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Quality of health care service assessment using Donabedian model in East Gojjam Zone, Northwest Ethiopia, 2018

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Donabedian model health care quality assessment measures the difference between expected and actual performance to identify gaps in the health care system, which would serve as a starting point for quality improvement activities. So, the aim of this study was to assess the level of quality of health care with respect to structural settings, actual process of care, and outcomes of care. Institutional based both quantitative and qualitative cross-sectional study design was conducted. 735 patients selected using a multi-stage sampling method from randomly selected public health institutions of East Gojjam zone. Data were collected using semi structured interview questions and observational checklist adapted from national guidelines as a quality indicator of the Donabedian health service quality framework. Data were entered into SPSS version 20 for analysis. Bivariate and multivariate logistic regression was fitted to selects associated factors. The studied health institution fulfilled 137 (73.3%) of major equipment requirement against the national standard, diagnosis with treatment based on guideline rated (56.7%), nursing care rated (40%), and average satisfaction level of patients with given care is 39.7%. Residence, standard healthcare facilities, health workers' communication, and accessibility of health facility have significant association with patient satisfaction. This study found that quality of care in health facility is rated as poor against national standards. Promoting quality healthcare communication at all levels of health facilities is important. Minister of health and regional health bureau must ensure the accessibility of per standard healthcare facilities to improve outcomes of health care.

Key words: Donabedian, East Gojjam, Ethiopia, quality of care.

INTRODUCTION

Health care quality can be defined as the degree to which health services for individuals and populations increase the likelihood of desired health outcomes (Gaynor, 2007; Schuster et al., 2005). Widely used in studies of health care quality, links health care services with desired health outcomes and focuses upon the gap between current versus desired practices (Counte, 2007; Crow et al., 2002; Poon et al., 2010). The health system should seek to make improvements in six areas or dimensions of quality which are effective, efficient, accessible and timely, acceptable/patient-centered, equitable and safe (Poon et al, 2010; Naidu, 2009). There are multiple approaches to measuring the quality of care (Faezipour and Ferreira 2003; King, 2011). Donabedian proposed

that one could assess whether high-quality care is provided by examining the structure of the setting in which care is provided, by measuring the actual process of care and by assessing the outcomes of cares (Tunçalp et al., 2015, Berwick and Fox, 2016). Thus, the most suitable and sustainable environment for continuous quality improvement is the introduction of a quality culture based on common understanding, vision, purpose, values, and principles (Poon et al., 2010; Faezipour and Ferreira, 2003; Kelley and Hurst, 2006).

Almost all countries face challenges to guarantee effective, efficient, accessible, timely, acceptable/patient-centered, equitable, safe, technology and evidence-based medicine within available resources (Jencks and Wilensky, 1992, Gok and Sezen, 2013; Weiskopf and Weng, 2013). A review study done in United State of America (USA) revealed that 50% of patients studied received recommended preventative care, 70% received recommended acute care, 30% received contraindicated acute care, 60% received recommended acute care, and 20% received contraindicated chronic care, in spite of the pronouncement of many that "USA has the best health care in the world" studies consistently find that care is far from optimal (Schuster et al., 1998). Another study done in USA found that participants only received about 55% of recommended care (McGlynn et al., 2003).

In Ethiopia, there is good coverage and expanding of health institutions but as far as my knowledge is concerned, the level of quality is yet not measured as the country level. Most of the studies in Ethiopia have been in facility base (Beyene et al., 2011; Oljira and Gebre-Selassie, 2001). However, there is a huge rumor and complain from the public and health professionals for poor quality service in Ethiopia and there is emerging interest to assess patient satisfaction and pull together the views of patients about the services they use (Beyene et al., 2011, Yesuf et al., 2019). Satisfaction is essential if we have to get people utilize services, comply with treatments and improve health outcomes. Assessing outcomes has value both as pointer of the effectiveness of various interventions and as part of a monitoring system heading for improving quality of care plus noticing its deterioration (Crow et al., 2002). The Donabedian model health care quality assessment measures the difference between expected and actual performance to identify gaps in the health care system, which would serve as a starting point for quality improvement activities (Crow et al., 2002, WHO, 2004, WHO, 2006, Tandon et al., 2000). Therefore, the present study was designed to

provide baseline information for the level of quality of health service on the study area in institutional base using Donabedian model. So, the aim of this study was to assess the quality of care with respect to structural settings in which care were provided, measuring the actual process of care, and assessing the outcomes of care.

