

# Quality of Antenatal Care in Selected Public Health Facilities of West Ethiopia

Markos Desalegn Beyene (✉ [markosdesalegn@gmail.com](mailto:markosdesalegn@gmail.com))

Department of public health, Institute of health sciences, Wollega University, Nekemte, West Ethiopia

**Amanuel Nemomsa**

Wollega University

**Desalegn Wirtu**

Wollega University

**Motuma Getachew**

Wollega University

**Gemechu Kejela**

Wollega University

**Emiru Merdassa**

Wollega University

**Workineh Diriba**

Jigjiga University

---

## Research

**Keywords:** Antenatal care, service, Quality, West Ethiopia

**Posted Date:** April 5th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-383795/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**Background:** Ante natal care is a key entry point for a pregnant woman to receive a broad range of promotion and preventive health services.

**Objective:** was to assess the quality of antenatal care services at public health facilities of western Ethiopia.

**Methods:** Facility-based cross-sectional study was conducted from May 30th to June 30th, 2016. All public health facilities in the zone were audited, 316 medical records were reviewed, and 316 pregnant women were interviewed. The data was entered using EPI Data version 3.1 and analyzed using SPSS version 20.0. Descriptive statistics, binary, and multiple logistic regressions were conducted. Variables with a P-value of  $<0.05$  were considered as statistically significant predictors of the outcome variable.

**Results:** A total of 316 pregnant women were enrolled in the study. All facilities were categorized as "good" by the possession of necessary equipment, 3/4 by basic amenities and 87.34% by general and gynecologic examination. The information was provided for 222(86.21%), which is categorized as poor. 252 (79.7%) of the women were satisfied with ANC. A urine sample taken during ANC visit AOR 3.36(1.70, 6.61) and counseling on food eaten during pregnancy AOR 2.27(1.16, 4.45) were predictors of client satisfaction on ANC.

**Conclusions:** The majority of pregnant women were satisfied with the ANC they received. A urine sample taken during the ANC visits and being counseled on the types of food eaten during pregnancy were predictors for client satisfaction on ANC. Concerned bodies need to improve laboratory tests and information provision.

## 1. Background

According to the World Health Organization (WHO), Antenatal care (ANC) is the care that a woman receives during pregnancy, that helps to ensure healthy outcomes for women and newborns. It is a key entry point for a pregnant woman to receive a broad range of promotion and preventive health services. To achieve its objectives, providing quality ANC for pregnant women is crucial. However, as evidences indicate, the quality of ANC is poor in almost all developing countries (1).

In Ethiopia, as in most developing countries, quality improvement efforts are slow and scattered. In the country, only 41% of women received antenatal care once in their course of pregnancy and one in every four women reported that they were informed of signs of pregnancy complications during their ANC visit, 67 % had a blood sample taken, 52 % had a urine sample taken, 71% had their blood pressure measured and only 34 % took the iron tablet and only 16% of pregnant women gave birth by skilled providers (2). In Ethiopia, pregnant mothers attending ANC clinics were found to receive only part of recommended care components and almost half (47.7%) of the study women were not satisfied and a large proportion of

mothers are missing opportunities to receive screening (like blood pressure and weight measurements) and preventive components of antenatal care (iron/folic acid supplementation) (3).

The new approach to ANC emphasizes the quality of care rather than quantity (4). However, studies have shown that there are many missed opportunities for care, both because of the client- and health system-related factors. Mothers and children may face risks because of limited or close to term ANC visits, low-quality care during visits due to poor provider training, infrastructure and administrative weakness at facilities, complications of existing conditions such as TB, malaria, anemia, or sexually transmitted infections (STIs), and short intervals between births (5).

Even though the quality of ANC practice is one of the important strategies to reduce maternal and newborn morbidity and mortality, the study conducted to assess the quality of ANC practice in Ethiopia is limited in number. The frequency of ANC visit alone is not an end to save the lives of the mothers and newborn unless the mothers can receive the quality ANC to the level of the standards.

Therefore, this study assessed the level of quality of ANC in public health facilities of Kellem Wollega Zone. The result of the study can be used to increase the client satisfaction with ANC services from public health facilities.

## **2. Methods**

### **2.1. Study Design, area and Period**

A facility-based cross-sectional study was conducted in public health facilities of Kellem Wollega Zone, western Ethiopia from May 30 to June 30, 2016. Kellem Wollega zone is one of the eighteen zones of Oromia Regional State. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this Zone has a total population of 797,666, of which 401,905 are men and 395,761 are women. By residence, 76,277 (9.56%) of the population are urban inhabitants. A total of 159,353 households were counted in this Zone, which results in an average of 5.01 persons per household (6). According to the 2015/2016 district based plan, there are about 34,470 of women expected to be pregnant in the year in the zone by conversion factors. Forty-five Health Centers and one zonal and one district hospital are currently providing ANC services in this zone.

### **2.2. Population and eligibility criteria**

All pregnant women, who were attending ANC clinic, all health facilities, all facilities' heads, and all ANC providers working at the public health facilities in the Kellem Wollega zone, were the source population. Selected health facilities, pregnant women attending ANC clinic at the selected health facilities, heads of the health facilities, and ANC providers who were providing the service at the selected public health facilities in Kellem Wollega Zone were the study population. Pregnant women who were seriously ill, with a mental health problem and hearing impairment were excluded from the study. In addition, ANC service

providers with less than six months of working experience in selected facilities were excluded from the study.

