Quality Of Antenatal Care and Associated Factors Among Pregnant Women Attending Public Health Facilities in Dilla Town, Southern Ethiopia, 2024

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Submission: July 08, 2025; **Published:** July 29, 2025

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Abstract

Background: Antenatal care refers to the care provided by skilled healthcare professionals to pregnant mothers, aimed at ensuring optimal health for both the mother and the baby throughout the pregnancy period. It promotes a basis for health promotion, risk identification, prevention and management of pregnancy-related illnesses to avoid health problems in both the fetus and mother. Quality ANC consists of delivering essential services to every pregnant woman and her fetus, while also providing more specialized care for those who need it.

Methods: A facility-based cross-sectional study was carried out from November 1 to November 30, 2024, involving 406 pregnant women who were attending ANC at a public health facility located in Dilla Town. Data collection was performed using a structured questionnaire along with an observational checklist. The study participants in the study were selected through a systematic random sampling method. Trained data collectors conducted exit interviews. The collected data were entered into EPI Data version 3.1 and subsequently analyzed using SPSS version 26. Both bivariable and multivariable logistic regression analyses were employed. The results were presented as adjusted odds ratios (AOR) with 95% confidence intervals (CIs). A p-value of less than 0.05 was used to declare statistical significance in all inferential analyses conducted in this study.

Result: This study indicated that about 52% (95% CI: 51.5%–52.5%) of pregnant mothers had received quality ANC services. The frequency of ANC visits and satisfaction with the ANC services were significantly associated with the quality of the ANC service provided. Pregnant women who attended a second visit or more had 2.2 times greater odds of receiving good-quality ANC compared to those who only attended their first ANC visit (AOR = 2.24, 95% CI: 1.43–3.51). Furthermore, participants who are satisfied with the ANC service had about 6.2 times higher odds of receiving quality ANC in comparison to those who were dissatisfied (AOR = 6.21, 95% CI: 3.48–11.08).

Abbreviations: ANC: Antenatal care; AOR: Adjusted odd ratio; COR: Crude odd ratio; MMR: Maternal mortality rate; STI: Sexual transmitted infection; WHO: World Health Organization.

Keywords: Quality of ANC; Pregnant women; Factors associated

Introduction

Antenatal care (ANC) refers to the care provided by skilled healthcare professionals to pregnant mothers, aimed at ensuring optimal health for both the mother and the baby throughout the pregnancy period. It promotes a basis for health promotion, risk identification, prevention and management of pregnancy-related diseases to avoid health problems in both the fetus and mother [1]. Quality ANC consists of delivering essential services to every pregnant woman and her fetus, while also providing more specialized care for who require it. It is the most important issue to achieve the Sustainable Development Goals (SDGs) related to maternal health [2].

The World Health Organization (WHO) introduced a standard guideline for ANC that recommends a minimum of eight ANC contact sessions. It involves documenting medical history, providing pregnancy advice, evaluating personal needs, conducting various

laboratory tests (HIV testing, urine analysis, blood type and Rh factor, and stool tests), conducting physical examinations, self-care education, and recognizing health conditions that may be harmful during pregnancy, along with initial treatment and referral services when necessary. Additionally, it advises that individuals should receive at least two tetanus toxoid vaccinations, and consume iron and folic acid supplements for at least 90 days [3].

The maternal mortality rate continued to be unreasonably high worldwide. About 95% of maternal deaths took place in low and middle-income nations, and the majority of these deaths were avoidable [4,5]. Ethiopian demographic and health survey 2016 report estimated that there were 412 maternal deaths for every 100,000 live births, 62% of women received ANC from a skilled provider and 19% made four or more ANC visits [6]. This highlights the critical need for targeted interventions to address this serious problem. Preventing maternal mortality and improving maternal health depend on the provision of quality ANC [7,s8]. About 25% of maternal deaths worldwide happen during pregnancy [9]. It is possible to prevent 28% of maternal deaths by improving the quality of ANC provided to pregnant mothers who seek care in health facilities [10]. It seems that much more work needs to be done to address maternal healthcare service [11]. The quality of services plays a crucial role in the ANC outcomes of low-quality care is affected by various factors [12].

The SDGs aim to ensure universal access to high-quality sexual and reproductive health care services and to reduce the maternal mortality ratio to below 70 per 100,000 live births by the year 2030. Provision of quality ANC services necessitates the availability of appropriate infrastructure, well-trained healthcare professionals, infection prevention measures, diagnostic tools, necessary supplies and essential drugs. Also, the quality of ANC services can be highly affected by length of waiting times, providers interactions, and approach styles. Therefore, the purpose of this study was to assess the quality of ANC and associated factors among pregnant women visiting a public health facility in Dilla town, Southern Ethiopia, 2024.