MATERIALS AND METHODS

Institutional based quantitative and qualitative cross-sectional study design was used. The study was conducted in public health institutions in East Gojjam zone. East Gojjam is one of the 13 zones in the Amhara National Regional State. The capital of East Gojjam zone, Debre Markos is located 300 km northwest of Addis Ababa along the high way that extends from Addis Ababa to Bahir Dar which is the capital city of Amhara Regional State. East Gojjam zone has a total area of 13809 km^2 with a total population of 2,451,959 with 1,199,952 males and 1,252,006 females. It has 18 woreda and 425 rural kebeles. There are four hospitals in the zone from which two are newly established in 2015. Eighteen health centers and 384 health posts and studies were conducted from February to July, 2018.

Inclusion criteria were public health institutions delivered health service in the last 12 months before the survey, clients/patients who come to public health institutions for services and surrogate respondents for pediatrics. Exclusion criteria were health posts and patients who are severely ill and client/patients <18 years who visit the clinic alone. Two hospitals: Motta and Bichena district hospitals and five health centers of Motta, Bichena, Robgebya, Debreeliase, and Kuye health centers were selected using a random sampling method. The sample size for satisfaction was calculated using indicators from the previous study in Jimma zone-Ethiopia (Beyene, 2011). Considering the proportion of fulfillments of major equipment is 62.8% to give the maximum sample size. Hence, based on a single population proportion formula with 2 design effects, at 95% confidence interval with a marginal error of 5% and 10% non-response rate the total sample size was 735 patients/clients.

Multistage sampling method was used; after stratified (with the assumption of difference in health care services in hospitals and health centers), then two hospitals and five health centers were selected by using simple random sampling method then the clients/patients were selected systematically (every 5th clients/patients) from the selected institutions till the required sample size obtained. Donabedian framework of structure-process-outcome model of health care quality was used for quality measurement. Structure indicators included the standards set by the ministry of health for each specific health facility regarding all resources. Process indicators in the care delivery process: basic laboratory investigation, patient-clinician interaction and patient satisfaction were taken as an outcome indicator.

All selected study participants were interviewed using structured questionnaires adapted from different kinds of literature and modified into local context (Beyene et al, 2011, Landon et al., 2001; McDowell, 2006). Health facility structure and process of the care

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Table 1. Availability of major equipment in health facilities, East Gojjam zone, 2018.

District hospital		Health centers		Total	
Standard (%)	Available (%)	Standard (%)	Available (%)	Standard (%)	Available (%)
146 (100)	108 (73.9)	41 (100)	29 (70.7)	187 (100)	137 (73.3)

Table 2. Availability of health human power, East Gojjam zone, 2018.

Category of staff	District hospital		Health centers		Total	
	Standard	Available	Standards	Available	Standards	Available
Specialists	0	0	0	0	0	0
General practitioners	4	7	0	0	4 (100)	7 (175)
Health officers	3	1	2	2	5 (100)	3 (60)
Radiographers	2	2	0	0	2 (100)	2 (100)
Lab. Professionals	4	5	2	3	6 (100)	8 (133)
Nurses(all type)	42	40	7	9	49 (100)	49 (100)
Environmental Health	1	0	1	0	2 (100)	0
All technical support staffs	4	25	5	8	9 (100)	33 (366)

