Ethiopian Journal of Health and Biomedical Sciences

Original article Open access

Bypassing nearby Health Centers for Childbirth Services and its Associated Factors among Mothers Attending Postnatal Care at the University of Gondar Comprehensive Specialized Hospital, 2018: A Facility-based Cross-sectional Study

***Mengistu Mekonnen Kelkay*[1]*, *Meseret Kiros Zegeye*[2], *Abebaw Addis Gelagay*[3]**

[1]*Department of Pediatrics and Child Health Nursing, School of Nursing, College of Medicine and Health Sciences, University of Gondar,* [2]*University of Gondar Comprehensive Specialized Hospital,* [3]*Department of Reproductive and Child Health, Institute of Public Health, College of Medicine and Health Sciences, University of Gondar*

[*] ***Corresponding Author:*** *Mengistu Mekonnen Kelkay: mesyfikir21@gmail.com*

Citation: Kelkay MM, Zegeye MK, Gelagay AA. Bypassing nearby Health Centers for Childbirth Services and its Associated Factors among Mothers Attending Postnatal Care at the University of Gondar Comprehensive Specialized Hospital, 2018: A Facility-based Cross-sectional Study. Ethiop J Health Biomed Sci. 2023 Mar. 30;13(1):33-45.

DOI:https://doi.org/10.20372/ejhbs.v13i1.400

Article History

Received: August 09, 2022

Revised: February 22, 2023

Published: March 30, 2023

Keywords: Utilization, Reasons, Bypass, Health Center, Perceived, Ethiopia

Publisher: University of Gondar

Abstract

Background*: In the health care system, bypassing affects both the primary level and higher-level health care institutions. It compromises the quality of care rendering to the clients of lower and higher level health care system by causing an overcrowded. And overflow of delivering mothers to higher level causes unnecessary workload, overcrowding, shortage of medical supplies, equipment, drugs, and service dalliance in the health facility which may contribute to institutional maternal and neonatal morbidities and mortalities. Moreover, it causes a client to wait a long time, yet the health care providers devoted their time to looking at minor cases which decreases access to the needy clients. Therefore, this study aimed at assessing all these gaps, which are an important indicator of the quality of care in the health system.*

Method*: Facility based cross-sectional study was conducted from August 1-30/2018. A systematic random sampling technique was used to select 391 study participants. Data were entered into Epi Info version-7 and exported to SPSS version 20 for analysis. Logistic regression was computed. Variables whose P-value is ≤ 0.2 in the bi-variable analysis were fitted to the multivariable analysis, and an adjusted odds ratio with their corresponding 95% confidence interval was calculated to determine the statistical association.*

Results: *Four hundred twenty two mothers were invited to participate in this study out of which 391 mothers respond properly giving a response rate of 96.65%. Overall 246 (62.9%, 95% CI: (58.1, 67.5)) mothers bypassed their catchment health center. Age of the mother, resident, educational status of unable to read and write and primary education, marital status, first time parity, informed where to deliver during ANC follow up and mothers who have no information about the availability of childbirth service at the health center were factors associated with bypassing of nearest health center.*

Conclusion*: The proportion of women bypassing health centers is high. The individual characteristics that predicted increase in proportion of respondents who bypassed health facilities includes, age, educational and marital status, resident and first time parity. On top of these, information given to the pregnant mother where to deliver and the service availability were found to be important predictor variables; therefore, efforts has to be made with regard to these variables, and a special attention has to be given on information provision by the care provider during ANC care.*

Introduction

Childbirth at a health facility by a skilled birth attendant is one of the essential parts of the Sustainable Development Goal (SDG). It is also a global key strategy to end preventable maternal and newborn obstetric complications, including deaths that may arise during labor and childbirth. However, variations in obstetrics complications, including maternal mortality, remain one of the striking health injustices in the world. And this is especially true in low-resource countries like Ethiopia(1).

Bypassing the nearby birthing health facility is common in developing countries; therefore, bypassing has an important implication for maternal/child health service delivery and human resources within a health system (1, 2)

Bypassing health facilities for care is an observable fact where individuals choose to get care from a health facility that is not nearest to them. Despite many health systems in low and middle income settings are tried, not all have formal gate keeping functions. In a tried health care system, mild cases or non-complicated cases can be managed in the primary care setting, and only complicated cases can be referred to next level health care facilities. In light of the view of the health care system, bypassing affects both the primary level health care institution as well as the higher-level institution. One of the devastating effects of bypassing on higher-level health care system is compromising the quality of care rendering to the clients because of overcrowding and lessening the contact time between clients and health care professionals (2).

Countries in Africa and other low-income areas have focused on expanding the primary care system by increasing health center (HC) staffed with nurses and midwives who can provide basic obstetric care (3).

Enabling environment for safe motherhood and childbirth services depends on skilled health personnel and the availability of adequate healthcare facilities, equipment, and medicines and emergency care (4, 5). Availability, access, and utilization of safe motherhood services are important in reducing maternal deaths. In particular, the availability of birthing facilities is one of the critical strategies to reduce maternal mortality in a developing country.