## 2.3. Sample size determination

Sample size was determined using single population proportion formula, by considering the proportion of satisfied pregnant women from study done in Ambo town which was 89% (7), marginal of error of 5%, and confidence level of 95%.

After multiplying the calculated sample size by 2 for design effect and adding 5% for non-response rate, the final sample size becomes 316 pregnant mothers.

## 2.4. Sampling procedure

There are ten districts in the Kellem Wollega zone. Seven of them were selected by a simple random sampling technique using the lottery method. One health center was selected from each district and the lottery method was used when more than one facility exists in the district. DembiDollo Hospital was selected from the two public hospitals in the zone. The total calculated sample size was proportionally allocated to each health facility according to the number of attendants of the recent quarter ANC report. Finally, pregnant women who were registered and attending the antenatal care service during the data collection period were taken consecutively until the required sample size from the specific facility was fulfilled.

## 2.5. Data collection tools and procedures

A structured questionnaire was adapted from the Safe Motherhood Needs Assessment package to obtain information on services received by pregnant women during exit interviews (30). Satisfaction level was measured by 12 items of questions prepared to measure the level of satisfaction, adopted from similar studies conducted in the country. Satisfaction level with a Likert scale of 1 to 5 score and the mean satisfaction score was used as a cut-off point.

A checklist for client medical review was adopted as per the Ethiopian Federal Ministry of Health integrated cards of ANC, labor, delivery, newborn, and post-natal care.

Eight clinical nurses and two MPH holder supervisors were selected from facilities that were not included in the study. Two days of training were given for data collectors and supervisors on data collection techniques and all data collection tools. The data collectors conducted client exit interview and review of medical records.

**Client exit interview:** Clients were interviewed after they finished the whole process of antenatal care services at the exit area.

Data collectors reviewed all respondents' medical records including the types of services clients received during their ANC visit on daily basis for all interviewed pregnant women. The attributes of output and some parts of process components of ANC quality were assessed from the client interview.

**Facility audit:** All selected facilities were audited to assess the health facilities' capacity to deliver ANC services.

The components for structural aspects of ANC quality (Management system, Basic amenities, Infection prevention materials, ANC Diagnostic equipment, Laboratory equipment, and Essential drugs) were obtained from the audit.

**Medical record review-** A medical recording number was written on individual questionnaires to differentiate client medical records. Medical record review was done using a checklist adopted as per the Ethiopian Federal Ministry of Health integrated cards of ANC, labor, delivery, newborn and postnatal care service. The most components for process aspects of ANC quality (General, gynecological examination, and routine ANC tests done, drugs, and information given for pregnant women) were assessed.

## 2.6. Operational Definitions

**Quality of ANC services:** Based on Donabedian's quality of care framework, this study assessed three aspects of the quality of care: structure, process, and outcome.

**Structural aspects of the quality:** Management system, basic amenities, infection prevention facilities, diagnostic equipment, laboratory equipment, and essential drugs were components used to assess the structural aspects of the quality. The data for structural aspects of the quality were collected from facility audits.

**Management system:** Availability of trained ANC providers, mechanisms to obtain client opinion on service provided, and supervision visits from the external body within the past six months.

**Basic amenities:** Basic amenities assessed in this study for ANC service include a waiting area, private room for ANC, chair, electricity, and toilet, generator, and ambulance service. The availability and functionality of these basic amenities were checked at each facility during the facility audit.

**Infection prevention materials:** Availability of water sources, soap for hand washing, sterilizer, waste disposal bin, sharp container, latex glove, disinfectant, and antiseptic solutions at ANC room or in the facilities during facility audit.

**Diagnostic Equipment:** The diagnostic equipment for ANC services assessed in this study were, Gynecological examination light, examination couch, blood pressure measuring apparatus, stethoscope, fetoscope, adult weighing scale, Thermometer, vaginal speculum, and Tape meter. The Diagnostic equipment was assessed by checking their availability and functionality at the ANC clinic during a facility audit.

**Laboratory equipment:** The laboratory equipment assessed for ANC in this study include Microscopy, urine container, urine dipstick, test for Hgb or HCT, test for syphilis, and HIV test kits. All facilities were assessed for laboratory equipment during the facility audit.

**Essential drugs:** The drugs assessed as essential for ANC services include Tetanus toxoid, Iron, ARV, and Mebendazole. The facilities' essential drugs were assessed by checking during a facility audit.

**Process aspects of quality:** Both the interpersonal and technical aspects of quality were assessed under the process of quality services.

**Interpersonal aspects** include client waiting time, client-providers' interaction, privacy, and confidentiality of clients.

**The technical aspects of quality** were determined by assessing the completeness of the ANC consultation process for each pregnant woman included in the study. General and gynecological examinations are done, Laboratory tests are done, Drugs are given and Information provided for pregnant women during consultation time was parameters used to assess the completeness of the ANC consultation process.

These parameters were adopted from integrated cards of ANC, labor, delivery, newborn and post-natal care which were developed by the Ethiopian Federal Ministry of Health and WHO recommendation. Data for these parameters were obtained from medical record reviews and client exit interviews.

**General and gynecological examination done:** General and gynecological examinations done for clients were assessed by checking twelve elements of examination listed here. Gestational age, Weight, Blood pressure, Pallor, Jaundice, Chest abnormality, Heart abnormality, Vulvar ulcer, Vaginal discharge, Pelvic mass, Cervical lesion and Fetal Heart sound (gestational age greater than 16 weeks) checked and recorded on client medical records.