were observed using checklists adapted from national standards (Yirga et al., 2012). Facility managers (focal persons) were interviewed and documents were reviewed to rate equipment availability as "per standard facility structure" defined as rates more than meanwhile rated through observation using checklist prepared on the basis of the national standard. Observation, interview with assigned health personnel or team leader and reviewing records were used to rate three service delivery points in triage, outpatient and inpatient departments as per "standard process" and defined as rates more than mean by observing client-provider interaction using an observational checklist based on the national standard. Client satisfaction: clients were asked to rate their received health care as in 5 levels; highly dissatisfied, dissatisfied, fair, satisfied and highly satisfied which were taken for >75%, 50-75% and <50% satisfaction level. Then, we categorized "fair, satisfied and highly satisfied" into "satisfied" and highly dissatisfied and dissatisfied into not satisfied to dichotomized the responses (WHO, 2004). Eight B.Sc Midwife health professionals for data collection and four experienced M.Sc health professionals for supervision were recruited. The two-day training was given for data collectors about the aim of the study. A pre-test was done on 37 patients outside the main study area. During the pre-test, the questionnaire was assessed for its clarity, understandability, completeness and time consumption. Also, the sensitivity of the subject matter and pattern of response was assessed. On each day until the end of the study period, the trained data collectors were collect the data by using the tools to the study subjects. The data collectors have submitted the filled questionnaire to their respective trained supervisors daily then all the collected data were checked for completeness, accuracy, and consistency and corrected accordingly.

After being coded, the data was entered into SPSS version 20 statistical package for analysis. Descriptive and inferential statistics were used to present the data. Descriptive statistics like frequency and percentage were used to summarize the socio-demographic characteristics of the study participants. Logistic regression (bivariate and multivariate) analysis used by taking client/patient satisfaction as the main outcome quality indicator and odds ratio was calculated with p-value less than 0.05 at 95% confidence interval to describe associations between independent and dependent variables. Variables from a binary logistic regression model with considering odds ratio if p<0.05 at CI: 95% was entered into the multivariate logistic regression model to identify significant factors. Then the odds ratio of multiple logistic regression and p-value were less than 0.05 at 95% CI used for statistical significance determination. Ethical clearance and approval to conduct this research were obtained from Debre Markos University, College of Health Sciences, Institutional Research Ethics Review Committee (IRERC). The ethical consideration was taken into account which requires voluntary, informed consent, using the consent form designed for this study obtained from the participants. Prior to administering of questionnaire, the aims and objectives of the study were clearly explained to the participants.

RESULTS

Major equipment

In East Gojjam zone district hospitals and health centers had fulfilled major types of equipment requirements of 108 (73.9%) and 29 (70.7%) against national standard, respectively. They also fulfilled composite major equipment requirements of 137 (73.3%) against the national standard. (Table 1).

Human resource

The studied institutions had no specialist and environmental health professionals. The institution had seven general practitioner, 2 radiographers, 49 nurses and 3 health officers (Table 2).

