln\left[\frac{P}{1-P}\right] = a + \sum_{n=1}^{n} \beta_i X_i$$

Whereby P is a probability of delivering an institution in most recent birth, α and β are estimated regression coefficients and X*i* are various explanatory variables. Odds Ratio (OR) i.e., Exp(β) for each category of explanatory variables were also estimated along with their 95% Confidence Intervals (CI) and the effect of a category on the likelihood for delivery in a health facility was considered significant (p<0.05) when estimated CI does not contain 1.

Results

Socio-Demographic Characteristics

A total of four hundred and two (402) women who gave birth one year prior to the survey were included in the study. More than half, 246 (61.2%) of the women were in the age group of 25-34 and one-third, 133 (33.1%) of them were in the age group of 18-24.

The mean age of the participants was 25.87 (SD±4.34). Nearly one-third 31.3% (126) of the women had 2 children. There were 281 (69.9%) women of Sidama ethnic group and the majority 319(79.4%) of women were of the Protestant religion. The median monthly income of the respondents was 3000 ETB with (IQR 1500-5000 ETB) (which is nearly equal to the 128.73US dollar).

More than half 216 (53.7%) of the respondents were rural residents and also more than one-third of women 147 (36.6%) were not able to read and write. From every 10 women, four were housewives 249 (61.9%). More than 75% of women had access to media (majorly television and radio). ***(Table 1) next page.***

Table-1: Socio-Demographic Characteristics of Women in Wondo Genet District, Ethiopia 2018 (n= 402).

Variables	Categories	Frequency (%)
Age groups	18-24	133 (33.1)
	25-34	246 (61.2)
	>35	23 (5.7)
Place of residence	Rural	216 (53.7)
	Urban	186 (46.3)
Marital status	Married	398 (99)
	Divorce	2 (0.5)
	Widowed	2 (0.50
Religion	Protestant	319 (79.4)
	Orthodox	49 (12.2)
	Muslim	33 (8.2)
	Others*	1(0.2)
Ethnicity	Sidama	281(69.9)
	Wolaita	17(4.2)
	Amhara	37(9.2)
	Gurage	27 (6.7)
	Oromo	34(8.5)
	Others *	6(1.5)
Educational status of women	No formal education	147(36.6)
	Primary education	191(47.5)
	Secondary and above	64(15.9)
Educational status of husband	No formal education	79(19.7)
	Primary education	225(56)
	Secondary and above	98(24.4)

(*Religion other = Catholic, *Ethnicity other = Kenbata and Hadiya)

Table-1: Socio-Demographic Characteristics of Women in Wondo Genet District, Ethiopia 2018 (n= 402)

Variables	Categories	Frequency (%)
Occupation status of women	Housewife	249(61.9)
	Farmer	90(22.4)
	Government employee	63(15.7)
Occupation status of husband	Farmer	178(44.3)
	Government employee	61(15.2)
	Merchant	163(40.5)
Access to media	Yes	304(75.6)
	No	98(24.6)

(*Religion other=Catholic, *Ethnicity other= Kenbata and Hadiya)

Magnitude of Women Place of Childbirth

Out of the total 402 women who participated in the study, 246 (61.2%) of them, had given birth in a health institution whereas 156 gave birth at home ***(Figure 1).***

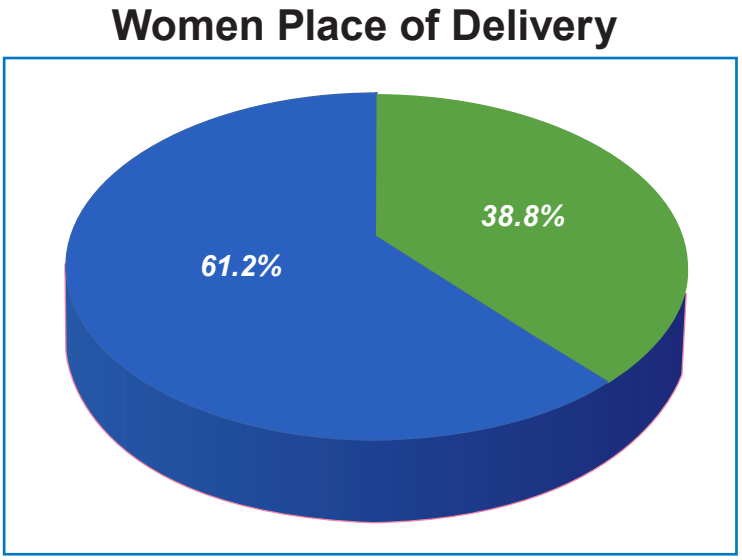

Figure 1: *Women's Place of Childbirth in Wondo Genet District, Ethiopia, 2018*

Women's Reasons for Delivering at Home

The major women's reasons for home delivery were the experience of sudden onset of labor and customary to deliver at home or unnecessary to deliver in health facility accounted for 88 and 74 (n=156) respectively ***(Table 2).***