**Routine ANC laboratory tests are done:** Routine ANC tests done for clients were assessed by checking if, Hemoglobin or hematocrit, Urine for Protein, Urine for infection, VDRL, HIV, Blood group & Rh factor done and recorded on client's medical record.

**Drugs are given:** Drugs given for pregnant women were assessed by checking if Iron supplementation, TT vaccine, and Mebendazole were given during any of their visits. The data about Iron Supplementation was asked from the client interview and the rest were checked from clients' medical records.

**Information provided to pregnant women:** Information provided for the pregnant women on recognizing danger signs during pregnancy and delivery, the importance of Birth Preparedness and Complication Readiness, places of delivery, type's food to eat during pregnancy, exclusive breastfeeding, HIV testing during pregnancy, using Insecticide Treated Net and importance of postpartum family planning were assessed by clients exit interview.

**Outcome aspects of quality:** The Outcome aspects of quality were assessed by the level of client satisfaction with ANC service they received which was measured as follows.

**The satisfaction of pregnant women:** -was measured by health service-related statements prepared to measure satisfaction developed from a similar study.

Clients are categorized as not satisfied (if they score below or equals to the mean) or satisfied (if they score greater than the mean satisfaction score) by using client satisfaction rated by 12 items of questions. These questions were related to satisfaction of client on provider behavior, communication skill, waiting time, clinic amenities, waiting area, laboratory tests, drugs given, privacy during the consultation, procedure, information received about ANC services, continuity of care, the recommendation to other and general feeling of the client, each having five-point Likert scale from 1 indicating strongly disagree to 5 indicating strongly agree (3).

## 2.7. Data quality assurance

The questionnaire was prepared in English. Then it was translated to Afaan Oromo and translated back to English by language professionals for its consistency. Two days of training was given for data collectors and supervisors. The Questionnaire was pretested on 15 pregnant women out of the study area. Medical records were standard tool as it was developed nationally and providers have training on health information management system. During data collection time, the data collectors were closely supervised. The questionnaire and checklist were checked for completeness and consistency.

## 2.8. Data processing and analysis

Following the data collection, data were coded and, entered into EPI Data version 3.1 and exported to SPSS version 20.0 for analysis.

**Structural aspects of quality:** To assess structural aspects of the quality, six different components (Management system, Basic amenities, Diagnostic equipment, Infection prevention materials, Laboratory equipment, and Essential drugs) were used and indices for each of them were generated. To generate an index, each variable was used to assess the six different components of structural aspects that were scored, and then the sum of the scores was obtained. For example, the management system index had three variables in which each was given a score of '1' if present and '0' if absent. The management system index, therefore, had values ranging from (0–3). A similar approach was used for the generation of indices for Basic amenities, Diagnostic equipment, Infection prevention materials, Laboratory equipment, and Essential drugs. The Basic amenities index had values ranging from (0–7), Diagnostic equipment index had values ranging from (0–8), Infection prevention materials index had values ranging from (0–8), Laboratory equipment index had values ranging from (0–6), and Essential drugs index had values ranging from (0–4), depending on the number of variables assessed in each of them as described under the operational definition above.

To compute comparison between the health facilities' structural aspects of the quality, the indices of basic amenities, diagnostic equipment, infection prevention materials, and laboratory equipment were categorized into two, "Poor or good".

The structural aspects of the quality were graded as poor if its categorized index value was between zero and four and as good if the value was above five (8). While for the Management system and Essential drugs, the indices generated were not categorized and the results presented in narrative and table.

**Process aspects of quality:** - To assess process aspects of the quality, four different components (General and Gynecological examination are done, Routine ANC tests are done, Drugs are given and Information provided for pregnant women) were used and indices for each of them were also generated. The variables described under each of these categories or components were first scored, such that a variable was given a score of one if undertaken and zero if not undertaken, and then the scores were summed under each of the components described above to generate an index. General and Gynecological examination done index had values ranging from (0–12), Routine ANC tests are done index had values ranging from (0–6), Drugs given index had values ranging from (0–3), and Information provided for pregnant women index had values ranging from (0–8). To compute comparison between the health facilities process aspects of the quality, the indices of General and Gynecological examination were categorized, and Information provided for pregnant women was categorized into two categories, "Poor or good". The process aspects of the quality were graded as 'poor' if its index value was between zero and six, and 'good' if the value was seven and above (8). While for Routine ANC tests done and Drugs are given, the indices generated were not categorized and the results presented by the bar graph and narrated.

### **Outcome aspects of quality**

Pregnant women's satisfaction was used to assess the outcome aspects of the quality of ANC services. Pregnant women's satisfaction was measured by statements related to health services prepared to measure the satisfaction of clients. Clients were categorized as satisfied (if they score above the mean satisfaction score) or not satisfied (if they score equals or below the mean) by using Client satisfaction that was rated by 12 items of health service statements.

These statements were related to satisfaction of client on provider behavior, communication skill, waiting time, Clinic amenities, waiting area, laboratory tests, and drugs are given, privacy during the consultation, procedure, information received about ANC services, continuity of care, the recommendation to other services and a general feeling of the client. Each question has one to five-point of Likert scales.