Characteristics of the health facilities

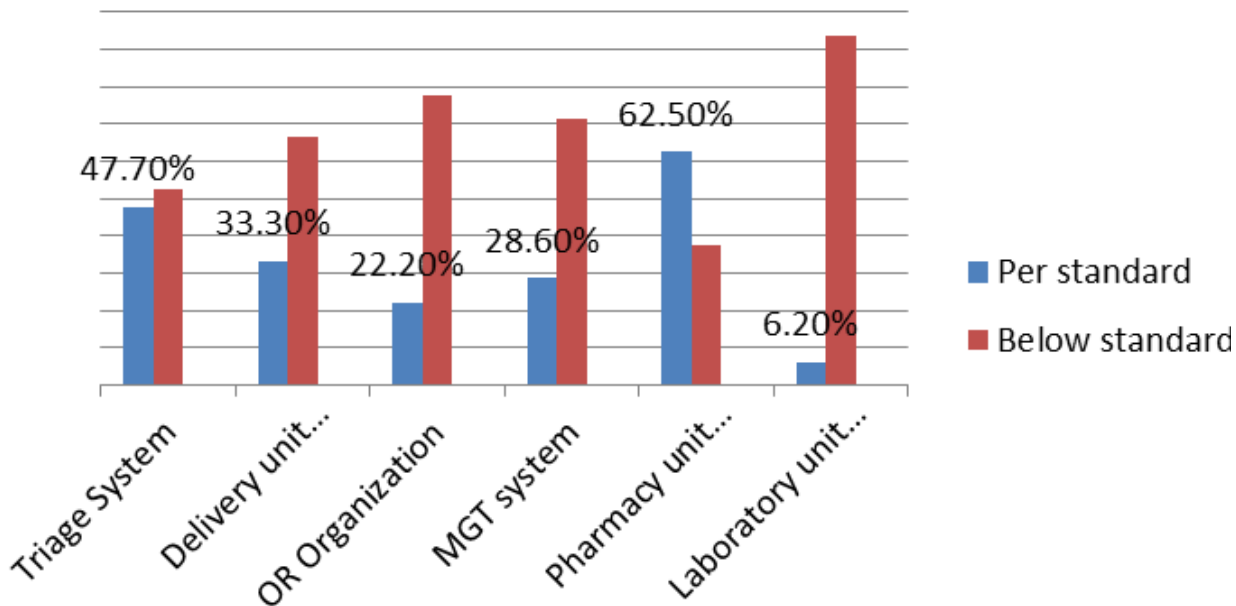Characteristics of the health facilities such as triage

Figure 1. Characteristics of the health facilities, east Gojjam Zone, Amhara, Ethiopia, 2018.
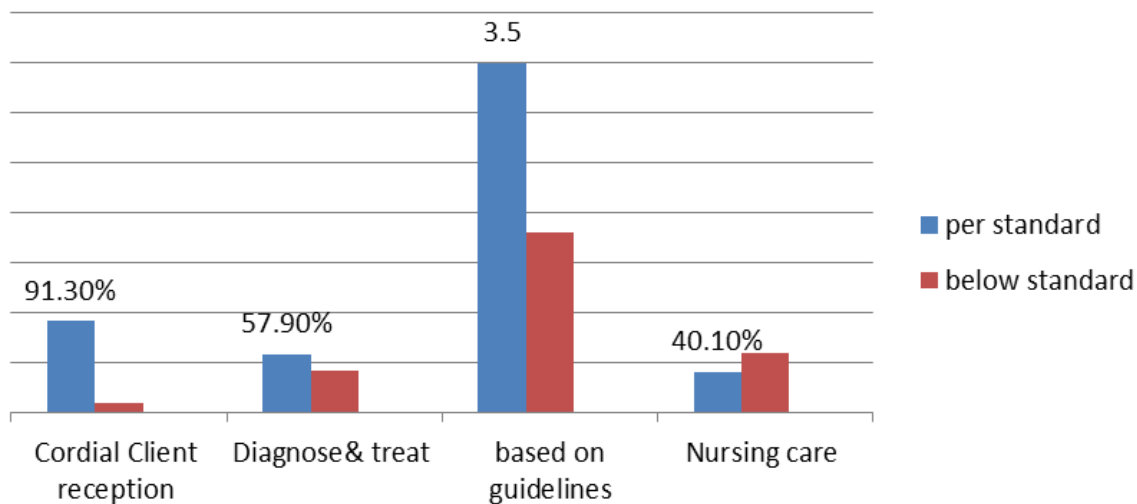

Figure 2. Client-provider interaction, East Gojjam zone, 2018.

system, infection prevention practice, delivery unit organization, management system, operation room organization and laboratory unit organization fulfilled national standards of 47.7, 40.2, 33.3, 28.6, 22.2, and 6.3%, respectively (Figure 1).

Client-provider interaction (process)

Cordial client reception rated 91.3% against national standards, diagnosis, and treatment based on guideline

rate of 57.9% and nursing care rate of 40% (Figure 2).