Table 2 : Distribution of Women's Reason to Give Birth out of Health Institution in Wondo Genet District, Ethiopia 2018 (N=156)

Reasons	Frequency	Percentage (%)
Sudden onset of labor	88	56.40%
Unnecessary to deliver in a health facility	74	47.40%
Previous safe home birth	53	34.00%
Family or husband do not allow	49	31.40%
Too far or no transportation	48	30.80%
The absence of a female health worker	46	29.50%
Too much cost to deliver in the health facility	2	1.30%

Note: *(This table is multiple response sets; therefore, percentages of the cases do not add to 100%, percentages of the cases is n\f)*

Antenatal Care and Pregnancy Outcome

Regarding birth outcome, 388 (96.5%) women experienced normal birth outcome for their last delivery. More than half 226 (56.2%) of women decided the place of delivery by themselves and followed by the husbands giving the decision where the women should give birth [89 (22.1%)]. One fourth, 143(25.3 %*) of the women reported a decrease in fetal movement as a danger sign of pregnancy and followed by 124 (21.9%) reporting vaginal bleeding and also 158(39.3%) women did not know any of the danger signs during pregnancy.

Majority of the women 342(85.1%) had ANC visit at least once and more than four in ten 158(46.2%) had ANC visit 4 times during pregnancy for their most recent live birth. Among these, 288 (71.6%) and 39(9.7%) women had their ANC follow up in the second and first trimester respectively

Nearly from every ten women, eight women (79.6%) got advice about the importance of institutional delivery during their ANC visit. With regard to the perceived level of satisfaction during ANC care, 294 (73.1%) women reported that they were satisfied.

Approximately three fourths 299 (74.4%) women believed that the information given to health professional during service were kept confidential and 293 (72.9%) women considered providers maintained the privacy of the clients during care ***(Table) next page.***

Table 3: Antenatal Care and Pregnancy Outcome of Women for the Choice of Place of Delivery in Wondo Genet District, Ethiopia 2018.

Variables	Categories	No_ (%)
Past birth outcome	**Normal**	388(96.5)
	Abnormal	14(3.5)
Last pregnancy planned	Yes	324(80.6)
	No	78(19.4)
Number of living children	1-2	199 (49.5)
	3-4	133 (33.1)
	>4	70 (17.4)
History of stillbirth	Yes	34(8.5)
	No	368(91.5)
History of abortion	Yes	42(10.4)
	No	360(89.6)
Antenatal care visit for last pregnancy	Yes	342(85.1)
	No	60(14.9)
First antenatal care booking (n=342)	< 4 months	39(9.7)
	4-6 months	288(71.6)
	>6 months	8(2.3)
	I do not know	7(2)
Frequency of ANC visit(n=342)	1-3 times	184(53.8)
	4 and more	158(46.2)

Determinants of Institutional Delivery

On bivariate logistic regression analysis, each independent variable was entered with the outcome variable to see their association. Variables which fulfilled all the assumptions were selected by the model for multiple logistic regression. This study revealed that women who were unable to read nor write were seven times less likely to give birth in a health facility compared to women who had secondary education and above [AOR=0.14, CI, 0.03-0.68].

Respondents with average monthly income of more than 3000 ETB were eight times more likely to deliver in a health facilities compared to those with a monthly income of less than 3000 ETB [AOR=8.35 CI, 3.6-19.4].

Family planning was an important predictor of institutional delivery. ***Table 4*** shows the odds of giving birth in a health facility were nearly three times higher among respondents who had planned pregnancies compared to those whose pregnancies were not planned [AOR=2.6 CI,1.2-6.6].

Direct relationship was observed between frequency of ANC follow up and institutional delivery which means participants who had ANC follow up of four and more times were four times more likely to deliver in health facilities compared to those who had ANC follow up of less than four times [AOR = 4.14 CI,2.0- 8.6].***(Table 4)***

Table 4: *Multiple Logistic Regression Analysis for the Choice of Place of Delivery among Mothers in Wondo Genet District, 2018*