Descriptive statistics and logistic regression analysis were performed for client satisfaction. In the logistic regression, both bivariate and multivariate analyses were carried out to identify factors associated with client satisfaction. Assumptions of logistic regression like model fitness, multicollinearity and normality were checked. All the variables were entered into bivariate logistic regression analysis and those explanatory variables with a p value < 0.25 in the crude analysis were considered as a candidate for multivariate logistic regression analysis and those variables with a p-value < 0.05 in the multivariate logistic regression analysis were considered as a significant predictors of satisfaction. Finally, the results of the analysis were reported in texts, tables, and graphs as appropriate.

## **3. Results**

### **3.1. Socio demographic characteristics of the respondents**

A total of 316 pregnant women were enrolled in the study making the response rate of 100%. The majority 130(41.13%) of pregnant women belongs to the age range of 15–19 years. Three hundred seven (97.2%) of the women were married, 6(1.9%) single and the rest three (0.9%) were divorced. The predominant ethnic group of the respondents was Oromo 306(96.8%) and 10(3.2%) were Amhara (Table 1).

Table 1

Socio demographic factors of the pregnant women attending ANC clinic at public health facilities in Kellem Wollega zone, June 2016

<b>Socio demographic factors</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age category of the respondents in Years</b>		
15–19	130	41.13
20–24	109	34.5
25–29	48	15.2
30–34	28	8.9
<b>Occupation of the respondents</b>		
House wife	226	71.5
Government Employee	29	9.2
Student	20	6.3
Merchants	17	5.4
Daily laborer	9	2.8
Local alcohol seller	6	1.8
Others*	9	2.8
<b>Educational level of the respondents</b>		
Cannot write and read	66	20.9
Primary (1–8 Grade)	137	43.4
Secondary school(9–10 Grade)	66	20.9
Preparatory school(11–12 Grade)	10	3.2
College and above	37	11.7
<b>Religion of the respondents</b>		
Protestant	181	57.3
Muslim	81	25.6
Orthodox	39	12.3
Others**	15	4.7
Others*= Jobless, self-employee		
Others**= Wakefata, Adventist		

## 3.2. Obstetric and Reproductive health characteristics

Among the total study participants, 195(61.70%) had given birth to one to four children and Concerning the number of antenatal care visits for the current pregnancy, 113 (35.8%) visited the ANC clinic for the second time followed by 98(31%) first, 77(24.4) third and 28(8.9%) fourth (Table 2).

Table 2  
Reproductive profile of the pregnant women attending ANC clinic at public health facilities at Kellem Wollega zone, 2016

S.No	Reproductive profile of the pregnant women (N = 316)		
	Parity	Frequency	Percent
1.	Null Para	95	30.1
2.	Multi-Para	195	61.7
3.	Grand Multi-Para	26	8.2
Obstetric profile of the pregnant women (N = 221)			
1.	Live birth	209	94.6
2.	Had history of Child Death	25	11.3
3.	History of Abortion	31	14.0

## 3.3. Structural attributes of the quality

Only Two facilities had all the components of the management system while other facilities have less than 50% of the components. At 7 of the facilities, all ANC service providers reported having taken training on ANC. All facilities had assigned midwives for ANC and delivery services and also had a minimum of two providers at the facilities. Five of the public health facilities had not supervised for their MCH activities by external bodies within the past six months (Fig. 1).

Regarding the basic amenities, 6(75%) of the facilities were categorized as good in having basic amenities. However, 3(37.5%) of the facilities had neither a private ANC room nor a private toilet.

With regards to the infection prevention materials as FMOH infection prevention guidelines, all health facilities have adequate infection prevention materials and are categorized as good. Soap for hand washing, sterilizer, waste disposal bin, sharp container, latex glove, and anti-septic solutions were seen at all health facilities during data collection. But, almost 50% of the facilities have no disinfectant solution and one facility reported that there was no water source in the compound during the data collection period.

Regarding diagnostic equipment, all the facilities were categorized as good as most of the important diagnostic equipment was seen during a facility audit. Gynecological examination table, blood pressure measuring apparatus, stethoscope, fetoscope, and vaginal speculum were seen and were functional at all facilities.

Gynecological examination light and thermometer were seen only in 2(25%) and 3(37.5%) of the facilities respectively. None of the facilities has a tape meter for uterine size measuring.

All the facilities had microscopy, urine analysis/ urine dipstick tests, blood group and RH tests, pregnancy tests, and blood film test for malaria. VDRL for syphilis test was seen at five facilities and Hemoglobin test at seven facilities. HIV test algorithm was seen at only two facilities.

All health facilities have essential drugs (Iron, Mebendazole, TT vaccine, and ART drugs) for ANC services as per the standards.

### **3.4. Process Attributes-Interpersonal aspects**

Regarding the interpersonal relationship between providers and clients, 273(86.4%) of the clients reported that the provider discusses with them anything that bothers them and 285(90.2%) of the clients said that the providers attentively listened to their concerns during their ANC checkups.

The clients were asked to rank the time they spent with providers during the consultation and ranked as about the right time by 190 (60.1%), a short time, 68(21.5%), a long time by 50 (15.8%) of the respondents.

About 122(38.6%), of the clients, reported that there was another person in the ANC service room other than the provider during their consultation time that worried them, that their privacy was not maintained.

Regarding providers' sex preferences, the majority, 144(45.6%) reported no providers' sex preferences, but, 135(42.7%) and 37(11.7%) preferred to be seen by female and male providers respectively if they are given the chances to choose.

### **3.5. Process Attributes-Technical aspects**

In this study, the technical aspects of the process were assessed as per the recommendation to each visit and gestational age. General and gynecological examination is done, routine ANC laboratory tests done, drugs are given and information provided for pregnant women were the technical aspects assessed. The general and gynecological examination done, 276(87.34%) of the pregnant women received services and were categorized as good as per the criteria cited for this particular study.

