

Time spent on provision of Antenatal Care and associated factors among public and private health facilities in Axum town, North Ethiopia: Comparative cross sectional study

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Abstract

Background

In most developing countries contact time between antenatal care attendees and providers have effects on health outcomes and quality of antenatal services. Effectiveness of focused antenatal care relies on standard time spent provisions. Hence this study evaluated the time spent & associated factors on provision of antenatal care in public and private health facilities in Axum Town, Northern Ethiopia.

Methods

Institutional based comparative cross-sectional mixed quantitative and qualitative methods were used. Data was collected through exit interviews with 456 antenatal care attendees. Qualitative data were also collected using an in-depth interview with providers. The collected data were entered using EPI info version 3.5.1 software then exported to SPSS version 21 software for analysis. Finally, multivariate logistic regression was employed to identify determinants of time spent on antenatal care provision at p-value < 0.05.

Results

Majority 378 (84.8%) of pregnant woman were served below the mean standard time in both public and private health facilities. The mean (\pm SD) time spent for first antenatal care provision in private was 19.7 (\pm 8.5) minutes, which is higher than public health facilities with mean time spent (\pm SD) of 13.2 (\pm 3.8) minutes. The mean time spent on antenatal care was significantly different in public and private health facilities. Factors that significantly affect time spent on provision of antenatal care were: type of health facilities [AOR = 2.60; 95% CI, 1.07–6.33], frequency of antenatal care visit [AOR = 3.50; 95% CI, 1.92–6.36] and language similarity with provider [AOR = 2.74; 95% CI, 1.23–6.12].

Conclusion

The mean time spent for first and revisit of ANC in both health facilities was lower than the WHO standards. Type of health facilities, frequency of antenatal care visit and language similarity with provider were predictors for time spent on ANC provision. Efforts should be targeted on standard provision of antenatal care.

Plain English Summary

In most developing countries contact time among antenatal care attendees and providers have effects on health outcomes and quality of antenatal services.

Institutional based comparative cross-sectional both quantitative and qualitative methods were conducted. Data was collected through exit interviews with 456 antenatal care attendees. The data were entered using EPI info version 3.5.1 software then exported to SPSS version 21 software for analysis.

Finally, multivariate logistic regression was employed to identify determinants of time spent on ANC provision at p -value < 0.05 .

Majority of pregnant woman were served below the mean standard time at both public and private health facilities. The mean (\pm SD) time spent for first antenatal care provision at private and public health facilities were 19.7 (\pm 8.5) and 13.2 (\pm 3.8) minutes respectively. The mean time spent on ANC provision was significantly different in public and private health facilities. Factors significantly associated with time spent on provision of ANC were: type of health facilities, frequency of antenatal care visit and language similarity with provider.

The mean time spent for first and revisit of ANC in both health facilities was shorter than the WHO standards. Type of health facilities, frequency of antenatal care visit and language similarity with provider were predictors for time spent on ANC provision. Efforts should be targeted on standard provision of antenatal care.

Background

Among the various big pillars of safe motherhood initiatives, antenatal care (ANC) remains one of the essential interventions that have potential to reduce maternal morbidity and mortality [1]. Despite the international emphasis in the last few years on the need to address the unmet health needs of pregnant women and children progress in reducing maternal and child mortality, it is still a challenging agenda [2]. According to the Ethiopian Demographic and Health Survey (EDHS) 2011 report, maternal mortality rate was 676 deaths per 100,000 live births [3].

World Health Organization (WHO) recommended strategies for a safer motherhood health, one of this was the new four-visit focused antenatal care (FANC) model with standard time spent which would allow 30 to 40 minutes for first visit and 20 minutes for revisit. It has been highlighted that since the number of visit is reduced to four in the basic component a “standard contact time” (SCT), Standard contact time is the length of time that health providers will need if they follow protocol and carry out appropriate steps with clients) [4].