Bypassing lower-level facilities result in underutilization of the facility too, because of the loss of skills required to provide obstetric care. The low flow of delivering women to the HC contributes to underutilization of human resource and delivery instruments and wastage of drug due to low utilization of services in the HCs. Similarly bypassing lower facilities results in simultaneous overcrowding of those at the higher level, and this harms the ability of the health system to provide timely, efficient, and quality care across different levels of the system (6). In the meantime, overflow of delivering mothers to hospitals causes unnecessary workload, overcrowding, shortage of medical supplies (like equipment and drugs) and service delay in the health facility which, in turn, may contribute to institutional maternal and neonatal morbidities and mortalities. Moreover, it causes a client to wait a long time to be seen by well-trained health care providers (HCPs); yet the HCPs devoted their time attending minor cases which hinder access to the needy clients. This affects the health office further planning for human power, materials, and budget (7, 8). Different studies showed that the magnitude of bypassing as 70.2%, 55%, 41.8%, 59%, and 38% (9-12).

Some evidence indicated that bypassing nearest health center is affected by several factors including maternal age, educational level of the women, occupational status of women and husbands, place of delivery, mode of delivery, number of pregnancies, and awareness about the availability of delivery services. Moreover, several characteristics of bypassers which affect mothers' choice of health institution like concerning parity, frequency of antenatal care visit and intrapartum complications were identified (13, 14). However, the determinants of bypassing the nearest HC services were not the same across different cultures and socioeconomic status within a country. Mothers often bypassed the nearest health center if they perceived, it has shortage of health professionals and inadequate medical equipments (15).

Despite the general recognition of bypassing primary care units for different services have a common problem in Ethiopia, particularly in the study area, the magnitude of bypassing HC for childbirth service and factors affecting bypassing have not been well studied.

The study finding will contribute for the referral hospitals to identify and measure daily actual and potential work load which potentially hinder delivering quality of services. The

finding will, then, serve to take proper action accordingly if communications take place with concerned bodies.

The finding will also be used as an input for health service delivery program at local and regional level for awareness creation on importance of healthcare utilization in the nearby health facilities; it can used to support healthcare managers and policy makers by giving direction for further monitoring and evaluation, planning, appropriate allocation of resources. Therefore, this study attempted to measure the magnitude and associated factors of bypassing HCs to receive childbirth service at the hospital level.

Method

Study design

The facility-based cross-sectional study design was used.

Study Area and Period

The study was conducted at the University of Gondar Comprehensive Specialized Hospital (UoGCSH) from August 1-30/2018. Gondar is located about 727 km Northwest of Addis Ababa. According to the 2007 National Census, it has a population of 207, 044. It has 21 kebeles. Currently, Gondar town has one referral hospital, eight government HCs, two private clinics, and one Nongovernmental Organization (NGO) clinic which provides childbirth healthcare service.

UoGCSH is among the famous and oldest tertiary level referral and teaching hospitals in the country that provides services to over 5 million inhabitants in the Northwest, Ethiopia. A large number of people from the surrounding zones and nearby regions visit the hospital.

Source population

All Postnatal women who delivered at the University of Gondar Comprehensive Specialized Hospital were source population for this study.

Study population

Postnatal women who gave birth, irrespective of the mode of delivery, at the University of Gondar comprehensive specialized hospital during the study period were study population.

Inclusion and Exclusion criteria

Inclusion criteria: mothers who were admitted at the University of Gondar comprehensive specialized hospital delivery ward for delivery services were included.

Exclusion criteria: Mothers who came outside of Gondar for childbirth service were excluded.

Sample size calculation

The Sample size was determined by single population proportion formula with an assumption of 50% proportion (since there is no previous study in Ethiopia), a 95% confidence interval with a 5% margin of error plus a 10% non-response rate.

So, with adjustment for non-response rate (10% contingency) n= (384+38), the final sample size was **422**.

Sampling technique and procedure

A systematic random sampling technique was used to select the sample participants for the study. There were 8,664 mothers who were getting childbirth service at the University of Gondar hospital; by dividing this annual total number of mothers to 12 months, we can get a population of (N= 722) for each month. This means, an average of 722 mothers was visiting the hospital for childbirth services every month. Sampling interval (K) = N/n was determined by dividing the number of units in the population by the desired sample size: that is K= 722/422=1.71. Lottery method was used to select the first participant between 1 and 2, then as a sampling unit every 2 postnatal mothers were interviewed when they came for childbirth service and postnatal follow up during the study period.

Data collection tool and procedures:

Data were collected using interviewer-administered pretested questionnaire. The questionnaire was prepared first in English by reviewing different literatures, and then translated to the local language (Amharic) by a language expert to check its consistency and clarity.

After carefully reviewing and developing, the tool was organized into four sections: socio-demographic, past and present obstetric characteristics (12 item questionnaires with Cronbach's Alpha or reliability of 0.743 in the current study), Pregnancy and maternal health service seeking characteristics (4 questions, reliability of 0.717), and Health facility childbirth service provision related factors 6 questions, reliability of 0.558)

Four post basic neonatal nursing students were employed as a data collector and two supervisors having a BSc degree follow the data collection process. Data were collected using a

face-to-face interviewer-administered questionnaire. Data collectors and the supervisor were trained on the objectives, importance of the study, confidentiality issue, participants' right, informed consent, and techniques of interviewing and collecting the required information.

Data quality control and assurance

Before the data collection, the questionnaire had been pretested in 5% (21 mothers) of the sample population to maintain its power and trustworthiness. The Questionnaire was prepared in English and then translated to Amharic, a local language, by language experts.