### **3.6. Basic ANC laboratory tests done and drugs given**

Among all study participants asked for whether their blood and urine sample had taken, 267(84.5%) and 2235(74.4%) reported that urine and blood samples had taken respectively. The data from medical record review showed that, among all pregnant women who were given basic laboratory services, 241(76.3%) tested urine for infection, 231(73.1%) and 174(55.4%) tested urine protein and hemoglobin respectively.

About 255 (80.7%) of clients reported that Iron pills were given and 281(88.9) of them taken the TT vaccine (Fig. 2).

### **3.7. Information provided for pregnant women during ANC visit**

Information provided for 222(86.21%) pregnant women were categorized as poor as per the criteria cited for this particular study. The most commonly provided information was the importance of HIV testing during pregnancy 304(96.2%), followed by counseling about places of delivery 274(86.7%) and danger sign that may happen during pregnancy and delivery 259(82%). The least provided information was the importance of postpartum family planning 150(47.5%) and using of the ITN during pregnancy 132(41.8%) (Fig. 3).

### **3.8. Client satisfaction**

About 252 (79.7%) of the pregnant women were scored greater than the mean satisfaction score while the rest 64(20.3%) of the pregnant women scored less than the mean satisfaction score and categorized as dissatisfied. The major items or types of services in the clinics with low satisfaction scores were cleanness of latrine and adequate water supply, good laboratory tests, and medicine given.

### **3.9. Predictors of client satisfaction with antenatal care**

To assess the association of independent variables with the outcome variable (client satisfaction), binary and multiple logistic regression analyses was computed. In binary logistic regression analysis; blood and urine samples taken, Iron tablets given, counseling on the importance of using ITN during pregnancy, importance and types of food to be eaten during pregnancy, danger sign that might happen during pregnancy, labor, and postnatal period and birth preparedness were a candidate for multiple logistic regression.

In multiple logistic regression analyses; a urine sample taken during one of ANC visits AOR 3.36(1.70, 6.61) and counseling on importance and types of food to be eaten during pregnancy AOR 2.27(1.16, 4.45) were predictors of client satisfaction on ANC services (Table 3).

Table 3

Lists of variables seen to be candidate for multiple logistic regression and predictor variable for client satisfaction among ANC attending pregnant women in public health facilities of Kellem Wollega Zone, West Ethiopia, June 2016

Variables	P-Value	AOR	95% C.I.	
			Lower	Upper
Counseled on importance of recognizing danger symptoms that may happen during pregnancy or delivery	0.078	1.963	0.927	4.159
Blood sample taken during any of your visit	0.278	1.59	0.688	3.673
Urine sample taken during ANC Visit	0.001	3.361	1.709	6.612
Counseled on importance of using ITN during pregnancy	0.24	0.671	0.345	1.305
Counseled on birth preparedness and complication readiness	0.655	1.166	0.594	2.29
Counseled on importance of types of food to eat during pregnancy)	0.017	2.271	1.16	4.447
Iron tablets given during ANC	0.212	0.627	0.30	1.306

## 4. Discussion

According to this study, a different attribute of quality ANC services varies from facility to facility. From structural attributes, only two facilities have all the components of the management system, while other facilities have less than 50% of the components, the majority of the facilities were categorized as good by basic amenities and infection prevention materials were available at all the assessed facilities. Regarding diagnostic equipment, all facilities were categorized as good. Laboratory equipment for ANC varies from facility to facility. Seventy-five percent of the facilities were categorized as having good laboratory equipment and all facilities had essential drugs used for ANC services.

The finding of diagnostic equipment from the current study is comparable to a study conducted in Eastern Uganda. The study also found out that the availability of physical infrastructure and diagnostic equipment was good in the health facilities however the availability of essential drugs was generally poor which is different from the finding of the current study (8). The differences in essential drugs might be due to the current Ethiopian health care finance and integrated pharmaceutical and logistic system.

Regarding the process aspects of quality, in this study, most of the respondents reported that the providers seem interested to listen to their concern actively which is in line with the study conducted in Bahir Dar and Ambo town, where 365 (98.9%) and 206(71.5%) of respondents reported that the providers seem interested in listening to their problem respectively (3, 7)

In this study, the privacy and confidentiality of clients were not secured during consultation time. This might be because three of the facilities in this study area had no private ANC room and they were providing the services with other services like family planning and Immunization. Also finding from Bahir Dar showed that, 51 (13.8%) of the study participants reported that there were people other than the provider during the consultation (3)

Laboratory tests done for pregnant women in this study were Rh factors 226(71.5%), syphilis tests 183(57.9%), Hemoglobin tests 174 (55.1%), urine protein tests 241(76.3%), and HIV test 198(62.7%). The study conducted in Bahir Dar especial zone showed that laboratory tests done were blood group and Rh 133(36%), syphilis tests 73(31.7%), Hemoglobin 113(30.6%), urine protein 128(31.7%), and HIV test 304(82.3%) (3). The finding of the current study was better than that of Bahir Dar almost in all laboratory tests except HIV test. The difference between the studies might be due to the current attention paid to improve maternal and child health from government and other partners, exempted maternal and child health services. The HIV test service in the current study was lower and this could be due to the HIV test kits shortage during the study period.