While many factors affect the quality of ANC services, an emerging body of literature suggest that the amount of provider’s time spent with clients known as patient contact time (PCT) was a good proxy for quality and the basis for patients’ positive outcomes and it was one of the determinant for uptake, satisfaction and continued utilization of ANC service [5]. A study conducted at public health clinics in Bangladesh on the factors affecting of PCT showed that when one percent of patient service increase, the patient contact time reduced by 0.34%. [6]. The study done in Gambia on factors affecting ANC service offered at the public and private clinics showed that women at both health facilities (HF) did not received sufficient information, education and communication with their healthcare providers about the services provided during ANC [7].

Despite the fact that time spent on ANC service was an essential for quality of service and improvement of maternal and child health, the knowledge about client-provider time spent on ANC is not well studied in Ethiopia in general and in Tigray Region in particular. Therefore, the aim of this study is to evaluate the time spent on provision of ANC and to identify associated factors time spent at public and private HF in Axum Town, Northern Ethiopia. And the output of this study could be used for quality improvement of ANC services delivered by the health system and used as a baseline data in carrying out further research.

Methods And Materials

Study setting

Institution based comparative cross-sectional mixed quantitative-qualitative study design was conducted to evaluate the magnitude and associated factors of time spent on provision of ANC among public and private health institutions in Axum Town, Northern Ethiopia.

Axum town is one of the zones found in the region located about 235 kilometers from Mekelle, the capital city of Tigray and 1011 km away from Addis Ababa, capital of Ethiopia. According to the Ethiopian National census report in 2007, the total population of Axum town was 56,576 [8]. The study was conducted in three public Health facilities (HF) namely: Axum hospital, Axum health center and Millennium health center; and four private HF namely: Kaleb, Bazen, Tsion, and Senay higher clinics. Out of the total population of Axum town 30,293 are females with a pregnancy rate of 3.4% and the annual ANC service coverage in the study area was 95% [9]. The study period was from January 27 to April 1, 2015. All pregnant women attending in public and private HF for ANC service during data collection regardless of the number of visit were included. Pregnant women who were critically ill were excluded from the study.

Sample Size And Sampling Technique

The required sample size was calculated using a double-population proportion formula with the assumptions of 36% of pregnant women (ANC attendants) in public HF time spent were more than 30 minutes [10]. And 50% pregnant women time spent > 30 minutes were taken in private HF due to lack of similar study. And 14% significance difference was detected between public and private HF with 95% confidence level, power of 80%, and 1:1 ratio. The desired sample size after adding 10% non-response rate was 456. This was allocated to both private (228) and public (228) health care facilities.

The study included all ANC service delivery points (SDPs). To achieve the desired sample size the number of pregnant women was selected from each center by proportional allocation based on the preliminary survey average number of ANC users in the most recent one month report from each health facility. Study subjects at each health facility were selected using systematic random sampling until the required sample size was achieved. The sampling interval ($k = 3$) was calculated by dividing the average number of ANC users in the most recent one month report from each Health facilities to the total sample size.

Qualitative part

from the owner and managers of the health facilities 10 interviewees were selected. Hence there were no emerging new idea (information saturated) was reached further exploring idea is not needed. The key informants were purposively selected because of either they are the owner of private health facility or the manager of the facility to earn adequate and correct information.

Data Tools

The quantitative questionnaire was adopted from different literatures, which it is structured and standard [6, 11, 12]. The questionnaire was initially prepared in English and then translated into local language (Tigrigna) and again back translated to English to check for any inconsistencies or distortions in the meaning of words and concepts. Pretest the questionnaire was done at shire health facilities which are 60 kilometer away from the study area. Any question which was ambiguous and unclear was modified or removed based on the pretest results. The questionnaire included socio-demographic characteristics, staff commitment, health care related factors, client-provider communication, and reasons for ANC visit and knowledge on ANC service. Time spent between provider & clients was measured using stop watch monitoring, and open-ended interview guide using tape recorder (for provider's in-depth interview) and checklists for observational data (Number of ANC users per day) were also used to collect the qualitative data. To observe the availability of standard services at both health facilities item sentences was developed. The items of the question were categorized on basis of their level of agreement on five-point scale ranging from "strongly disagree" to "strongly agree" to the subject issues. The reliability of the items was checked by item correlation analysis. The results were reported using cronbach's alpha (α). The result for internal consistency of items was reported as cronbach alpha 0.67