The quality of the data was ensured during the collection, entry, and analysis. Before data collection, one-day training was given to the data collectors and the supervisor. Supervision was made throughout the data collection period. Finally, the completeness of the questionnaire was checked by the principal investigator and manually cleaned before data entry. Multicollinearity was checked using Variance inflation factor (VIF) and tolerance, and there was no multicollinearity.

Operational Definitions

Bypassed: Defined as self-referred pregnant/postnatal woman that directly comes from home to the University of Gondar Comprehensive Specialized Hospital for childbirth service.

Not-bypassed: Defined as a pregnant/postnatal woman that comes to the University of Gondar Comprehensive Specialized Hospital with referral paper from the nearest HC.

Childbirth services: The service provided to the mothers who came to the University of Gondar Comprehensive Specialized Hospital to give birth.

Data processing and analysis

The completed data were entered into Epi Info 7 and exported to SPSS version 20. The data analyses were carried out using SPSS software. Descriptive statistics such as Proportions and summary statistics (mean and standard deviation) were calculated for most of the variables. Bi-variable and multivariable logistic regression analyses were conducted to identify predictors of bypassing the nearby health centers for child birth. Variables with a p-value of less than 0.2 on bi-variable regression were entered into multivariable logistic regression analysis. The association between bypassing and independent variables was assessed using AOR with its 95% CI and a P-value of less than 0.05 in the final model.

Result

Socio-demographic Characteristics of women's

Among the 422 postnatal women approached by the data collectors at UoGCSH, 391 (92.65%) of them participated in this study. The mean age of respondents was 26.67 years with a standard deviation (SD) of ± 5.112. About three-forth (73.7%) of postnatal mothers' lives in urban kebele and 116 (29.7%) of mothers attended secondary education. Among respondents, 276 (70.6%) were orthodox followers, 302 (77.2%) were Amhara by ethnicity and more than 93.1% of them are married, and 126 (32.2%) of mothers are governmental employees. Concerning socio-demographic characteristics' of their couple, 268 (73.6%) were attained primary education, 165 (45.3%) were employed in governmental organizations **(Table 1).**

Obstetric Characteristics of postnatal mothers

Among 391 postnatal mothers, 243(62.1%) had two or more pregnancies. Out of the 243 who gave birth previously 140 (58%) delivered in the hospital. From previous pregnancies only 34(14%) of mothers have got pregnancy-related problem, out of which 14(41.17%) comprises of vaginal bleeding; 10 (4.12%) of mothers developed obstetric problems. and 6 (60%) encountered blood pressure raised.

Maternal health service seeking characteristics

Regarding antenatal care, 364 (93.1%) recently delivered women reported that they attended at least one visit of antenatal care, and from this, 254(65%) of the mothers have attended antenatal care with a frequency of four or more visit. About the place of ANC, the majority of the pregnant woman (which is 261 (71.7%)) attended ANC at the hospital. From mothers who attained ANC in their recent pregnancy, 246 (62.9%) of mothers were informed about the place of delivery.

In addition to this, all postnatal mothers were asked whether they know the availability of childbirth services in the nearby HCs, and 253(64.7%) of them responded that they have clear information about the availability of the services.

Mothers who came directly from home to the hospital were also asked about who made the decision, 149 (60.6%) replied that the decision was made along with their husband. Regarding the mode of delivery 353 (90.3%) of mothers had spontaneous vaginal delivery **(Table 2).**

Table 1: Socio demographic characteristics of mothers who were getting child birth services at University of Gondar comprehensive specialized hospital, Ethiopia, August 2018 (n =391)

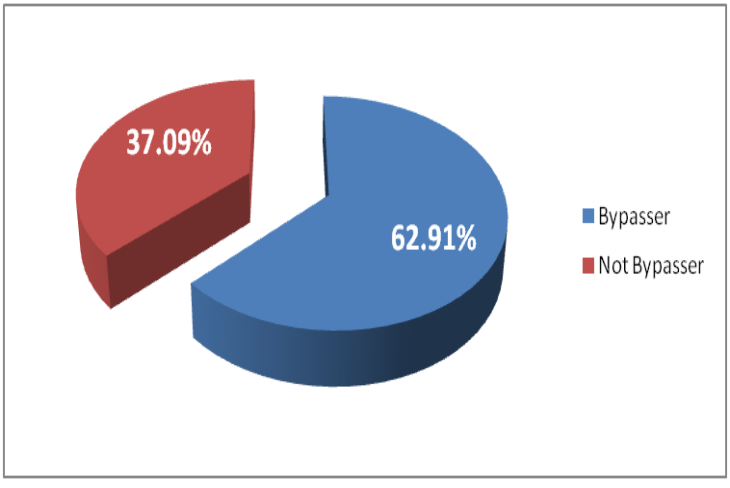
Variable (n=391)	Category	Frequency	%
Maternal age			
	<20	27	6.9
	20-34	332	84.9
	≥ 35	32	8.2
Residence			
	Urban	288	73.7
	Rural	103	26.3
Education			
	Unable to read and write	70	17.9
	Primary	95	24.3
	Secondary	116	29.7
	Diploma and above	110	28.1
Religion			
	Orthodox	276	70.6
	Protestant	35	9.0
	Muslim	67	17.1
	Catholic	13	3.3
Ethnicity			
	Amhara	302	77.2
	Tigray	71	18.2
	Oromo	18	4.6
Marital status			
	Currently married	364	93.1
	Single	3	0.76
	Divorced	10	2.56
	Widowed	14	3.58
Respondent's occupation			
	Governmental employee	126	32.22
	Private employee	44	11.25
	Daily laborer	41	10.48
	Merchant	50	12.8
	House wife	66	16.88
	Student	35	8.952
	Servant	13	3.3
	NGO	9	2.3
	Farmers	7	1.8
Husband's education (n=364)			
	Unable to read and write	2	0.5
	Primary(1-8)	268	73.6
	Secondary(9-12)	56	15.4
	Diploma and above	38	10.4
Husband's occupation (n=364)			
	Governmental	165	45.3
	Private (NGO)	67	18.4
	Daily laborer	42	11.6
	Merchant	59	16.2
	Student	31	8.5