In this study, almost all 315(99.7%) of pregnant women's weight had measured, 211(66.8%) of pregnant women's gestational age were estimated, 252(82%) of them had measured their blood pressure. Another study conducted at Jimma town, which demonstrated that the blood pressure and weight of 33 (8.9%) and 17 (4.6%) of the study women were not measured, respectively (9). The difference of finding between the studies might be due to the training status of ANC service providers'

Client's satisfaction affects clinical outcomes and client retention. In the current study, 252(79.7%) of pregnant women were satisfied with ANC services they received from public health facilities. The finding of this study is similar with the study conducted in southwest Nigeria (81.4%) (11), and study conducted in Gambia (79.9%) (12). The current prevalence is high compared with studies conducted in Jimma (60.4%) (9) and Bahir Dar (52.3%) (3). On the other hand, the finding of the current study is lower than the study conducted in Ambo (89%) (7), study conducted in south east Nigeria (89.7%) (10), and study conducted in Egypt (97%) (13). The possible reason for the difference in finding might be related to the year of study, availability of qualified health professionals like midwife nurses and ANC trained providers at the study area, modern infrastructure and good care.

A urine sample taken during one of ANC and being counseled on types of food to be eaten during pregnancy were predictors of client satisfaction in this study. This may be because clients who obtained the service they want are more satisfied than those who failed to get the service they assumed. However, these variables were not found to be associated factors with client satisfaction on ANC service in other studies (3, 7, 8, 13–16).

## 5. Limitation

The study used a cross-sectional design that cannot establish trends and causality between the Quality of ANC and risk factors. Also, social desirability bias leads to under-reporting of the important component

for measuring the quality of ANC. Not only this, but also lacked of appropriate literatures made us use very few number of references.

## 6. Concussion

The findings of the current study showed that all the WHO recommendations didn't fulfilled. The majority of the pregnant women (79.7%) were satisfied with the antenatal care services they received. A urine sample taken during one of the ANC visits, and counseled on the importance and types of food to be eaten during pregnancy were predictor variables for client satisfaction on ANC services.

## 7. Recommendation

- Privacy of clients should be secured by making ANC clinic a private room and avoiding other persons entering the procedure room other than the provider during consultation time and all ANC service providers and facilities heads are responsible.
- All pregnant women have to get access to disease screening like syphilis and HIV tests as these infections to affect the health of both mothers and newborns. Facilities' heads, district health office, zonal, and regional health bureau are responsible to avail the necessary tests and supplies in continuity.
- Cleanliness of latrine, water supply, and laboratory services are things to be improved at all assessed facilities to increase the satisfaction level of pregnant women with ANC service and respective facilities' heads are responsible.

## 8. Abbreviations

AIDS Acquired Immune Deficiency Syndrome

ANC Ante Natal Care

AOR Adjusted Odd Ratio

BP Blood Pressure

COR Crude Odd Ratio

EDHS Ethiopian Demographic Health Survey

HGB Hemoglobin

HIV Human Immunodeficiency Virus

ITN Insecticide Treated Nets

PMTCT Prevention of Mother to Child Transmission

STI Sexually Transmitted Infection

TB Tuberculosis

VDRL Venereal Disease Research Laboratory

WHO World Health Organization

## **9. Declarations**

### **9.1. Ethical approval and consent to participate**

Ethical clearance was obtained from Wollega University, Institute of Health Sciences Ethical Review board. A formal letter was written to different administrative bodies and organizations to obtain permission to conduct the study in the settings. After informing about the objectives of the study, confidentiality, and the right to participate or interrupt participation, written informed consent was obtained from all study participants before the interview.

### **Consent for publication**

Not Applicable

### **9.2. Availability of data and materials**

The data collected for this study can be obtained from the corresponding author based on a reasonable request.

### **9.3. Competing of Interest**

The authors declare that they have no conflict of interest regarding the publication of the paper.

### **9.4. Funding**

Not applicable

### **9.5. Authors' Contribution**

MD, AN, DW and MG wrote the proposal, participated in data collection, analyzed the data and drafted the paper. GK, WD and EM approved the proposal with great revisions and revised subsequent drafts of the paper, contributed in the designing of the methodology and write-up. All authors have read and approved the manuscript.