Methods and Materials

Study area and period

The study was carried out in Dilla town, Southern Ethiopia, approximately 359 km from the capital Addis Ababa, along the route to Moyale. The town's estimated total population was 125,067. The town equipped with 1 referral hospital, 2 public health centers, 10 private clinics, 1 government pharmacy, and 12 private pharmacies. The three public health facilities offer regular ANC services to pregnant mothers, along with other maternity services. Data collection occurred from November 1 to November 30, 2024, across the three public health facilities.

Study Design

• Facility based cross sectional study

Source and study Population

Source Population

• All pregnant women who visit public health facilities for ANC services.

Study Population

• Randomly selected pregnant women who visit public health facilities for ANC services.

Eligibility Criteria

Inclusion Criteria

• All pregnant women who visit public health facilities for ANC service in Dilla town during the data collection period.

Exclusion Criteria

• All pregnant women who could not give informed consent (mentally impaired and critically ill) were excluded from the study.

Sample size calculations

The sample size was calculated by using a single population proportion formula by considering the following assumptions: 41.2% of pregnant women had received good quality ANC services in public hospitals in Sidama Region [13], 5% margin of error, 95% confidence level (1.96) and 10% for possible non-response rate.

$$n = \left(\left[\left((Z\alpha/2) \right) \right] \wedge 2 P(1-P) \right) / d \wedge 2$$

$$n = \left(\left[\left((1.96) \right) \right] \wedge 2 \ 0.41(0.59) \right) / \left[\left((0.05) \right) \right] \wedge 2$$

n = 369

Finally, 10% was added for compensating possible non-response rate. The total sample size was estimated to be 406.

Sampling Methods

The study included the three public health facilities that offer ANC services in Dilla town. By using the previous months ANC flow of pregnant women as a baseline, there were a total of 958 pregnant women visited those public health facilities (481 Dilla University Referral Hospital, 247 Haroresa Health Center, and 230 Oddaya Health Center) who fulfilled the eligibility criteria of the study. The number of pregnant women interviewed at each health facility was determined based on proportionate allocation to size. The interval (K) was calculated by dividing 958 by the sample size of 406, resulting in 2 intervals. The lottery method was employed to select the first participant for the study at each health facility. Subsequently, every other pregnant woman was interviewed, and a file checkup was conducted.

Data collection and quality control

Data were collected using structured questionnaires which are prepared by reviewing different literatures relevant to address the study objectives. Relevant experts reviewed the data collection

tool to ensure it aligned with the study objective. The data was collected through exit interviews, document reviewing and an observational checklist. The data collection tool was pre-tested on 5% of the sample at the Wonago health center one week prior to the data collection. Three nurses were appointed as data collectors, along with one health officer serving as the supervisor. One-day training was provided on the study purpose, data collection tool, and data handling and maintaining respondent's confidentiality.

Data analysis and processing

The collected data were coded, cleaned and entered in to a computer using EPI-DATA 3.1 and exported to the SPSS version 26 windows program for further analysis. Bivariable logistic regression was employed to identify candidate variables for multivariable logistic regression with a significance level of ≤ 0.25. Variables showing a p-value of < 0.05 in the final model were considered statistically significant. Both the crude odds ratio (COR) and adjusted odds ratios (AOR) along with their respective 95% confidence intervals (CI) were used to assess the strength of the association. The assumptions of logistic regression were checked before the final multivariable analysis.

Operational Definition

- **Quality of ANC**: - It is a binary variable and set as 1 if the respondents had received all six essential ANC components and 0 unless. These components included checking blood pressure, blood and urine tests, being informed about potential complications, nutritional counseling, and advice on birth preparedness plan [14].

- **Maternal satisfaction**: It is individual perception of service that might be interpersonal relationships, short waiting time, information and education, privacy and confidentiality, cultural sensitivity, or emotional support.

Ethical consideration

Ethical clearance was obtained from the Institutional Research Ethical Review Committee (IRERC) at Pharma College School of Graduate Studies. Permission letters were acquired from the Dilla town health department, and formal letter was written to each healthcare facilities. Informed verbal consent was obtained from each study participants to confirm their willingness to participate after explaining the objective of the study. Participants were guaranteed that their responses would remain confidential from both data collectors and supervisors. The data collected was solely used for study purposes.