Variables	Institutional delivery	Home delivery	COR, 95% CI	AOR, 95% CI	P-Value
Age (in years)					
18-24	97	36	5.05 (1.97, 12.9)	1.69(0.3, 9.5)	0.55
25-34	141	105	2.52 (1.03, 6.16)	1.67(0.35, 7.9)	0.52
>35(ref)	8	15	1	1	
Place of residence					
Urban	152	34	5.802 (3.7, 9.2)	2.0(0.93, 4.46)	0.07
Rural (ref)	94	122	1	1	
Educational status of women					
Not able to read and write(ref)	61	86	0.047(.016, .13)	0.14(0.03, 0.68)	0.015*
Primary and above	125	66	0.12(.044, 0.36)	0.24(0.05, 1.0)	0.06
Secondary and above	60	4	1	1	
Occupation status of women					
House wife (ref)	133	116	1	1	
Farmer	61	29	1.83(1.1, 3.0)	1.43(0.6, 3.46)	0.42
Government employee	52	11	4.12(2.0, 8.2)	0.82(0.3, 2.3)	0.72
Average monthly income					
≤ 3000 ETB (ref)	88	146	1	1	
> 3000 ETB	158	10	26.2(13.1, 52.35)	8.35(3.6, 19.4)	.000*
Access to media					
Yes	216	88	5.56 (3.38, 9.13)	1.5(0.63, 3.5)	0.35
No (ref)	30	68	1	1	
Last pregnancy planned					
Yes	224	100	5.7(3.3, 9.85)	2.6(1.1, 6.6)	0.042*
No (ref)	22	56		1	
Number of living children					
1-2	148	51	6.77(3.7, 12.36)	2.9(0.94, 9.5)	0.06
3-4	77	56	3.2(1.73, 5.94)	1.75(0.58, 5.2)	0.32
>4	21	49	1	1	
The frequency of ANC visit					
1-3	102	82	1	1	
4 and more	140	18	6.25(3.53, 11.06)	4.14(2.0, 8.6)	0.000*
Distance from a health facility					
< 5 km	172	50	13.07(6.08, 28.1)	2.0(0.6, 7.2)	0.0251*
5 to 10 km	64	68	3.57(1.65, 7.77)	0.6(0.18, 2.2)	0.495
>10 km(ref)	10	38	1	1	

(* is p <0.05 is significant,)

Discussions

The study investigated 402 women who had delivered within the preceding 12 months in the Wondo Genet District of Ethiopia to assess determinants of choice of place of delivery. About three-fifths (61.2%) had delivered in health facilities, while the remaining two-fifths (38.8%) delivered at home. Respondents had been more likely to choose to have the facility of delivery if :

1. The level of education was secondary or higher
2. The average monthly income was above 3,000 ETB (US$ 128.73)
3. The pregnancy was planned
4. They had 4 or more antenatal visits
5. They lived less than 5 km from the health facility.

Being unable to read nor write strongly influenced the decision to deliver at home.

Regarding the age of the respondents, 61.2% of the respondents were in the age group of 25-34 years. Nearly similar to studies done in rural Bangladesh [23] and Tanzania [24]. Despite a study done in rural Kenya which found 40% of women aged 25–34 years old that was higher [25]. This variation may be due to the latter study having very large sample size which may result in a large number of other age group and the other explanation for the discrepancy may be due to the latter being a community-based study.

In respect of educational status of respondents, 36.6% were not able to read nor write. They had never attended any formal class. This was very high compared to a study done in northern Ibadan, Nigeria in which only 17.7% of women had no formal education[26]. The reason for that difference could be sample size used by the later study which was only 231 participants.

Secondly, may be the later study was done in a government and a private hospital where more educated women could be found. In spite of this study being done at district level. The literacy level of reproductive age of women of the two countries vary considerably hence this can be also the other reason for the difference [27].

The study reported that, 85.1% of respondents had at least once visited an ANC. That was relatively comparable with a study done in Dodota District, Oromia region which found 82% of women had visited the ANC for their recent pregnancy[28]. This findings were higher than a study done in Sekela District, Northwest Ethiopia which found only 44 % of women had once visited an ANC [8].

This discrepancy might be due to time factor between the two studies. Currently, women's knowledge of the importance of having ANC visits is relatively better and get better access to information. Therefore, they were more likely to be better informed and educated. The other reason might be the latter (study done in Sekela District) was a community-based study in which there would have been a lesser chance of finding women who had a history of ANC visit.

The study found the prevalence of institutional delivery for the district was 61.2% which was higher than that of Gurage zone which was 31% [29]. This difference might have been due to study time (5 year)'s difference. The time difference might affect the prevalence of institutional delivery as in recent times, government and non-government bodies had given more emphasy on pregnant women to reduce maternal complication and death. It could be because it was community-based study in which high numbers of respondents who delivered in homes were found in the community.

This figure was higher than that of National Demographic Health Survey(EDHS) 2016 which reported institutional delivery as 26%. The difference may be due to EDHS requesting for women's experience 5 years prior to the survey. Thus retrospective assessment of their place of delivery may be affected by time variation.

Beside the Ethiopian Demographic Health Survey(EDHS) used household survey in which a large number of mothers who delivered at homes could be found but current study used institution-based assessment.