Socio-demographic characteristics of clients

A total of 707 patients/clients in public health facility who utilized services and consented were approached with 95.4% response rates. The mean age of respondents was 31.2 and SD was ±11.2. Female respondents were 55.8%, while most people follow Orthodox religion (88.6%) and almost all respondents ethnicity were

Table 3. Socio-demographic characteristics of clients in Public health facility, East Gojjam Zone, Ethiopia, 2018(n=701).

Characteristics	Category	Frequency	Percentage
Marital status	Married	475	67.8
	Single	176	25.1
	Widowed	18	2.6
	Divorce	32	4.6
Educational level	Not read and write	236	33.7
	Read and write	149	21.3
	Primary education	130	18.5
	Secondary education	108	15.4
	College	78	11.1
Occupation	Farmer	295	42.1
	Merchant	139	19.8
	Government employee	84	12
	Jobless	60	8.6
	Student	87	12.4
	Other*	36	5.1
Residence	Rural	333	47.5
	Urban	368	52.5
Health service fee	Without Fee	187	26.7
	With Fee	314	44.8
	Health service insurance	200	28.5
Frequency of visit to health facility	New	291	41.5
	≥2 times	410	58.5

*Daily laborer, Private employ.
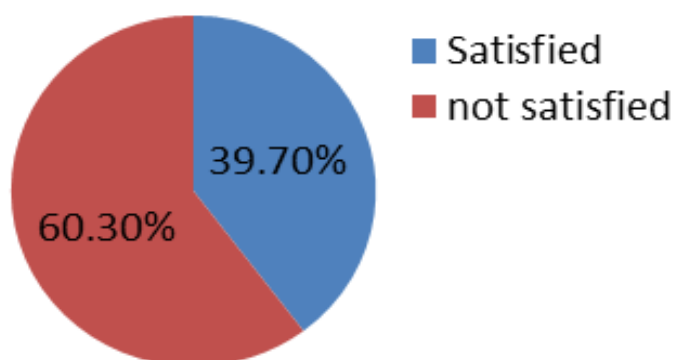
Figure 3. Client satisfaction with a given care, East Gojjam zone, 2018.

Amhara (99.3%). Most of the respondents were from the outpatient unit (93%) (Table 3).

Client satisfaction with a given care

Two hundred and seventy-eight (39.7%) patients were satisfied with given care and 423 (60.3%) were not satisfied with given care. Client's satisfaction by health professionals, health facility physical status, patient-centered communication, way of diagnosis with treatment and health service viability were rated as 95.4, 94.3, 92.7, 84.6 and 3.7% respectively (Figure 3).

Factors associated with satisfaction

Bivariable logistic regression analysis was made to see

Table 4. Factors associated with satisfaction of clients, East Gojjam, Ethiopia, 2018.

Variable	Satisfaction		COR (CI: 95%)	p-value	AOR (CI: 95%)	P-value
	Satisfied	Unsatisfied				
Education						
Not read or write	181	55	4.739 (2.75,8.14)	<0.001	9.31 (7.34,13.01)	
Can read and write	96	53	2.61 (1.48,4.57)	0.001	3.41 (0.12,2.04)	0.11
≥Diploma	32	46	1		1	
Occupational	75	64	2.61 (1.36,5.91)	0.005	1.44 (0.30,6.33)	0.81
Farmer						
No occupation	24	36	0.42 (0.18,0.99)	0.047	3.21 (2.63,5.04)	
Student	22	14	1		1	
Residence						
Urban	274	59	6.82 (4.81,9.68)	<0.001	5.65 (3.23,9.86)	<0.001**
Rural	149	219	1		1	
Service fee						
Paying	119	68	0.51 (0.32,0.79)	0.003	0.19 (1.01,3.74)	
Health insurance	149	165	0.26 (0.17,0.39)	<0.001	0.22 (0.32,10.31)	0.62
Free	155	45	1		1	
F.structure						
Per standard	405	256	1.93 (1.02,3.67)	0.04	2.27 (1.04,4.93)	0.04*
Below standard	18	22	1		1	
Communication	402	248	2.32 (1.29,4.14)	0.005	2.32 (1.13,4.78)	0.022*
Good	21	30	1		1	
Poor						
Accessibility						
Accessible	2	24	0.05 (0.12,0.22)	<0.001	0.11 (0.24,0.41)	0.005*
Not accessible	421	254	1		1	