Result

Socio-demographic characteristics

A total of 406 expectant mothers were planned to be interviewed; however, 402 interviews were carried out, resulting in a response rate of 99%. The mean age of the participants was 26.36 (±4.8) years. The majority, 377 (93.8%), were in a married, and approximately two-thirds, 294 (73.1%) of them lived in a large family (> 4 members). Approximately a quarter 101 (25.1%) of the respondents was housewives. Around two-thirds, 270 (67.2%), of the pregnant women had a household income more than 3000 ETB (Table 1).

Table 1: Socio-demographic and economic characteristics of the respondents in Dilla town, Southern Ethiopia, 2024.

Variables	Frequency (n)	Percentage (%)
Age in years (N=402)		
18-24	154	38.3
25-34	131	32.6
≥35	117	29.1
Residence (N=402)		
Rural	45	11.2
Urban	357	88.8
Marital Status (N=402)		
Married	377	93.8
Divorced	11	2.7
Widowed	6	1.5
Single	8	2
Education (N=402)		
Non formal	35	8.7
Primary	175	43.5
Secondary	118	29.4
College and above	74	18.4
Family income in ETB (N=402)		
≤3000	132	32.8

>3000	270	67.2
Religion (N=402)		
Protestant	273	67.9
Orthodox	95	23.6
Muslim	24	6
Other	10	2.5
Occupation (N=402)		
Merchant	119	29.6
Housewife	101	25.1
Private employer	92	22.9
Government employer	66	16.4
Student	24	6
Educational status of partner (N=402)		
No formal	80	19.9
Primary	114	28.4
Secondary	122	30.3
Diploma and above	86	21.4
Partner occupation (N=402)		
Merchant	147	36.6
Gov't employer	69	17.2
Private employer	131	32.6
Farmer	38	9.5
Daily laborer	17	4.2
Family size (N=402)		
⩽4 members	108	26.9
>4 members	294	73.1

Obstetric history of respondents

The majority of 296 (73.6%) respondents had a previous history of pregnancy. Regarding birth interval, 188 (64.2 %) responded that they had more than 2 years for last birth. All respondents had information on the importance of ANC follow up, with health professionals being the primary source of information on ANC for 68.9% of them. About 236 (58.7%) of the respondents initiated their initial ANC visit in the first trimester of pregnancy. Nearly two-thirds 261 (64.9%) of the study participants had two or more ANC visits (Table 2).

Table 2: Obstetric characteristics of respondents, Dilla town, Southern Ethiopia, 2024.

Variables	Frequency (n)	Percentage (%)
Number of pregnancy (Gravidity) (N=402)		
1	106	26.4
≥2	296	73.6
Number of live birth (N=402)		
0	109	27.1
≥1	293	72.9
Complications in prior pregnancy (N=296)		
Yes	20	6.8
No	276	93.2
History of abortion (N=296)		
Yes	14	4.7
No	282	95.3

Received ANC in prior pregnancy (N=296)		
Yes	271	91.6
No	25	8.4
Birth interval from last normal delivery (N=293)		
≤2	105	35.8
>2	188	64.2
Number of ANC visit (N=402)		
1	141	35.1
≥2	261	64.9
First ANC visit timing (N=402)		
First trimester	236	58.7
Second trimester	106	26.4
Third trimester	44	10.9
Fourth trimester	16	4
Reasons for ANC visit (N=402)		
Fetal health	126	31.3
Maternal health	55	13.7
Maternal and child health	221	55
Information source (N=402)		
Health professionals	277	68.9
Friends or Relatives	106	26.4
Other	19	4.7

Healthcare facility related factors

Nearly half, 193 (48%) of the participants had to wait more than an hour to get the service. Majority, 379 (94.3%), of the respondents were treated with respect by the provider on their latest visit. About three-quarters, 301 (74.9%) of the respondents were satisfied with the service they received from the healthcare facility. All respondents were appointed for the subsequent visit. Among the study participants, 255 (63.4%) needed to improve the service delivery to get a better ANC service (Table 3).

Table 3: Healthcare facilities related characteristics, Dilla town, Southern Ethiopia, 2024.

