

# Quality Management System Implementation Status and Its Associated Factors Among Clinical Staffs at Governmental Hospitals in Addis Ababa, Ethiopia

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## Research Article

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# Abstract

**Introduction:** Quality management system is a set of coordinated activities to direct and control an organization in order to continually improve the effectiveness and efficiency of its performance. So, information about the status of health sector quality management system implementation is necessary. However, there is limited information about the quality management system implementation in the study area as well as at national level.

**Objective:** the aim of this study is to assess quality management system implementation and its associated factors at governmental hospitals in Addis Ababa, Ethiopia.

**Methods:** An institution-based cross-sectional study was conducted among 422 health care providers working in public hospitals in Addis Ababa. Simple random technique was used to select both the study settings and study participants. Data were collected by using structured written questionnaire after obtaining written consent from the respondents. The collected data were entered into Epi-data version 3.1 and analyzed using SPSS Version 25. Bivariate and multivariate analysis was done. Variables which had p-value <0.05 at 95%CI were considered as statistically significant association with dependent variable in multivariate analysis. Result was presented in text, table and figures.

**Result:** A total of 422 study participants were participated in the study with the response rate 100%. The mean age of the study participants was 31.46 (SD=5.77) years. The majority (44.5%) of the study participants were below 30 years of age and 55.0% were female by sex. This study revealed that nearly 52% of quality management system were not implemented in the selected health facilities. Being 35 years and above (AOR =1.99) in age, ever heard about QMS (AOR 1.56) by the staff, and those staff knows the availability of QMS (AOR= 2.31) were among variables that identified as predictors of QMS implementation in the study area.

**Conclusion and recommendation;** This study concluded that the level of QMS implementation in the current study area is suboptimal. Age of the study participants, previous hearing about QMS, and knows the availability of QMS were among variables that identified as predictors of QMS implementation in the study area. Therefore, health facilities are recommended to educate their staff about QMS implementation.

## Introduction

Quality management system (QMS) is a set of coordinated activities to direct and control an organization in order to continually improve the effectiveness and efficiency of its performance (1). Quality management (QM) is simply the application of a quality management system in managing a process to achieve maximum customer satisfaction at the lowest overall cost to the organization (2). QM is a philosophy or discipline for continuous success in an organization. It focuses on customer satisfaction, and in the processes of continual improvement of services, and products as well as for preventing problems (3, 4). Implementing QMS enables hospital managers to determine and manage care processes

to meet patients' needs and expectations, and to achieve patient and employee satisfaction (5). Further, QMS improve work quality and safety, service quality, patient/employee satisfaction, organizational performance, flexibility and competitiveness of the health care facilities (5, 6, 7).

Health sectors should make strategic decision to adopt a quality management system based on the organization's strategy, objectives, structure, size, products and services offered (7). With a strong hospitality management system, hospitals would have the capability to promote a quality service (8). For this reason, most hospitals focus on quality management system (9). To solve quality related problems, the government of Ethiopia has considered quality management as a development infrastructure since 1940, and efforts made to disseminate quality service at national level (10).

For the successful implementation of QMS, full commitment of top managements and other staff members is necessary with respect to provision of timely resources and demonstrating his/her leadership, commitment and customer focused services (11). Hospitals level of analyzing care process performance (12) and having regular proficiency testing have positive correlation with Quality management system implementation (13). Further, an organization culture emphasizing standards and values associated with affiliation, teamwork and innovation, assumption of change and risk taking, play as the key success factor in QMS implementation (14).

With respect to the implementation of QMS there is limited information both in well-developed as well as low income countries like Ethiopia. There are only few published literatures that shows about the health institutions level of QMS implementation. Accordingly, only 4% of hospitals in Netherlands, 0% in Hungary and 3% in Finland were found to be implemented QMS (15). In, Lithuanian of Eastern Europe, quality management systems have found operating in 39.7% (16). Also, the study from Iran indicated that the QMS implementation score is 15.3% for public and 20.9% for non-public hospitals (17).