Table 2: Facility related and maternal health seeking characteristics of mothers at the UoGCSH, Ethiopia, August 2018 (n =391)

Variables	Category	Number	Percent
ANC attended for the recent pregnancy			
	No	27	6.9
	Yes	364	93.1
Place of ANC attendance			
	HC	103	28.3
	Hospital	261	71.7
Number of ANC visit			
	One visit	18	4.95
	Two to three visits	92	25.3
	≥ 4 visits	254	69.75
Information is given where to deliver during ANC			
	No	150	38.36
	Yes	241	61.64
Information about childbirth service during ANC			
	No	138	35.3
	Yes	253	64.7
Did you came directly from home to the hospital			
	Yes	246	62.9
	No	145	37.1
Who decided to go directly to the hospital			
	My self	68	27.6
	My husband	29	11.8
	Both	149	60.6
Modes of delivery for the recent birth			
	vaginal delivery	353	90.3
	Cesarean section	38	9.7
Knowledge of childbirth service availability			
	Yes	253	64.7
	No	138	35.3

The Magnitude of bypassingHCs

In the current study, among 391 postnatal women, 246 (62.9%, 95% CI: (58.1, 67.5)) bypassed their nearest health center for childbirth services **(Figure 1).**



Magnitude of Bypassing nearby Health Centers for Childbirth Services among mothers attending postnatal care at the University of Gondar Comprehensive Specialized Hospital, 2018

Reasons for bypassing nearest HCs reported by mothers

Among the reasons for bypassing the nearest health center, the major reason for mothers to bypass the nearest HC was perceived poor quality of health service 130(33.2%) followed by unavailability of medical equipments/drugs, and the least reason was unethical behavior of the health care providers **(Figure 2)**

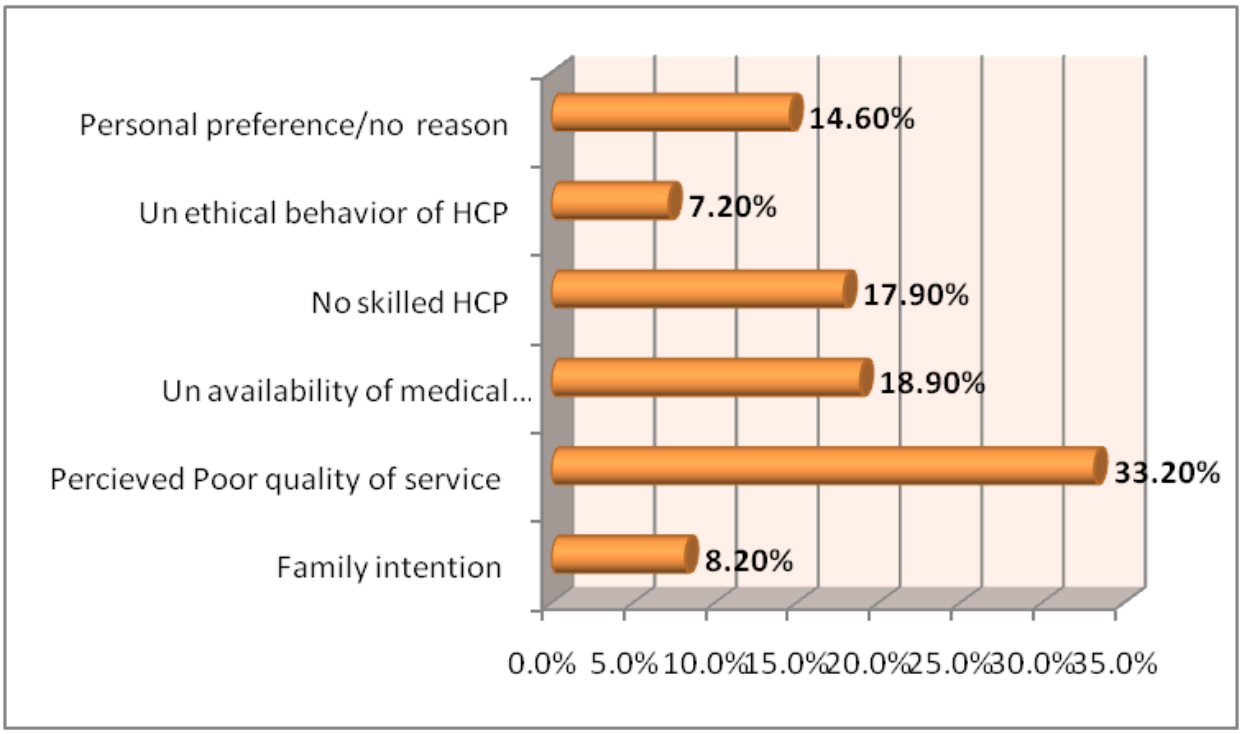


Figure 2: *Mothers reasons of bypassing the nearest health center for childbirth center at University of Gondar CMHS comprehensive specialized hospital, August 2018, Ethiopia (n = 391)*