Variables	Frequency (n)	Percentage(%)
Care provider (N=402)		
Medical doctors	50	12.4
Midwife	180	44.8
Nurse	153	38.1
Other	19	4.7
Anyone else besides the caregiver present? (N=402)		
Yes	320	79.6
No	82	20.4
Waiting time (N=402)		
>1 hr	193	48
≤1 hr	209	52
Return to your home without receiving service (N=402)		
Yes	25	6.2
No	377	93.8
Respectful treatment (N=402)		
Yes	379	94.3
No	23	5.7

Advice on Nutrition (N=402)		
Yes	340	84.6
No	62	14.4
Advice on place of delivery (N=402)		
Yes	376	93.5
No	26	6.5
Advice on Danger Sign (N=402)		
Yes	338	84.1
No	64	15.9
Advice on HIV/STD (N=402)		
Yes	282	70.1
No	120	29.9
Advice about new born care (N=402)		
Yes	317	78.9
No	85	21.1
Satisfaction by advice (N=402)		
Yes	301	74.9
No	101	25.1
Satisfaction level (N=301)		
Satisfied	202	67.1
Very satisfied	99	32.9
Preferred place for birth (N=402)		
Here	329	81.8
Other health facility	53	13.2
Home	20	5
Why did you chosen this organization to give a birth? (N=329)		
It is near to my house	33	10
Good Health care service	278	84.5
I usually give birth here	18	5.5
Why did not give delivery this organization? (N=73)		
Poor service delivery	49	60.9
Treat respectfully	12	16.4
Long waiting time	12	16.4
Which part need improvement? (N=402)		
Health care provider	57	14.2
Supplies and Infrastructures	90	22.4
Service delivery	255	63.4
Did you think that you received quality ANC service? (N=402)		
Yes	344	85.6
No	58	14.4

Service provision related factors

A comprehensive physical examination was a fundamental component of quality ANC services, with assessments of blood pressure (95.5%), weight measured (96.8%), evaluation of pallor (96.3%), assessment of edema (96.5%), and ultrasound performed (33.6%) as part of the comprehensive physical examination. In the routine laboratory tests, the CBC test (particularly Hgb) was conducted (76.4%), VDRL (71.1%), blood group/RH factor (72.6%), urine analysis (68.7%), and HIV test (96.3%). About 343 (85.3%) and 382 (95%) of the study participants acknowledged receiving iron supplementation and tetanus immunization, respectively (Table 4).

Table 4: Service provision related characteristics, Dilla town, Southern Ethiopia, 2024.

	Frequency (n)	Percentage (%)
Weight measured (N=402)		
Yes	389	96.8
No	13	3.2
Pallor evaluated (N=402)		
Yes	387	96.3
No	15	3.7
BP measurement (N=402)		
Yes	384	95.5
No	18	4.5
Edema evaluates (N=402)		
Yes	388	96.5
No	14	3.5
Ultrasound (N=402)		
Yes	135	33.6
No	267	66.4
CBC (Specially Hgb) test (N=402)		
Yes	307	76.4
No	95	23.6
VDRL (N=402)		
Yes	286	71.1
No	116	28.9
Blood group/RH factor (N=402)		
Yes	293	72.6
No	110	27.4
Urine test (N=402)		
Yes	323	68.7
No	79	31.3
HIV test (N=402)		
Yes	387	96.3
No	15	3.7
Iron supplementation (N=402)		
Yes	343	85.3
No	59	14.7
Tetanus immunization (N=402)		
Yes	382	95
No	20	5
Syphilis Positive and treated (N=402)		
Yes	14	3.5
No	388	96.5

Observational checklist

The observational checklist had 15 questions with 4 options to choose from (1 for very poor, 2 for poor, 3 for satisfactory, and 4 for excellent). The first two choices (very poor and poor) indicated tasks were not performed correctly, while the latter two (satisfactory and excellent) indicated tasks were carried out correctly.

About 30 study participants' service provision and care provider approaches were assessed by taking 10 study participants from each health facility. Most individuals were not greeted and called by their names appropriately upon arrival. There were no washing facilities (water, soap, and towels) were available for pregnant women at the healthcare facility. The majority of healthcare pro-

viders accurately measured the patients' pulse rate, blood pressure, and temperature. It was noted that most respondents' gestational age, expected date of delivery and progress of pregnancy were correctly recorded.

Reviewing clinical documents before starting the session and checking about previous medical and obstetric history was properly done for all respondents. Nearly all participants were informed about risks of consuming unauthorized medications during pregnancy, advised on danger sign and place of birth.