Data Management And Analysis

Quantitative part

Data obtained from each study participant were entered, cleaned and analyzed using SPSS version 21 statistical software. Descriptive statistics such as mean \pm standard deviation, frequency and percentages were used to summarize the findings. Bivariable logistic regression model analysis was performed between time spent on ANC and each of the independent variables. Variables having a p-value < 0.05 with crude odd ratio correspondence to 95% CI were included in multivariable logistic analysis to identify predictors of time spent and to control confounding effect. In multivariable analysis, variables having p-value < 0.05 with adjusted odd ratio correspondence to 95% CI were considered as statistically significant. Finally t-test for significance difference in the mean time spent on ANC was assessed among public and private HF.

Qualitative data

The verbatim recorded information was analysed as, the Tigregna audio-recorded interviews were listened carefully and transcribed into texts. The transcribed data then translated it into its' equivalent

English and back to Tigrigna to ensure consistency and accuracy of wording and authentic representation of the participant's information. Sorting of the emerging themes after we read and become familiar with our texts. Then, we developed themes and coded. Finally we read all transcripts, the codes of transcripts, if there is irrelevant information reduced unnecessary data. Lastly the themes were shared into meaningful data that was the interpretation.

Data Quality Control

For qualitative data the interviewer prepared secure and silent environment for interviewing before interview has started and made ready logistic requirements to assure quality of data. Before they were standby for interview, the interviewer greets politely to set the environment friendly. Guiding questions were avoided.

Results

Socio-demographic Characteristics

A total of 446 subjects were participated in this study with of 98% response rate. More than half 228 (51.12%) of the participants were from public HF. The mean (\pm SD) age of respondents in both HF was 27.8 ± 5.2 years. Of those who served in public HF 38.6% was not attended formal education. Majority (92.2%) of the respondents who visited private HF were from urban dwellers whereas more than half (53.8%) of the respondents visited public HF. Concerning their income, 28.1% of those who visited public HFs had an income between 1501 to 3500 and 24.6% respondents earn < 500 Birr per month, whereas 33.5% of private HF participants had income between 1501 to 3500 and 17.0% of participants has an income below 500 Birr per month [Table 1].

Table 1

Socio-demographic characteristics of respondents among public and private health facilities, Axum town, north Ethiopia

Socio-demographic variables	Public-HF (N = 228) N (%)	Private-HF (N = 218) N (%)	Total (N = 446) N (%)	Chi-square	
				X ²	p-value
Age (Years)					
15–24	56 (24.6)	49 (22.5)	105 (23.5)	0.87	0.646
25–34	139 (61)	146 (67)	285(63.9)		
35–49	33 (14.5)	23 (10.6)	56 (12.6)		
Mean (± SD) years	28.0 ± 5.7	27.7 ± 4.7	27.8 ± 5.2		
Residence					
Urban	133 (58.3)	201 (92.2)	334 (74.9)	6.02	0.014
Rural	95 (41.7)	17 (7.8)	112 (25.1)		
Education status					
Not attended formal education	88 (38.6)	19 (8.7)	107 (24)	4.03	0.045
Primary education(1 to 8)	62 (27.1)	54 (24.7)	85(19.1)		
Secondary education	50 (2.9)	79 (36.2)	129 (28.9)		
Diploma & above	28 (12.3)	66 (30.3)	94 (21.1)		
Marital status					
Single	9 (3.9)	4 (1.8)	13 (2.9)	0.39	0.942
Married	219 (96.1)	214 (98.2)	433 (97.1)		
Occupation					
Student	2 (0.9)	5 (2.3)	7 (1.6)	15.35	0.009
Merchant	28 (12.3)	60 (27.5)	88 (19.7)		
Governmental employee	26 (11.4)	65 (29.8)	91 (20.4)		
Farmer & daily laborer	99 (43.9)	17 (7.8)	115 (26)		