In health care organizations, it is considered as a means to better meet the needs and expectations of patients (18). However, that there are some challenges encountered during the realization of quality management system in public organizations due to the bureaucratic culture, organizational features and ownership affect hospital QMS implementation (19, 20). Additionally, less flexibility in resource allocation and human resources management of government health institutions could leads to difficulty in proper implementation of quality management system. This will prevent the institution from providing of quality healthcare for their clients (7). However, still there is a gap in information that to what extent does health institution has been implementing the quality management system in the perspective clinical staffs. Therefore, this study is aimed to assess the implementation status of QMS and factors affecting it among clinical staffs at government hospitals found in Addis Ababa.

## **Methods And Materials**

### **Study design, period and area**

Institution based cross sectional study design was conducted among 422 study participants from 1<sup>st</sup> to 30<sup>th</sup> of May 2021 at public hospitals in Addis Ababa, Ethiopia. Addis Ababa is capital city of Ethiopia, with a population of 3,384,569 of people in an area of 540 square Kilometers. The city comprises 11 sub cities and 116 districts. The city consists of a total of 13 public hospitals, specifically 6 hospitals owned by Addis Ababa Health Bureau, 5 hospitals owned by Federal Ministry of Health (central), 1 ministry of defense and 1 police force hospitals which provide different health services. Prior to finalizing of the research proposal the researcher was collected human resource related information from Addis Ababa City Administration health bureau. Based on that a total of 4103 clinical staffs are currently working at the selected six public hospitals found in Addis Ababa.

### **Source and study populations**

All clinical health care providers working at governmental hospitals of Addis Ababa city are source population and those who were working in the selected hospitals during the data collection period were the study populations. All clinical health care workers who were working on a fulltime at least for six months at the institution were included and those who were on annual leave during the data collection period were excluded

### **Sample size determination and sampling procedure**

The sample size was calculated using the single population proportion formula, taking the assumptions of 50% of QMS implementation status because there is no previous published data in this area, 95% confidence level & 5% marginal error. The final sample size became 422 after adding 10 % non-response rate. Of a total of six public hospitals in the Addis Ababa City Regional Health Bureau, three hospitals were randomly selected by lotter methods. According to the information obtained from the respective human resource unit of each health institution, total of 4,103 clinical health care providers were providing a medical service at the six hospitals and 1, 778 of them were from the selected three hospitals. Then proportional allocation was used to allocate the numbers of clinical health care providers to be included from each hospital based on the number. Finally, simple random sampling technique was used to select the study participants by using the list of the health professional in the selected hospitals.

### **Data Collection tools and Procedures**

Data was collected by using of self-administered semi-structured questionnaire which was developed after reviewing previous similar studies (18,21). The content of the questionnaire includes socio-demographic characteristics (age, sex, education, marital status, monthly income), qualification and experience related factors (professional qualification, work experience, training on QMS, motivation), institutional related factors (type of the facility, year of establishment, availability of guideline and protocol) and quality management system implementation related factors which is developed from previous different research works. The QMS tool has a total of twelve Likert scale based questions with a value of 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree Four BSc nurses for data collection and one BSc public health professionals for supervisions were recruited.

## **Data Quality Control Issues, Processing and Analysis**

Data quality control issue was insured by conducting pre-test among five percent total samples obtained from health care workers working at Yekatit 12 Hospital to assess the appropriateness of wording, clarity of the questions and respondent reaction to the questions and interviewer. Training was given to the data collectors and supervisors on the data collection tool, sampling techniques and ethical consideration by the researcher prior to the data collection. Supervision was held regularly during data collection period both by the researcher and supervisor. The collected data were checked on daily basis for completeness and consistence by the supervisor and researcher. After cleaning data was entered in to EPI info version 3.1 then it was exported to SPSS versions 25 for analysis. Descriptive statistics (frequencies and percentages) was used to explain the study participant response in relation to study variables. Then it was presented in text, table and graphs. After the dependent variable has been classified in two value based categorical variable based on the overall mean, the bivariate and multivariate analysis was used to determine the presences of statistically significant associations between the independent variables and QMS implementation. Variables which had p-value <0.05 during bivariate analysis were considered for further multivariate analysis to control confounding. The strength of the association was presented by odds ratio (OR), Adjusted Odds Ratio (AOR) and 95% confidence interval. A p value of < 0.05 on multivariate analyses was considered as statistically significant.