### **9.6. Acknowledgement**

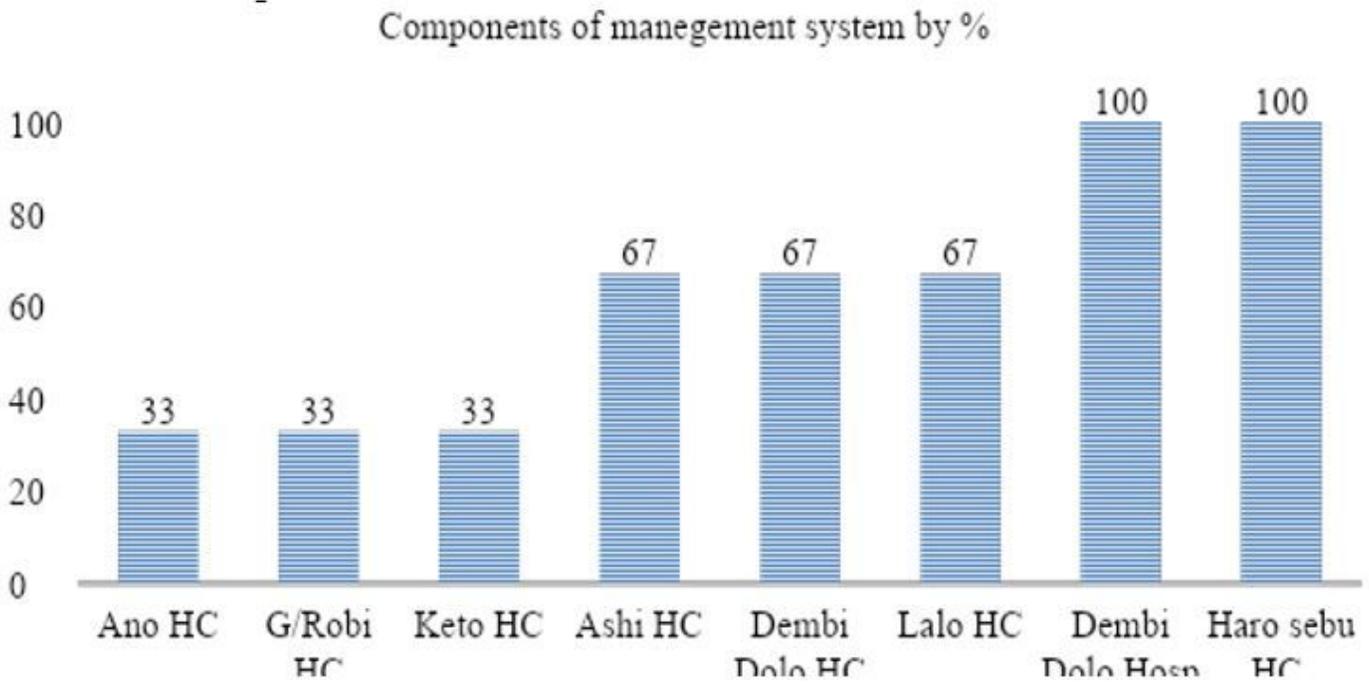
Authors would like to thank Wollega University, Institute of health sciences for initiating them to conduct this study and financial support. Also, special thanks to data collectors, supervisors and all peoples who involved in the study directly or indirectly.

## 10. References

1. WHO/UNICE. Focused Antenatal care in developing countries: Promises, achievements and missed opportunities analysis of trends 1990-2001. Geneva; 2003.
2. Central Statistics Agency of Ethiopia. Ethiopian Mini Demographic and Health Survey Report; 2014.
3. Ejigu T, Woldie M and Kifle Y. Quality of antenatal care services at public health facilities of Bahir-Dar special zone, Northwest Ethiopia. *BMC Health Services Research*. 2013, 13:443.
4. WHO. Antenatal care in developing countries: promises, achievements and missed opportunities; an analysis of trends, levels and differentials 1990–2001. Geneva; 2003.
5. Chege J, et al. Feasibility of introducing a comprehensive integrated package of antenatal care services in rural public clinics in South Africa, frontiers final report. Washington, DC: Population Council; 2008
6. Ethiopia Central Statistical Authority. 2007 Population and Housing Census of Ethiopia Administrative Report. 2012; Addis Ababa.
7. Nemera A, Abebe M, Ejeta E. Assessment of Quality of Antenatal Care (ANC) Service Provision Among Pregnant Women in Ambo Town Public Health Institution. *American Journal of Nursing Science*. 2015. 4:3(57-62).
8. Mahmoud Fathalla. Antenatal and Delivery care utilization in urban and rural contexts in Vietnam. Gothenburg, Sweden; 2012.
9. Fantaye Chemir, Fessahaye Alemseged and Desta Workneh. *BMC Research Notes*. 2014; 7:164.
10. Olufemi T. Oladapo, Christianah A. Iyaniwura and Adewale O. Sule-Odu. Quality of Antenatal Services at the Primary Care Level in Southwest Nigeria. *African Journal of Reproductive Health*. 2008; 12:3: (71-92).
11. Isatuo K. Jallow, Yiing-Jenq Chou, Tsai-Ling Liu and Nicole Huang. Women's perception of antenatal care services in public and private clinics in the Gambia. *International Journal for Quality in Health Care*. 2012; 24:6 (595–600).
12. Stephen Hodgins, Alexis D'Agostino. The quality–coverage gap in antenatal care: *Global Health Science and Practice*. 2014; 2:2.
13. Moses Tetui<sup>1</sup>, Elizabeth Kiracho Ekirapa, John Bua, Aloysius Mutebi, Raymond Tweheyo and Peter Waiswa<sup>1</sup>. Quality of Antenatal care services in eastern Uganda: implications for interventions. *Pan Afr J*. 2012; 13:27.
14. Srivastava et al. Determinants of women's satisfaction with maternal health care: a review of literature from developing countries. *BMC Pregnancy and Childbirth*. 2015; 15:97