* Indicates significant difference at p-value < 0.05

ETB = Ethiopian Birr

Socio-demographic variables	Public-HF (N = 228) N (%)	Private-HF (N = 218) N (%)	Total (N = 446) N (%)	Chi-square	
				X ²	p-value
House wife	63 (27.6)	71 (32.6)	134 (30)		
Estimated H/Hs monthly income					
< 500 ETB	56 (24.6)	37 (17)	93 (20.9)	2.19	0.534
501 to 1500 ETB	103 (45.2)	96 (44)	199 (44.6)		
1501 to 3500 ETB	64 (28.1)	73 (33.5)	137 (30.7)		
3501 to 6000 ETB	5 (2.2)	12 (5.5)	17 (3.85)		
* Indicates significant difference at p-value < 0.05					
ETB = Ethiopian Birr					

Time spent on provision of ANC in public and private health institutions

In this study, the mean (\pm SD) time spent during first ANC visit at both HF was 17.1 (\pm 7.7) minutes. At private HF the mean time spent was 19.7 (\pm 8.5) minutes where as in public HF 13.2 (\pm 3.8) minutes. During revisit, the mean (\pm SD) time spent in getting ANC at both HF was 10.3 (\pm 5.5) minutes. Meanwhile the time spent during revisit ANC private HF was 11.3 (\pm 6.6) and 9.7 (\pm 4.6) minutes in public HF.

The mean time spent on ANC provision was significantly different between public and private HF (t-test = 7.52, p-value < 0.001) that is, clients who were served in private HF have higher time spent on care than those who were served in public HF. Similarly, the mean time spent on ANC services was also found to be significantly different in first visit and revisit ANC with (t-test = 10.39, p-value < 0.001), clients who first visited have higher time spent on care than those who subsequently revisited.

Preference Of Health Care Facility For Standard Time Spent

Of the study participants, majority 316 (70.6%) knew the existence of alternative HF to attend ANC. Nearly half 218 (48.9%) of the study subjects were served in private HF while 228 (51.1%) of the study subjects were served in public HF. Their preferred choice to utilize ANC service was 198 (44.4%) in public HF and 118 (26.5%) in private HF.

Level Of Satisfaction About Time Spent During Anc

Regarding the level of clients satisfaction about time spent on ANC with health care providers respondents reported as very satisfied 62 (27.2%), satisfied 134 (58.8%) and not satisfied 32 (14%) in

public HF whereas private participants reported as very satisfied 122 (56%), satisfied 74 (33.9) and not satisfied 22 (10.1%). Among the total respondents, majority 194 (89%) from private HF reported that they would recommend to other ANC users about the time they spent with health care providers as compared with women attended public HF was 162 (71.1%).

Variables Significantly Associated With Time Spent On Anc Provision

The study analyzed the association of different variables with time spent on ANC provision. Non adjusted association was found at $p\text{-value} < 0.05$ were: residence, education, occupation, type of HF (public versus private), maternal frequency of visit, provider sex, payment for ANC services and language similarity with health care providers. However when adjusted odds ratio was calculated in multivariate logistic regression occupation, type of HF (public versus private), maternal frequency of visit and pregnant women speaks similar language with health care providers were significantly associated with time spent on ANC provision [Table 2].