Bi-variable and multivariable analyses of factors associated with bypassing nearby HCs among postnatal woman at University of Gondar Comprehensive Specialized Hospital

All variables having p-value <0.2 in the bi-variable analyses were included in the multivariate analyses model. The multivariable analyses model showed that age of the mother, resident, mother level of education, marital status, first-time gravidity, the information given where to deliver, and knowledge about childbirth service availability were statistically significant predictors' of bypassing HC at p-value <0.05

Mothers whose age was less than twenty years were 90% less likely to bypass the nearest HC as compared to mothers whose age is greater than 35 years old [AOR: 0.10, 95% CI (0.02, 0.33)]. The odds of bypassing the nearest HC among mothers from the urban areas were 3.75 times more likely as compared to mothers lives in a rural area [AOR: 3.75, 95% CI (2.13, 6.61)].

Mothers whose educational status is 'unable to read and write' and 'primary' were 85% and 56% less likely to bypass nearest HC as compared to mothers whose educational status is a diploma and above [AOR: 0.15, 95% CI (0.07, 0.33)] [AOR: 0.44, 95% CI (0.21, 0.97)] respectively.

The odds of bypassing nearest HC among married woman was 5.6 times higher as compared to single, widowed and divorced mothers [AOR: 5.6, 95% CI (1.93, 16.2)]. The likelihood of bypassing nearest HC among first time pregnant Mothers were 2.86 times as compared to their counterpart [AOR: 2.86, 95% CI (1.52, 5.24)]

Mothers who were not informed about where to deliver during their ANC follow up was almost 2 times more likely to bypass their nearest HC as compared to who were well informed [AOR: 1.92, 95% CI (1.15, 3.45)], and mothers who do not know HC childbirth service availability were 2 times more likely to bypass as compared to their counterpart [AOR: 1.89, 95% CI (1.02, 3.47)] **(Table 3)**

Table 3: Bi-variable and multivariable analyses of factors among women who were getting child birth services at University of Gondar Comprehensive Specialized Hospital, Ethiopia August 2018 (n =391)

Variables	Bypassed HC		COR(95%CI)	AOR(95%CI)
	Yes	No		
Age of the mother				
<19	6	21	0.321(0.10, 1.02)	0.10 (0.02, 0.33)*
20-34	225	107	2.38(1.14, 4.95)	0.79(0.29,2.11)
≥35	15	17	1.00	1.00
Resident				
Urban	206	82	3.96 (2.46, 6.34)	3.75(2.13, 6.61)*
Rural	40	63	1.00	1.00
Mother's level of education				
Unable to read andwrite	25	45	0.16 (0.08, 0.31)	0.15(0.07, 0.33)*
Primary education(1-8)	57	38	0.44 (0.24, 0.81)	0.44(0.21, 0.97)*
Secondary education(9-12)	79	37	0.63 (0.35, 1.14)	0.74(0.37, 1.50)
Diploma and above	85	25	1.00	1.00
Marital status				
Married	239	125	5.5(2.25, 13.27)	5.6(1.93, 16.2)**
Others(single, divorce, and widowed)	7	20	1.00	1.00
Mothers occupation				
Governmental Employed	73	53	1.00	
Private	26	18	1.05 (0.52, 2.11)	
Merchant	24	26	0.67(0.35, 1.28)	
House wife/ Student/home maid/laborer	123	48	1.86(0.14, 3.02)	
First-time gravidity				
No	118	30	3.53 (2.20, 5.67)	2.86(1.52, 5.24)*
Yes	128	115	1.00	1.00
First-time parity				
NO	93	31	2.24(1.39, 3.59)	1.15(0.48, 2.94)
YES	153	114	1.00	1.00
ANC FU				
No	17	10	1.00(0.44, 2.25)	0.7 (0.23, 2.01)
Yes	229	135	1.00	1.00
No of ANC				
No ANC follow up	17	10	0.94(0.41, 2.15)	
Once	11	7	0.87(0.32, 2.34)	
2-3 times	55	37	0.83(0.51, 1.35)	
>=4 times	163	91	1.00	
Information is given where to deliver				
No	111	39	2.23(1.43, 3.48)	1.92(1.15, 3.45)*
Yes	135	106	1.00	1.00
Know about HC childbirth service availability				
No	97	41	1.65 (1.06, 2.57)	1.89(1.02, 3.47)*
Yes	149	104	1.00	1.00
Mode of delivery previously				
Vaginal delivery	222	131	1.00	
Caesarian Section	24	14	1.01(0.5, 2.02)	

**significant at p<0.005 **significant at p<0.001*

Discussion

In this cross-sectional study, it was attempted to find out the magnitude of bypassing nearby HCs to receive childbirth care at hospital level and factors associated with bypassing among postnatal women at the University of Gondar Comprehensive Specialized Hospital, North West Ethiopia.