## **Result**

### **Socio-demographic characteristics of the respondents**

A total of 422 study participants were included in the study which makes the response rate 100%. The mean age of the respondents was 31.46 (SD = 5.77) years. Among the respondents, the majority (44.5%) were in age of below 30 years, (55.0%) were female and (49.3%) were unmarried. Also, the vast of the study participants which accounts (75.8%) of had a degree level of educational, background. Regarding monthly income of the study participants, around half of them (45%) had a monthly income in the range of 5000 to 7500 Ethiopian birr (Table 1).

Table 1  
-Descriptions of Socio demographic factors of the health care providers at  
governmental hospitals in Addis Ababa, Ethiopia, 2021

Variable	Categories	Frequency	Percent (%)
Age	below 30 years	188	44.5
	30–34 years	139	32.9
	35 years and above	95	22.5
Sex	Male	190	45.0
	Female	232	55.0
Marital status	Married	180	42.7
	Single	208	49.3
	Divorced and widowed	34	8.1
Educational background	Diploma	51	12.1
	Degree	320	75.8
	Masters/specialist	51	12.1
Monthly income	5000 and below	49	11.6
	5001–7500 birr	190	45.0
	above 7500 birr	183	43.4

### **Profession experience and institutional profile related characteristics of the respondent.**

Data were collected regarding to professional experience and institutional profile of the study participants. The result of the study showed that, 48.8% of the study participants were BSc nurse in profession, and more than three-fourth (79.4%) of them were a clinical staff during the data collection period. Also the majority that 45.3% of them had more than five years of overall working experience and (73.9%) of them were ever heard about quality management system. Also, 67.3% of them were not ever taken quality management system related trainings (Table 2).

Table 2

; Profession experience and institutional profile related description of the health care providers at governmental hospitals in Addis Ababa, Ethiopia, 2021.

Variables	Categories	Frequency	Percent (%)
Profession	clinical nurse	55	13.0
	BSC nurse	206	48.8
	HO	22	5.2
	Midwifery	26	6.2
	Pharmacist	22	5.2
	medical doctor	46	10.9
	laboratory technician	40	9.5
	other specify*	5	1.2
	Current position	clinical staff	335
unit/department head		67	15.9
Head and vice head of institution		6	1.4
other specify**		14	3.3
Work experience	2 years and below	83	19.7
	> 2 years to 5 years	148	35.1
	more than 5 years	191	45.3
Ever heard about quality management system	Yes	312	73.9
	No	110	26.1
Ever taken quality management system related trainings	Yes	138	32.7
	No	284	67.3
other specify*(environmental health, Radiography technologists occupational health);			

other specify\*\* (Infection preventions)

## Institutional strategy related factors

Concerning institutional profile related response of the study participants, 65.6% and 58.3% of them were from medical institutions and referral hospitals respectively with respect to the type and hierarchy of the institution. Also, 3.1% of the respondents mentioned that there is QMS guideline/protocol at the

institutions. Almost, half of them (44.8%) did not know whether there is or not availability of Mission regarding quality care delivery. Further, many of them that (43.1%) and 46.4% of the participants mentioned didn't know for the question regarding availability of quality plan of the hospital and availability of departmental quality plan respectively. In addition, the majority of the current study participants were didn't know whether there is or not allocated of availability of budget for quality improvement of the institution which is responded by 55.9% of them (Table 3).