Table 2

Variables significantly associated with time spent on ANC provision in Axum public and private health facilities, Axum, North Ethiopia

Variables	Time spent on ANC Standard Short		Total (N = 446)	COR (95% CI)	AOR (95% CI)
	N (%)	N (%)			
Residence					
Urban	59 (13.2)	275 (61.7)	334 (74.9)	2.46 (1.18, 5.13)*	0.79 (0.22,2.83)
Rural	9 (2.0)	103 (23.1)	112 (25.1)	1.00	1.00
Educational status					
Not attended formal education	14 (3.1)	124 (27.8)	138 (30.9)	1.00	1.00
Attended formal education	54 (12.1)	254 (57)	308 (69.1)	1.88 (1.01, 3.52)*	1.16 (0.51, 2.68)
Occupation					
Student	1 (0.2)	6 (1.3)	7 (1.6)	0.58 (0.07, 4.99)	0.36 (0.04, 3.44)
Merchant	18 (4)	70 (15.7)	88 (19.7)	0.89 (0.46, 1.72)	0.64 (0.32, 1.31)
Employee	9 (2)	82 (18.4)	91 (20.40)	0.38 (0.17, 0.85)*	0.27 (0.11, 0.63)*
Farmer	8 (1.8)	107 (24.0)	115 (25.8)	0.26 (0.11, 0.59)*	0.35 (0.09,1.37)
Daily laborer	2 (0.4)	9 (2.0)	11 (2.5)	0.77 (0.16, 3.76)	1.51 (0.2, 7.39)
House wife	30 (6.7)	104 (23.3)	134 (30.0)	1.00	1.00
Type of Health facilities providing antenatal care service					
Public-HF	19 (4.3)	209 (46.9)	228 (51.1)	1.00	1.00
Private-HF	49 (11)	169 (37.9)	218 (48.9)	3.19 (1.81, 5.62)*	2.61 (1.07, 6.33)*

N.B: 1 = Reference Category,

*Significant at p-value < 0.05

Variables	Time spent on ANC Standard Short		Total (N = 446)	COR (95% CI)	AOR (95% CI)
Frequency of ANC visit					
1st visit	49 (11.0)	151 (33.9)	200 (44.8)	3.88 (2.20, 6.84)*	3.51 (1.93, 6.37)*
Revisit	19 (4.3)	227 (50.9)	246 (55.2)	1.00	1.00
Provider sex for ANC care					
Male	46 (0.31)	186 (41.7)	232 (52.0)	2.16 (0.249, 3.73)*	0.69 (0.29,1.66)
Female	22 (4.9)	192 (430)	214 (48.0)	1.00	1.00
Payment for ANC service					
Yes	49 (11.0)	169 (37.9)	218 (48.9)	3.19 (1.81, 5.62)*	2.24 (0.94, 5.30)
No	19 (4.3)	209 (46.9)	228 (51.1)	1.00	1.00
Speak similar language with providers					
Yes	58 (13.0)	235 (52.7)	293 (65.7)	3.53 (1.75, 7.13)*	2.74 (1.23,6.12)*
No	10 (2.2)	143 (32.1)	153 (34.3)	1.00	1.00
N.B: 1 = Reference Category,					
*Significant at p-value < 0.05					

Among the socio-demographic variables occupation of the pregnant mothers was strongly associated with time spent on ANC, health care providers were 74.0% less likely to worn out standard time with pregnant mother who were governmental employee than house wife [(AOR = 0.26; 95% CI, 0.11–0.63,P = 0.003)]. Pregnant mothers who attended in private health were 2.6 times more likely to spend expanded time with care provider than who attended in public HF [(AOR = 2.61; 95% CI, 1.07–6.33, P = 0.034)].

Participants who has first visit for ANC were 3.5 times more likely to spent standard time with healthcare provider as compared to those pregnant mothers in subsequent ANC visit [(AOR = 3.50; 95% CI, 1.93–6.37, p < 0.001)]. Pregnant mothers who speak similar language with health care providers were 2.7 times more likely to spent longer time compared to who speaks different language [(AOR = 2.74; 95% CI, 1.23–6.12, P = 0.014)].