The proportion of women accessing the University of Gondar Comprehensive Specialized Hospital for childbirth without going through public health centers for the same service was found to be 62.9%. This is high according to the nature of comprehensive referral hospital where more of the service has to be given to clients after they have been referred from primary health care like nearest HC

The bypassing status in this study is comparable with the bypassing level reported in Tanzania and Afghanistan where 59% and 60% of postnatal women bypassed their primary HC respectively (14, 22). In the current study, the extent of bypassing is, however, significantly higher than that of the preceding studies in India where only 37.7% of women who had health facility delivery had bypassed the nearest birthing facility (15).

This variation might be attributed to the differences in the tiers of the health care facilities, whereby the current study was carried out in a teaching and referral facility which is a tertiary facility; whereas, the studies in India were in the rural district hospitals. Besides, currently in India, facility birth rises from 39% in 2005 to 85% in 2014(19), and the study was conducted among rural mothers with a very limited chance of self-referral to the referral hospital, unlike the current study findings. On top of this, the Indian study uses a purposive sampling technique; as a result, the magnitude of bypassing primary HC was low compared to the current study (15).

Likewise, the current finding is also slightly higher than a study conducted in rural Chitwan Nepal which was 55 % (12). The possible justification for this difference could be attributed to the setting difference (where in Nepal study the researcher used only 6 rural villages) and study design difference (facility based design was used in the current study whereas community-based design in Nepal study).

Similarly, the current finding is higher than another study done in rural Tanzania that showed 41.8% of women bypassing the birthing service of the local primary care clinic (18). The possible reasons for the difference with a Tanzania study could be 1) the study settings where most of the residents have no chance to bypass the nearest healthcare since most of them are subsistence farmers; 2) the district connected to the region is by unpaved road (tertiary road) as a result the chance of bypassing is relatively low; and 3) the highly trained staff in rural Tanzanians study that are expected to perform basic emergency obstetric care and refer patients only with emergency conditions to a hospital.

However, the magnitude of bypassing in the current study was lower than the previous study conducted in Nepal which found 70.2% of women having health facility delivery had bypassed birthing centers (11) and in Tanzanian about (75.4%) of mothers bypassed their primary health care for childbirth service (30).

People generally tend to bypass the closer health facilities in favor of a better quality of service. A study on Nepal women rated birthing centers lowest in terms of adequacy of medical equipment and competency of health personnel compared to both public and private hospitals. The difference with Tanzania study was, even though their policy stipulates that women without previous complications should deliver at their nearest health care facility or health center and not at a referral level facility, the referral hospitals in Tanzania provides childbirth service to the majority of the woman.

The other possible justification for the difference could be attributed to the difference in study design. A community-based prospective cohort study design was applied in the Nepal study on pregnant mothers since 5 months of their gestational age to 45 days of post-natal period.

Consistent with another study in Nepal (12), Age of the postpartum women in this study was statistically associated with bypassing of the primary health institution. That is, mothers whose age was ≤19 years were 90% less likely to bypassed primary childbirth services as compared to mothers whose age is ≥35 years old. This is also supported by different studies. The possible reason might be related to the fact that older women might relate their past obstetric experiences with the present, and those rural women might lack some sort of information compared to urban ones India (15), Tanzania (18) and

Ghana (21). In addition to this, it is apparent that as women's age continue to advance, pregnancy related complications are expected. And as a result, these women are encouraged during antenatal visits to seek childbirth services from facilities that can handle pregnancy related complications in case arise during delivery.

The odds of bypassing nearest HC among mothers from the urban areas were 3.75 times more likely as compared to mothers lives in a rural area [AOR: 3.75, 95% CI (2.13, 6.61)]. This result is supported by a study conducted in Ethiopia [26] and Malawi (27). In Malawi, most urban dwellers' (which accounted 91%) do not utilize their nearest health care facility. This is because urban women are relatively aware of health facilities where better services are being provided than women from rural area. Additionally, rural women should walk long distance to go to Hospital bypassing the nearest health centers.

In the current study, maternal education had an association with bypassing HCs to receive childbirth services at hospitals. Mother whose educational status was unable to read and write and primary were 85% and 56% less likely to bypass nearest HC as compared to mothers having a diploma and above. This is consistent with the study done in Nepal (12) where the likelihood of bypassing was higher among educated women. Possible explanation to this is that with advance in education, women get more aware of the quality of care that they desire and which facilities could offer that kind of care. Similarly, with education, women are likely to be financially stable, hence, can afford to travel further in pursuit for quality maternal services. Similarly, educated women are more well-informed on the importance of quality of maternal health services by which obstetric complications can be effectively managed. Moreover, the decision-making power of women is high among educated ones than none educated. The expectation and preference of high quality of healthcare services in higher health institution thought to be high among educated women (28). The other possible justification could be the majority of respondents in different studies attended at least primary education, giving great opportunity to have information about quality childbirth services from different Medias' that potentially pushed them to seek childbirth services in hospital or other advanced health institutions.

Married mothers were 5 times more likely to bypass as compared to divorced and widowed mothers. Perhaps having a spouse to drive the partner makes it easier to travel farther for better services; in addition to this, the decision to choose the health care facility is stronger than single or divorced women (20).

Being first-time pregnant was another individual factor increasing the odds of bypassing, and this is in line with findings from studies conducted in India (16), Nepal (17), and Tanzania (23).

This finding suggests that women as well as their antenatal care providers regard first time pregnancies risky and therefore seek specialized obstetric care for these women. Literature has cited that first time pregnant women are likely to be more apprehensive about the delivery than women who have previously given birth. This is deemed to have an impact in their choice of delivery health facility in addition to the health care provider. Similarly, it has been argued that women who became pregnant for the first time might be more anxious about their delivery than women who had at least two pregnancies, and this might influence their choice of the health facility (12).