Table 3

; Institutional strategy related response of the study participants at governmental hospitals in Addis Ababa, Ethiopia, 2021

Variables	Categories	Frequency	Percent (%)
Type of institution	academic institution	145	34.4
	medical institution	277	65.6
Hierarchy of the institution	Primary hospital	37	8.8
	General hospital	139	32.9
	Referral hospital	246	58.3
Availability of QMS guideline/protocol	Yes	224	53.1
	No	52	12.3
	I don't know	146	34.6
Availability of Mission regarding quality care delivery	don't know	189	44.8
	not available	89	21.1
	available but not communicated	89	21.1
	available and communicated	55	13.0
Availability of Quality plan of the hospital	don't know	182	43.1
	not available	73	17.3
	available but not communicated t	94	22.3
	Available and communicated	73	17.3
Availability of Departmental quality plan	don't know	196	46.4
	not available	75	17.8
	available but not communicated t	91	21.6
	Available and communicated	60	14.2
Availability of Budget for quality improvement	don't know	236	55.9
	not available	59	14.0

Variables	Categories	Frequency	Percent (%)
	available but separated for quality	73	17.3
	there is a specific budget for q	54	12.8

## Employee Empowerment And Participation Related Response

Employee's empowerment and participation in quality management system related information has been collected for the current study. Based on the response of the current participants 35.8% of them explained that the system is significant but it can't be practically implemented in hospitals. The majority of them (47.4%) said that quality management system committee is established at the institution but not fully functional and 36.0% of them said that it is led by Professionals. Of those, 27.3% of them considered that more than 50% staffs have general information about QMS, whereas 30.6% which accounts 129 of them mentioned that less than 50% of the professional staff are being participated on quality management system activities. For information about training of employees on QMS, the current study finding showed that 33.9% of the study participants thought that training is provided only for case team leaders and 26.3% stated that less than 50% of the staffs with the position of manager received training on QMS. The researcher was also further included information how the study participants saw the system of monitoring employee quality improvement by department heads/case team leaders, as per the finding the majority that 32.0% of them describe even if there is a regular monitoring system but not on standard indicators (Table 4).

Table 4

; Employee level of empowerment and participation in QMS related response of the health care providers at government hospitals, Addis Ababa, Ethiopia, 2021

Variables		Frequency	Percent (%)
QMS in hospital	The system had no significance at all	39	9.2
	Its negative effect is more visible than the positive effect	60	14.2
	The system is significant but it can't be practically implemented in hospitals	151	35.8
	The system creates improved environment in different aspects of the service	122	28.9
	The system is a necessity question for the wellbeing of the hospital	50	11.8
QMS committee status of the hospital	not established	28	6.6
	Established but there is no move	49	11.6
	established but not fully functional	200	47.4
	established and fully functioned	73	17.3
	don't know	67	15.9
	other specify	5	1.2
Main player in the QMS	no one	39	9.2
	quality committee	113	26.8
	Professionals	152	36.0
	staffs in managerial position	76	18.0
	other specify	42	10.0
Staff awareness about QMS	not aware at all	59	14.0
	only < 50% of the staff has information general	97	23.0
	>=50% staffs has general information	115	27.3

Variables		Frequency	Percent (%)
	>=50% staffs has detail information	69	16.4
	Other specify	82	19.4
Participation of professionals in QMS	not participated at all	70	16.6
	< 50% of the staff participated	129	30.6
	50 and more staff participated	107	25.4
	don't know	88	20.9
	other specify	28	6.6
Training for employees on QMS	not provided	57	13.5
	only for case team leaders	143	33.9
	< 50% of the staff provided	92	21.8
	>=50% of the staff provided	46	10.9
	don't know	80	19.0
	other specify	4	.9
Training of managers on QMS	not provided	54	12.8
	< 50% of the staff provided	111	26.3
	>=50% of the staff provided	99	23.5
	don't know	50	11.8
	other specify	108	25.6
Monitoring system on employee quality improvement activities by department heads/case team leaders	not available at all	35	8.3
	the system is available but not regular and standard based	81	19.2
	regular but not on standard indicators	135	32.0
	regular and standard based monitoring system	64	15.2
	don't know	107	25.4

## Quality Management System Implementation Status Of The Study Participants

Quality management system implementation status was measured as it is described at section four operational definition part by using a Likert scale based twelve questions. The finding showed that an overall quality management implementation status was 47.2% (Fig. 1).