Qualitative Findings

In-depth interview with health care provider

A total of ten health professionals (key-informants), one service provider from each SDPs and three managers were included. Interviewees were six from public and four from private HF participated in the in-depth interview.

The three identified central themes that could be the reason for short time spent on care included: Health care provider's commitment, medical supplies and facilities and economical, social and cultural belief of the clients on antenatal care that affect time spent on care.

Health care provider's commitment and reasons for short time spent on ANC

Majority of the interviewer agreed that poor provider's knowledge attitude and practices, lack of provider in-service training, low staff morale, poor payments, shortages of workers, poor client provider interaction, large number of ANC attendants, and poor privacy have negative tendency on time spent during ANC service provision.

A 23 Years old health officer from public health facility said "...the time we spent with clients was short, this could be due to lack of refresher training about focused ANC components, e.g. still I have not taken any in-service training either from the government or nongovernmental organizations as a result of this, I am unable even to counsel or deliver the whole ANC component to the clients in other words omission of some services resulted in short client contact time."

Another discussant a 35 years old private provider doctor added as follows:

"...for standard time spent smart facial expression or good client provider relationship during history taking and physical examination is mandatory for pregnant women to initiating for asking and discussing their issue, failure to this most of the time we spent with clients was short. He also reported low level qualification, lack of confidentiality and privacy are the main cause for short time spent because it is the matter of knowledge and skill during history taking and physical examination that is high level qualification spends standard time to deliver their talent than low level. Besides this, if pregnant mothers believed enough confidential and privacy is secured they are more initiate for discussion their issue as a result spends enough time with us".

A 23 years old health officer from public hospital also said that *"...the time we stayed with pregnant mothers was not enough because of poor administration and pay that causes low staff morale and procedure negligence rather than providing the service based on focused ANC WHO recommended, beside to this during low attendance of the provider large number of ANC attendants waiting for service*

but the working hours are limited, so to address all clients with in that short working hours we obligate to shorten each patient contact time”

Medical supplies or facilities and reasons for short time spent on ANC

Key informants in all HF agree that unavailable and non functional medical equipments are some of the factors that affect time spent during service delivery.

One reason for short client contact time given by a 25 yrs old midwife from public health center was “... *sometimes shortage and not functioning of medical equipments happened e.g. sphygmomanometer, as that time I am wasting my working hours here and there to find out the sphygmomanometer rather than investing the time with clients as a result large number of pregnant mothers forced to wait me to get the service and I am hurrying in each client contact time to address all the clients which was main cause of short time spent on care.*”

Economical, social and cultural belief of the clients that affect time spent on ANC

All of the key informants reported that rural residence, low income, Muslim religious, low educational status, clients’ shyness and hurry were believed to be negatively affect the time spent during service delivery.

A 38 yrs old private provider (gynecologist) and 30 yrs old public provider discussant stated their experience the reason for short time spent was “*these clients having low income coming for service faced with short contact time than this high income the reason was omission of some services or procedures for example ultra sound for those unable to pay. Besides, pregnant mothers living in rural and low educational status are less likely cooperative to discuss with us about their issue and muslin–religious mothers when we asking for physical examination they do not want to expose their body, so we are obliged to omit some procedures than their counter parts as a result of this we are declining the time stay with each clients.*”

Discussion

Majority 378 (84.8%) of pregnant mothers were served below the mean standard time in both public and private HF. the mean (\pm SD) time spent for first ANC provision in private was 19.7 (\pm 8.5) minutes, higher as compared to 13.2 (\pm 3.8) minutes in public HF.

The study revealed that type of HF (public Vs. private), maternal frequency of visit and pregnant women who speak similar language with health care providers were found to be significant predictors for time spent on provision of ANC.