Mothers who were not informed where to deliver during their ANC follow up, and mothers who do not know HC childbirth service availability were 2 times more likely to bypass as compared to their counterparts. This result is supported by a study conducted in Sub-Sahara Africa (28) that mothers who have information and know availability of the service limits woman's choice and decision making on its utilization of the service, and in Western Ethiopia, mothers who knew that the availability of service to the closer HC 76% less likely to self refer themselves. In most cases, the knowledge of service availability can help to decide when and at what condition should the woman go to higher institution. In the meantime, they utilize their nearest health facilities cognizing that the service provided in different level will be the same, and they minimize the waiting time that they would encounter for the service in higher-level health institution (29).

It is well known that seeking quality of health service is the major reason for mother bypassing their nearest healthcare facility. In the current study, the major reason for mothers was perceived poor quality of health service; this was also supported by a study conducted in Chad which stated that women usually bypassed their nearest healthcare facility related to their perception of the quality of care received (24). Similarly, in a community-based cohort study conducted in Nepal, the most common reason mothers who bypassed were lack of

skilled service provider and inadequate physical facility in their nearest healthcare facility (7)

It is also true that in most of the cases, several reasons are stated about bypassing their nearest health institution, and it was believed that there is a strong preference of better healthcare, best provider, availability of drugs/medical supply and greater trust in health care provider at the hospital set up (19, 23).

Moreover, studies in Africa have shown that perceptions of higher technical quality attract women to give birth at hospitals rather than primary care facilities that typically lack resources to provide comprehensive emergency maternity care (19, 25).

Strength and limitations of the study

Strength

Interviewing postnatal mothers immediately after birth and within postnatal period just to avoid recall bias was one of the strength of this study.

Limitations

This study fails to consider the functionality of each health center (i.e number of HCPs, availability of drugs and medical equipments, availability of basic infrastructure e.t.c.), and can be cited as its major limitation. We are studying the phenomenon of bypassing that identified only patient's subjective perceptions of quality of care.

Conclusion

Bypassing of the nearest HC for childbirth services was high. Since nearly two-third of the deliveries in our hospital bypassed the nearby HCs and directly came from their home to the hospital for childbirth services which could have been provided in the nearest HC.

Recommendation

Basing on the findings of this study, the subsequent recommendations were made to the respective stakeholders:

- **To higher officials**
  - The FMoH should shift the focus of maternal care to HCs which are equipped to handle childbirth services. While seeking childbirth services, women should also be informed about maternal and child health services offered at these facilities to reduce the magnitude of bypassing county public health facilities.
  - The Chief Executive Officer of UoGCRH should work in conjunction with the FMoH towards the strengthening of the county referral system. This being a multifaceted approach, it will ensure that irrespective of maternal characteristics, women will be able to utilize the appropriate level of care while allowing referrals to higher level among women in need of specialized care.
- **For HC/facility administrators**
  - Communicating with concerned bodies to get supplies, equipments and medications necessary for maternal and child healthcare, particularly for labor and delivery services
- **For Service providers**
  - It should be imperative to create awareness during ANC visit about the availability of the service and disadvantages/risks of bypassing nearby HCs.
- **To Hospital**
  - The referral system has to be implemented as early as possible.
- **Areas for further researches:**
  - Study that apply mixed method (both qualitative and quantitative methods) to understand the bottlenecks at different levels and better address issue is recommended.
  - It would also be good if the researcher conduct a case control study.
  - With respect to the scope of this study, the current study did not incorporate data on objective or observed quality of childbirth care in the HCs. If future research focus on combining women characteristics with actual survey of the HCs, it would be of value to make a judgment on the perception of childbirth quality of care with observed authentic quality of maternal care in the same facilities.

Acknowledgment

We would like to acknowledge the University of Gondar, College of Medicine and Health Sciences for the financial support of this research project. We also extend our special thanks to data collectors, supervisors and study participants.

Declarations

Ethics approval and consent to participate: Ethical clearance was obtained from the institutional ethical review board of University of Gondar (UoG). An official letter of permission was given to the UoG CSRF and to all data collectors and supervisors. The participants also were informed clearly about the objective, benefit, and rights to participate or refuse or withdraw the interview. Study participants' privacy was respected and their confidentiality was maintained throughout the research process by giving code, omitting their names. Moreover, voluntary informed consent was obtained from study participants, and all the responses were kept confidential.

Consent for publication: Not applicable

Conflicts of interest/Competing interests: The authors declare that they have no conflicts of interests.

Funding: University of Gondar funded this research work.

Authors' contributions: All authors contributed to the study conception and design.