The prevalence of institutional delivery in this study was lower than a study done in three districts of Tanzania which found that 74.5% of women deliver in health facilities. This difference could be due to the differences in socio-demographic characteristics of respondents [11].

The high prevalence of institutional delivery in this study could be attributed to all services and care related to delivery being totally free of charge in all levels of governmental health facilities throughout the country.

The present study found that secondary and above educational attainment of the respondents was a significant determinant of institutional delivery. This finding was consistent with other studies in which relatively educated women consistently utilized health facilities for delivery[10,8,25,28]

As most literature indicate that, educated women might have access to modern information particularly related to the importance and safety of institutional delivery, have access and control to resources, they have the power to make decisions at household level.

Average monthly income of more than 3000 ETB was an important predictor of institutional delivery in this study. Women who have an average monthly income of greater than the median income of the respondents were eight times more likely to deliver in a health facility. This was consistent with many other studies [11 13, 17, 18]. All these studies found that women with better economic status were more likely to deliver in a health facility.

It is understandable that, socio-economic difficulties can have an undesirable effect on maternal health and that, indicators such as level of household wealth and level of education are associated with women‘s utilization of all maternal health care services. Women with better income take the initiative to visit health facilities for maternal and other health services [14].

The present study found that, the odds of giving birth in health institutions were four times higher among respondents who had planned their pregnancy than respondents who had unplanned pregnancies. This was similar to a study done in Addis Ababa which found the odds of giving birth in a health facility was 2 times higher among respondents who had planned pregnancy (AOR = 2.11) compared to those who had not [30].

A study done in Bahir Dara city administration found that planned pregnancy was not a statistically significant factor for institutional delivery [31].

When women have planned a pregnancy, it was believed that, they were ready economically and psychologically. Therefore, those participants took the initiative to deliver in health facilities and have healthy babies. Beside, that woman with planned pregnancy was more likely to be educated with better accesses to information which lead her to institutional facility delivery.

Despite the significant findings made in our study, the limitation of the data used is worth mentioning. Thus, by relying on a cross-sectional data, it is impossible to account for unobserved heterogeneity. Moreover, associations found between the dependent and the explanatory variables may vary over time. Women could participate in this study if they had delivered within 12 months, there is the possibility of recall bias in that the women might not have been able to remember circumstance surrounding an event that happened several months prior to the survey.

Conclusion

The prevalence of respondents who gave birth in health institutions was 61.2% in the study. The factors associated with institutional delivery were respondent's educational status, average family monthly income, the frequency of ANC, planned pregnancy and were important determinants.

Recommendations

The District Health Committee should work on myth and misconception surrounding institutional delivery.

Appropriate information, education, and communication will be a vital strategy to enhance knowledge of the women and help them take the initiative and visit health facilities. Since most rural women have given birth in their homes, more emphasis should be given for women who reside in rural areas.

Women’s education is vital for empowering women and enable them to take a positive steps for their maternal and family health. Enhancing the existing adult education program also should be considered as an intervention method for addressing illiterate mothers.

The District Health department should utilize intensive Community Health Extension Workers(CHEWs) to disseminate information about

the relevance of institutional based delivery for child bearing mothers by giving more emphasis to rural residents. In addition to this, the Couunty Health Department can use selected groups in the community like religious leaders, husbands, community elders to bridge the knowledge gap.

Abbreviations

ANC – Ante Natal Care,
EDHS - Ethiopian Demographic Health Survey
ETB -- Ethiopian Birr
ICPD – International Conference on Population Development
MMR – Maternal mortality ratio
MDG – Millennium Development Goals
PAULESI - Pan African University Life And Earth Science Institute
SBAs – Skilled Birth Attendants
SSA _ Sub Saharan Africa
SDG _ Sustainable Development Goals
SPSS – Statistical Package for Social Science
TBA – Traditional Birth Attendants
UNFPA – United Nations Fund for Population Activities,
WHO – World Health Organization.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the University of Ibadan, University College Hospital (UCH) ethical committee and ethics referral No_ UI/EC/17/0015. The supporting letter was received from local government of Ethiopia. The study subjects provided written consent to participate in the study after receiving information about the purpose of the study, risks and benefits, and their rights. Assurance of privacy during the interview and confidentiality of information was given.

Consent for Publication

"Not applicable".

Availability of Data and Materials

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

Declaration

The authors declare that they have no competing interests.

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Authors' Contributions

All the authors contributed substantially to this manuscript. Author 1.HU: Initiated the research, wrote the research proposal, conducted the research, did data entry, analysis and wrote the manuscript. Author 2 TT supervised the research from proposal to the final manuscript and participated in data entry, data analysis, write up and edited manuscript. Both authors read and approved the final version of this manuscript and have equally contributed to its content.

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