Type of HF (Public vs. Private) was found to be significant predictor for time spent on provision of ANC, which means pregnant mothers who attended public HF had significantly shorter time spent than those who attended private HF. This is demonstrated by the study conducted in Gambia that the mean time

spent at public and private HF were (3.7 vs. 6.6 min.) [7] and in Pakistan (4 vs. 5–8 min.), respectively [13]. The possible explanation for such variations could be; public health providers are less likely to be motivated with incentives compared to the private sector and shortages of functioning equipment. However, private providers generally face greater incentives which initiates efficient client-friendly service provision, experienced shorter waiting times and spent standard time with their clients, availability of qualified staff and functioning equipments. This was also concurrent with the study conducted among public and private HF in Tanzania, Kenya and Ghana comparative analysis of measuring client satisfaction [14], and from the qualitative part of this study (provider's in-depth interview) which stated that, the reason for short time spent was provider's poor knowledge, attitude and practices, low staff morale and shortages of supplies and non-functioning equipment was stated by the key informants.

Maternal frequency of ANC visit was also found to be strongly associated with time spent during ANC was also significantly different in first and revisit ANC. This finding was consistent with suggested SCT for visit and revisit time spent was 20 minute and in line with study conducted in Burkina Faso, Uganda and Tanzania [5, 10, 15]. This can be explained by the fact that, health care providers failed to perform all procedures stipulated by WHO guideline based on FANC model at each visit, beside to this basic activities done in first visit may not perform in subsequent visit logically for instance registration (name, age, sex, gravid, Para and address), physical examination, laboratory investigations (RPR, Rh factor, hemoglobin level).

Respondents who speak similar language with the health care provider during care have also a predictor variable for time spent on provision ANC. This was similar with studies done in USA [12]. This can be explained by the fact that language differences was known to be a barrier for effective communication, that is, in the absence of comprehension and effective communication the provision of health care ends with short client contact time because the clients cannot understand the clinician's medical jargon or complex instructions or proceeds only with errors, and risks to client's safety. And as it was stated in the qualitative findings, it may lead pregnant women's faced difficulties to reach in decision and even refuse the service at all.

Limitation

The limitation of this study might be study participants' from private health facilities provide their maternal care services at evening as par time of their governmental work. As a result study participants and the key informants were in hurry to give adequate information to get deep information. So, there might be information bias.

Conclusion

This study revealed that majority of pregnant mothers utilized ANC services below the standard time (< 20 minutes) in both HF. the mean time spent on provision of ANC with health care providers at the public HF was significantly shorter than the time spent with providers at the private HF. Type of HF (public versus

private), frequency of ANC visit and pregnant women who speak similar language with health care providers were identified as predictors of time spent for ANC provision. To reduce maternal mortality and complication, efforts targeted at standard provision of ANC standard with standard provider client contact time should be addressed.

Acronym

ANC Antenatal Care

EDHS Ethiopian Demographic and Health Survey

FANC Focused Antenatal Care

HF Health Facility

OR Odds Ratio

PCT Patient Contact Time

SCT Client Standard Contact Time

SD Standard Deviation

SDPs Service Delivery Points

SPSS Statistical Package for Social Sciences

WHO World Health Organization

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the Institutional Review Board (IRB) of College of Health Science, Mekelle University with reference number MU/CHS/RCS/215/2015. The letter of support was given from regional health bureau to respected health facilities. Respondents were given information about the objectives of the study and they have the right to participate or decline in the study and able to withdraw from the study at any time. Both written and verbal consent was obtained from the respondents before data collection. For minors (age less than 16 years) informed assent and consent was obtained from their guardians. To keep confidentiality data was analysed anonymously. The written consents and assents were kept confidential and no one was allowed to access except the principal investigators.

Consent for publication

Not applicable

Availability of data and materials

Datasets obtained or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors have declared that no competing interests exist

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Authors' contribution

NGN: drafted the proposal. **NGN, HBA and MTT:** designed the study, conducted data analysis, interpretation of findings and manuscript preparation. All authors read and approved the final manuscript for publication.

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