*Significant, **Strongly Significant.

the association between outcome variable (satisfaction) with independent variables. Educational status, occupation, residence, service fee, facility structure, communication, and accessibility had a significant association with satisfaction. In multivariable logistic regression analysis only residence, facility structure, communication, and accessibility had a significant association with satisfaction.

Clients who reside in urban were five times more likely to be satisfied with the health care (AOR 5.65 (3.23, 9.86), p<0.05), clients who visit facility structure which is per standard are two times more likely satisfied than clients who visit structures which is not per standard (AOR 2.27 (1.04, 4.93), p < 0.05), health workers communication had association with satisfaction (AOR 2.32 [1.13, 4.78], p < 0.05) as well accessibility of health facility has association with client satisfaction (AOR 0.11 [0.24, 0.41], p < 0.05) (Table 4).

DISCUSSION

The current study found that the level of quality of health service delivery systems in East Gojjam zone was poor against national standards. The level of quality of health service on structure indicators was poor. Low achievements were observed in the equipment requirements, despite high achievement on the structure components (that is, human power) and good on characteristics of health facility setting of emergency

service for 24 h and 7 day/week of the quality indicators against study done in Jimma zone (Beyene et al., 2011) and Ethiopian national standard (Bradley, 2012). The possible rationalization for this variation could be due to time interval and presence of less number of Non-Governmental Organization (NGOS) that can donate some medical equipment on the current study area. The other justification for differences might be due to differences in allocation of budget for health care services between Oromia and Amhara. Ethiopian government working to improve the quality of health service delivery in the country particularly on human resource development and this may be the reason for the achievement of the human resource indicators in the study area was high (Teklehaimanot and Teklehaimanot, 2013, USAID, 2012-2018). However, the inclusion of relatively new health facilities and health centers in this study may have underestimated the findings because new health facilities are relatively not equipped with material resources with less organized facility settings and health centers are relatively not equipped with major material resources (El-Saharty et al., 2009).

Major equipment requirements were only 73.9 and 70.7% of the standards for the district hospitals and health centers, respectively. From the different units of the characteristics in the health facility setting, laboratory unit organization fulfilled only 6.3% of the standards by the FMOH, whereas the emergency service fulfilled 93.8% of the national standards (Keyes, 2011). The current study was slightly higher than from the study done in Jimma zone in fulfillment of major equipment requirements which were 64.3 and 68.2% district hospitals and health centers, respectively (Beyene et al., 2011). The possible explanation for this variation could be due to the involvement of only outpatient units in the study done in Jimma zone but the current study encompasses both inpatient and outpatient units which calls for the need to strengthen the triage system, infection prevention practice, delivery unit organization, management system, and operation room and laboratory unit organization of health facilities to further improve the quality of health care delivery system in the study area.

Regarding human power, radiographers were 100% which was very good, laboratory professionals were 133%, nurses of all types were 100%, but the number of health officers were 60% of the facilities; in addition, there was no environmental health professionals compared with national standards set by the FMOH (Ethiopia, 2012, USAID, 2012-2018). This finding is higher than study conducted in Jimma zone with radiographers (59%) and laboratory professionals (46.4%), nurses of all types (90.9%), health officers (25%), but there was no environmental health in this study which is inconsistent with study done in Jimma zone (75%) (Beyene et al., 2011). The possible rationale might be the study done in Jimma zone involving referral hospitals with human power needs and persuading environment to fulfill health human power with different specialties is higher than district hospitals.