Factors associated factors with the Quality of ANC

In bivariable logistic regression analysis variables such as current number of ANC visits, waiting time, satisfaction with ANC service and respectful approach were variables associated with dependent variables at p-value ≤ 0.25. After controlling the effect of confounding factors in multivariable analysis, variables such as number of ANC visits and satisfaction with ANC service were found to be significantly associated with the quality of ANC service at p-value <0.05.

The likelihood of getting quality ANC service was 2.2 times greater for pregnant mothers with a second visit or more (AOR = 2.24, 95% CI: 1.43–3.51). Those who are satisfied with the ANC service had about 6.2 times higher odds of receiving quality ANC service (AOR = 6.21, 95% CI: 3.48–11.08) (Table 5).

Table 5: Factors associated with ANC quality among pregnant women visiting public health facilities in Dilla town, Southern Ethiopia, 2024.

Variables	ANC quality		COR (95% CI)	AOR (95% CI)	P-value
	Good	Poor			
Number of ANC Visit					
1	59	82	1	1	
≥2	150	111	1.88(1.24-2.84)	2.24(1.43-3.51)*	0
Waiting time					
≤1hr	119	90	1.5(1.02-2.24)	1.38(0.90-2.12)	0.138
>1hr	90	103	1	1	
Satisfaction with ANC service					
Yes	187	114	5.89(3.48-9.97)	6.21(3.48-11.08)*	0
No	22	79	1	1	
Respectful approach					
Yes	204	173	4.20(1.53-11.53)	1.19(0.383-3.69)	0.763
No	5	18	1	1	

Discussion

Facility based cross-sectional study was carried out to assess the quality of ANC and associated factors among pregnant women visiting public health facilities in Dilla town, Southern Ethiopia. This study revealed that 52% (95% CI: 51.5%–52.5%) of pregnant women had received good-quality ANC services, which was comparable with findings presented by studies conducted in Chenchass district, Southern Ethiopia (52.4%) [15] and Bahir Dar, Ethiopia (52.3%) [16]. Several studies conducted in different parts of the world, Southern Ethiopia (41.2%) [13], Northern Ethiopia (41%) [17], Northwest Ethiopia 32.7% [18], Eastern Ethiopia (24.3%) [19], Nepal (42%) [20] and Zambia (29%) [21] reported a lower prevalence of quality ANC than the present finding. In contrast to this, studies carried out in different parts of the world, South Ethiopia (69.1%) [12], Southwest Ethiopia (60.4%) [22], Bishoftu Central Ethiopia (84.9%) [23] and Malaysia (63%) [24] reported a higher prevalence of quality ANC utilized by pregnant women. These discrepancies might be related to differences in sociodemographic characteristics study participants, ANC quality measurement methods, availability of trained health professionals, approach of healthcare provider and study setting.

The odds of getting quality ANC increased by 2.2 times among women who had two or more ANC visits as compared with their counterparts (AOR=2.24; 95% CI: 1.43-3.51). This finding was consistent with studies done in Ethiopia, Northwest Ethiopia, Southern Ethiopia [25], Southern Ethiopia and Nigeria [26]. The possible reason might be that frequent exposure to ANC services might enhance the familiarity of women with the services and encourage them to freely share information with healthcare providers. This study showed that pregnant women who are satisfied by service provision had 6.21 times higher odds of quality ANC service compared with their counterparts (AOR=6.21; 95% CI: 3.48-11.08). This finding was consistent with studies done in Ethiopia, Addis Ababa, Ethiopia [27], Southern Ethiopia, Southwest Ethiopia, Northwest Ethiopia, and West Ethiopia [28]. The possible explanation might be that satisfaction with ANC services might come from healthcare providers' approach, laboratory investigation, physical examination, and advice given service provider.

Limitation

This study was aimed at determining the quality of ANC and associated factors among pregnant women attending public health facilities. However, the study was not free from some lim-

itations. This study was urban health facility-based; therefore, it might not be possible to generalize the findings to the entire pregnant women of the rural health facility. The study used only quantitative methods, if it was triangulated with qualitative data strong evidence could be generated.

Conclusion

This study showed that only half of the pregnant women get quality ANC service in public health facilities, which indicate that pregnant mothers who received quality ANC is low, and more effort is required. Different factors contributed to quality of ANC services, including number ANC visit and satisfaction with ANC. This study provides valuable indications about the areas that should be focused on to promote the quality of ANC service for pregnant mothers. Also, the country is still far from achieving universal coverage of recommended ANC content.

Data sharing statement

The data used to support the findings of this study are available from the corresponding author upon request.

Acknowledgments

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