References

1. Ayele, B., et al., *Maternal and perinatal death surveillance and response in Ethiopia: achievements, challenges and prospects.* PloS one, 2019. **14**(10): p. e0223540.
2. Bell, G., et al., *Assessment of bypass of the nearest primary health care facility among women in Ghana.* JAMA network open, 2020. **3**(8): p. e2012552-e2012552.
3. World Health Organization. Primary Health Care – Now More Than Ever. 2008.
4. UNICEF. The state of the world's children 2009: maternal and newborn health: Unicef; 2008.
5. World Health Organization. Trends in maternal mortality: 1990 to 2013: estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division: executive summary. 2014.
6. Regional Health Bureau annual report Amhara regional state, Bahirdar, Ethiopia. 2007.
7. Karkee R, Andy H Lee, Binns CW. Bypassing birth centres for childbirth: an analysis of data from a community-based prospective cohort study in Nepal. Health Policy and Planning. 2015;30:1-7.
8. Mwabu G. Referral systems and health care seeking behavior of patients: An economic analysis. World Development 17. 2006:85-92.
9. Abrahim. O, Linnander. E, Mohammed. H, Fetene. N, Bradley. E. A Patient-Centered Understanding of the Referral System in Ethiopian Primary Health Care Units. PLoS One. 2015;10(10).
10. Audo MO FA, Njoroge PK. Quality of health care and its effects in the utilisation of maternal and child health services in Kenya. 2005;82(11):547-53. East African medical journal. 2005;82(11):543-53.
11. Rajendra K, Andy H Lee, Colin.W Binns. Bypassing birth centers for childbirth; an analysis of data from a communi ty-based prospective cohort study in Nepal. . Health Policy and Planning. 2015;30:1-7.
12. Rajani S. Bypassing birthing centres for child birth: a community-based study in rural Chitwan Nepal. Health Services Research. 2016;16(597):4.
13. Kruk ME, Hermosilla S, Larson E, Mbaruku GM. Bypassing primary care clinics for childbirth: a cross-sectional study in the Pwani region, United Republic of Tanzania. Bulletin of the World Health Organization. 2014;92(4):246-53. Epub 2014/04/05.
14. Kahabuka C, Kvale G, Moland KM, Hinderaker SG. Why caretakers bypass Primary Health Care facilities for child care - a case from rural Tanzania. BMC health services research. 2011;11:315. Epub 2011/11/19.
15. Mariano S, Kranti V, Ayesha DC. Bypassing health facilities for childbirth: a multilevel study in three districts of Gujarat, India. Global Health Action. 2016;9(32178).
16. Sabde Y, Chaturvedi S, Randive B, Sidney K, Salazar M, De Costa A, et al. Bypassing health facilities for childbirth in the context of the JSY cash transfer program to promote institutional birth: A cross-sectional study from Madhya Pradesh, India. PLoS ONE. 2018;13(1).
17. Shah R. Bypassing birthing centres for child birth: a community-based study in rural Chitwan Nepal. **BMC Health Service Research**. 2016;16(597).
18. Kruk ME, Paczkowski M, Mbaruku G, de Pinho H, Galea S. Women's preferences for place of delivery in rural Tanzania: a population-based discrete choice experiment.

American journal of public health. 2009;99(9):1666-72. Epub 2009/07/18.

19. Kruk ME, Mbaruku G, McCord CW, Moran M, Rockers PC, Galea S. Bypassing primary care facilities for childbirth: a population-based study in rural Tanzania. Health Policy Plan. 2009;24(4):279-88. Epub 2009/03/24.

20. Liu JJ, Bellamy G, Barnet B, Weng S. Bypass of local primary care in rural counties: effect of patient and community characteristics. Annals of family medicine. 2008;6 (2):124-30. Epub 2008/03/12.

21. Yaffee AQ. Bypassing proximal health care facilities for acute care: a survey of patients in a Ghanaian Accident and Emergency Centre. Tropical medicine & international health : TM & IH. 2012;17(6):775-81.

22. Tappis H, Koblinsky M, Doocy S, Warren N, Peters DH. Bypassing Primary Care Facilities for Childbirth: Findings from a Multilevel Analysis of Skilled Birth Attendance Determinants in Afghanistan. Journal of midwifery & women's health. 2016;61(2):185-95. Epub 2016/02/11.

23. Margaret. K, Godfrey. M, Colin. M, Molly. M, Peter. R, Sandro. G. Bypassing primary care facilities for childbirth: a population-based study in rural Tanzania. Health Policy and Planning. 2009;24(4):279-88.

24. Gauthier B, Wane W. Bypassing health providers: The quest for better price and quality of health care in Chad Soc Sci Med. 2011;73:540-9.

25. Olsen OE, Ndeki S, OF N. Human resources for emergency obstetric care in northern Tanzania: Distribution of quantity or quality? . Hum Resour Health. 2005;3(5).

26. Tarekegn SM, Lieberman LS, Giedraitis V. Determinants of maternal health service utilization in Ethiopia: analysis of the 2011 Ethiopian Demographic and Health Survey. BMC pregnancy and childbirth. 2014;14:161. Epub 2014/06/03.

27. Kenedy. Machira, Paramuleni M. Factors influencing Woman's utilization public health care services during child birth in Malawi public health facility utilization. Afri Health Science. 2017;17(2):400-8.

28. Kyei-Nimakoh M, Carolan-Olah M, McCann TV. Access barriers to obstetric care at health facilities in sub-Saharan Africa-a systematic review. Systematic reviews. 2017;6 (1):110. Epub 2017/06/08.

29. Wolkite OA, Waju BS, Gebeyehu TN. Magnitude and Determinants of Self-Referral of Patients at a General Hospital, Western Ethiopia. Science Journal of Clinical Medicine. 2015;4(5):86-92.

30. Kante AM, et al., Why women bypass front-line health facility services in pursuit of obstetric care provided elsewhere: a case study in three rural districts of Tanzania. . Tropical medicine & international health : TM & IH., 2016. **21**(4): p. 504-514.