The present study also found that overall achievement for the process of care related quality indicators was also poor. Moreover, the study found that cordial client reception was good (91.3%) of the conditions. However, diagnosis and treatment based on guideline including nursing care were found to be only 57.9 and 40.1%, respectively against the FMOH standards (Ethiopia, 2012, USAID, 2012-2018). This low process quality indicator might be due to the low achievement in the structure indicator (facility structure setting and major equipment) of the determining factors of the quality of care. The possible cause for low achievement on poor diagnosis and treatment could be due to unavailability of health professionals with different specialties (specialists in a different field and environmental health). The finding of poor nursing care might be due to high work burden even if health human power is good against the standard but there is a low provider-client ratio and also health professional turnover could affect the sustainability of health facility performance.

Client satisfaction receiving care in selected health facilities of East Gojjam zone in the current study was poor (39.7%). This study is compare with study done in Jimma zone, Southwest Ethiopia (89.1%) (Beyene et al, 2011), study done in Adama town, Ethiopia (74.7%) (Asefa and Mitike, 2014), satisfaction study done in West Shoa zone in Central Ethiopia (62.6%) (Birhanu et al, 2010) and study done on client satisfaction in Amhara Region, Ethiopia (61.9%) (Tayelgn et al., 2011). The possible explanation for this variation could be, study done in Jimma zone and Central Shoa was only in outpatient unit and again there is a difference in the study population of Adama town (PMTCT) services and Amhara region (only in referral hospital delivery service), these were only pregnant and postnatal mothers, respectively in a single unit.

The finding of the current study is almost consistent with a study done on the post-abortion care unit at governmental hospitals of the Tigray region showing that 40.6% of clients were satisfied with the service delivery system (Demtsu et al., 2013). However, a study conducted on post-abortion care quality in health facilities of the Guraghe zone showed that 83.5% of patients were satisfied with the service (Tesfaye and Oljira, 2013). The possible justification for this poor satisfaction in the current study might be due to the inclusion of all health service units and included only public health facilities that had high client flow (low provider-client ratio) than private health facility which has low client flow (high provider-client ratio).

Moreover, in the present study residence, facility structure, communication, and accessibility have a significant association with client satisfaction towards the service delivery system in the selected health facilities. Being an urban resident were five times more likely to be

satisfied with the health care delivery system compared to clients of being rural resident. However, a study done at a maternity referral hospital in Ethiopia showed that mothers residing outside the town were more likely to be satisfied with the environment than urban (Melese et al., 2014). The possible explanation for this could be urban resident respondents in this study were slightly higher in number than rural residents.

Clients who visited health facilities that had per standard facility structure were more than two times more likely to be satisfied with the health care delivery system than clients who visited health facilities which had below the standard of health facility structures. Furthermore, this study also found that health workers' communication was found to have a significant association with client satisfaction. This finding is consistent with studies conducted in a maternity referral hospital in Ethiopia (Melese et al., 2014), in the Amhara region (Tayelgn et al, 2011). Accessibility was also another significantly associated factor with client satisfaction. It was consistent with the study done in the Amhara region (Tayelgn et al., 2011).

Conclusion

Using a Donabedian quality indicator framework, quality of health care in the health facility of east Gojjam zone, Amhara Regional State, Ethiopia was rated as poor against national standards. Residence, facility structure, communication, and accessibility had a significant association with satisfaction. Promoting healthcare communication at all levels of health facilities is important. Ensuring the accessibility of healthcare facilities focusing on rural residents is needed for clients/patients to be satisfied.

Recommendation

Minister of health, regional health bureau and zonal health offices should take action on facility structure settings: pharmacy unit, triage system, infection prevention practice, delivery unit organization, management system, and operation room theater and laboratory unit organization to be per national standards. Attention should be given to supply of major types of equipment. Health human powers should be fulfilled with different specialty (specialists, HO, Environmental health) per standard. Managers of all respective public health facilities must take action to ensure the institutional capacity and performance of health professionals via giving refreshment training.

Health professionals have to be committed to their work specifically to diagnose and treat per standard, reception of clients should be in a cordial way and there is need for improvement in their nursing care.

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