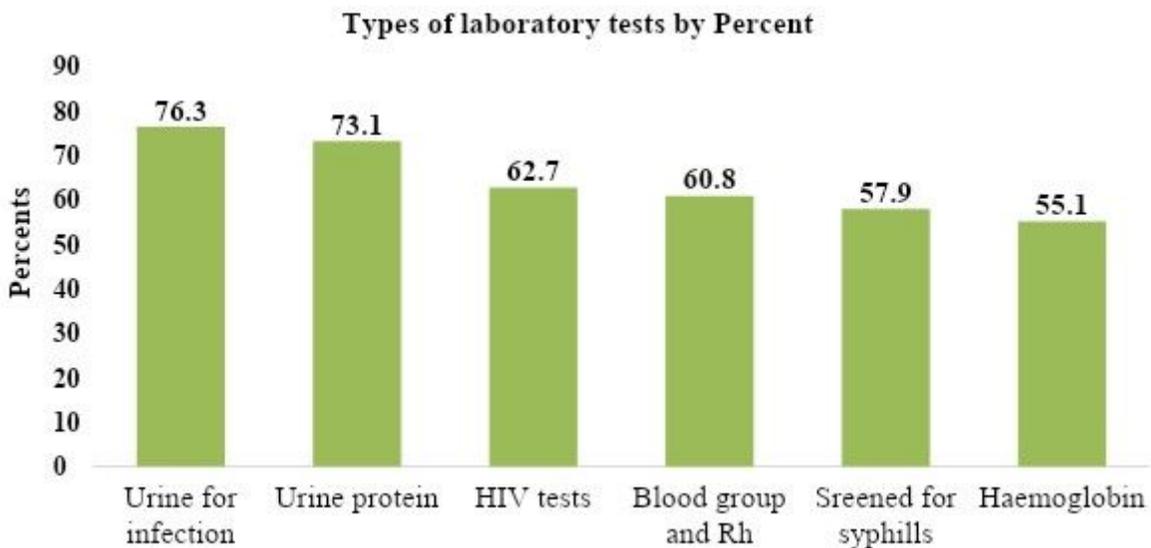
15. AsmaHasan. Patients satisfaction with maternal and child health services among attending the maternal and child health training institution in Dhaka, Bangladesh, 2007.
16. Hanan Abbas, Abdo Abdel and Rahman El Gammal. Dimensions of Quality of Antenatal Care Service at Suez, Egypt. JFMPC. 2014; 3:3(238-248).

## Figures



**Figure 1**

Components of the management system by %



**Figure 2**

Types of laboratory tests by Percent

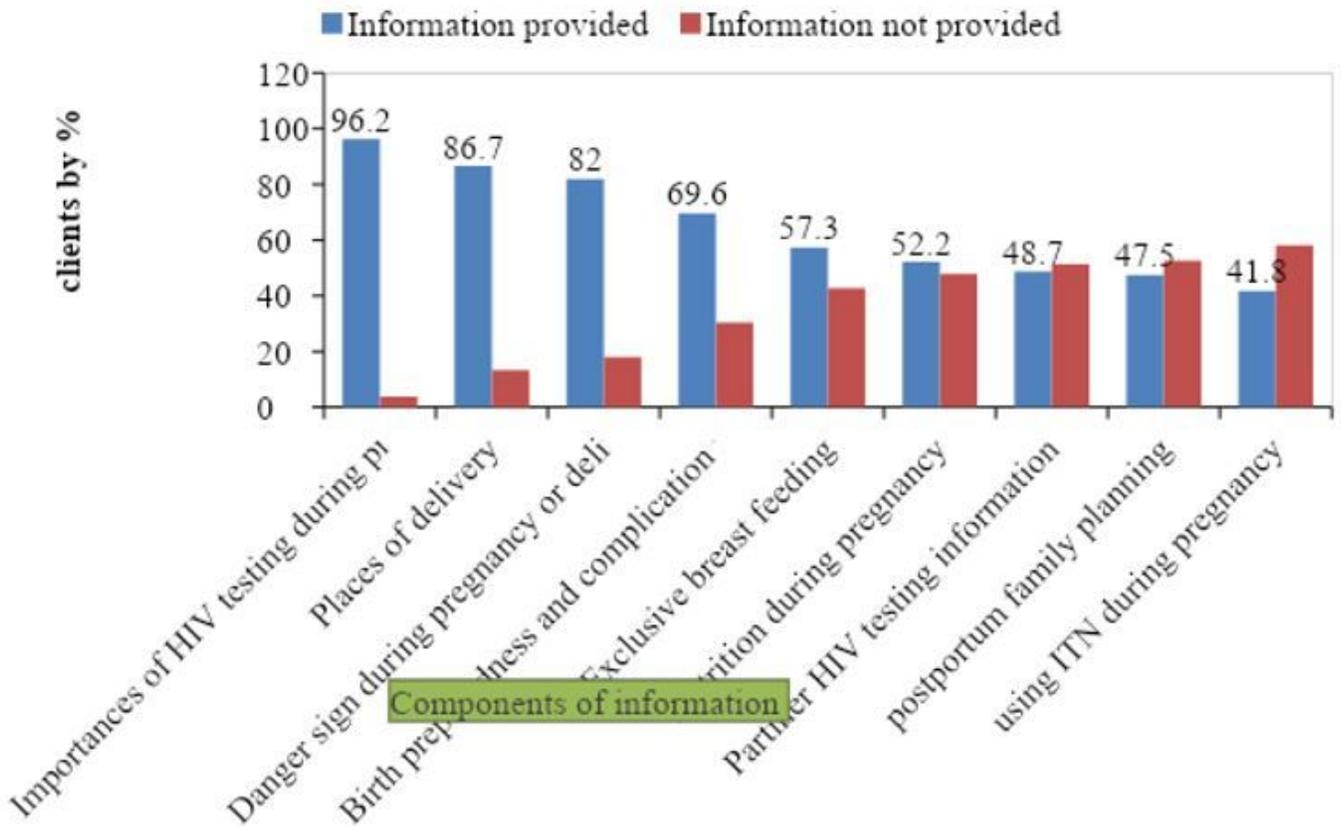


Figure 3

Information provided for pregnant women during ANC visit