### **Factors associated with level of quality management system implementation among health care providers of governmental hospitals**

For each explanatory variable, bivariate analysis was done and socio-demographic factors such as age of 30–34 years as well as above 35 years and monthly income of having above 7500 Ethiopian birr; professional and experience related factors such as being nursing profession and ever heard about quality management system; further institutional related factors such as working at general and referral hospitals and availability of MQS guideline/protocol were variables fulfilled the minimum requirement of p-value < 0.05 significance level for implementation of quality management system for further multivariate logistic analysis. For those variables which have p-value of less than 0.05 were entered to multivariate analysis to check the true association. On the multivariate analysis; Health care providers of age 35 years and above (AOR 1.99, 95%CI (1.18, 3.39)), those who were ever heard about QMS (AOR 1.56, 95%CI (1.01, 2.51)), and staffs who knows the availability of QMS (AOR 2.31, 95%CI (1.20, 4.43)) were among the variables that had showed significant association with implementation of quality management system (Table 5).

Table 5

; Factors associated with level of quality management system implementation at governmental hospitals in Addis Ababa, Ethiopia, 2021

Explanatory Variables	QMS implementation status		COR,95%(CI)	AOR,95%(CI)	P-value
	Not Implemented	Implemented			
Age					
below 30 years	117	71	1	1	
30–34 years	65	74	1.88 (1.20, 2.93)*	1.57 (0.98, 2.52)	0.062
35 years and above	41	54	2.17 (1.31, 3.59)*	1.99 (1.18, 3.39)**	0.010
Monthly Income					
5000 and below	31	18	1	1	
5001–7500 birr	111	79	1.23 (0.64, 2.34)	1.35 (0.69, 2.67)	0.381
above 7500 birr	81	102	2.17 (1.13, 4.15)*	1.79 (0.90, 3.56)	0.096
Profession					
Nurses	148	113	1	1	
Other professions	75	86	1.50 (1.01, 2.23)*	1.35 (0.88, 2.06)	0.165
Ever hear about QMS					
Yes	153	159	1.82 (1.16, 2.85)*	1.56 (1.01, 2.51)**	0.045
No	70	40	1	1	
Hierarchy of the institution					
Primary hospital	26	11	1	1	
General hospital	68	71	2.47 (1.13, 5.38)*	1.95 (0.86, 4.42)	0.108
Referral hospital	129	117	2.14 (1.02, 4.53)*	1.89 (0.87, 4.11)	0.110
Availability QMS guideline/protocol					

\* Significant association (p-value < 0.05 in bivariate)

\*\*-significant association (p-value < 0.05 in multivariate analysis)

Explanatory Variables	QMS implementation status		COR,95%(CI)	AOR,95%(CI)	P-value
	Not Implemented	Implemented			
Yes	101	123	2.30 (1.23, 4.32)*	2.31 (1.20, 4.43)**	0.012
I don't know	88	58	1.25 (0.64, 2.41)	1.35 (0.68, 2.70)	0.394
No	34	18	1	1	
* Significant association (p-value < 0.05 in bivariate)					
**-significant association (p-value < 0.05 in multivariate analysis)					

Other professions = Medical doctors, health officers, pharmacy professionals, laboratory professionals, midwiferies

## Discussion

The finding of this study revealed that an overall 47.2% of quality management system at the selected hospitals. This result is in line with the previous study finding where it was reported in Lithuanian support treatment and nursing hospitals that the currently implementation of QMS is 46.6% (19). However, the current study finding is higher than the previous study findings which were done different part of Europe that a mean of 22 QM-activities per hospital was found in the Netherlands and Finland versus 20 QM activities in Hungarian hospitals. Further, only 4% of hospitals in Netherlands, 0% in Hungary and 3% in Finland have already implemented a QMS (15). Also, it was higher than the finding from Isfahan University Hospitals (IUHs) of Iran, that implementation status was very low, low, medium and highly successful respectively in 16.7, 58.3 and 8.3 percent of the hospitals (22). The difference might be due to the variation in sample size and study population that was included a total of 276 hospitals as a study setting and directors of the hospitals or the quality coordinators as study populations (15), and total of 667 employees and 12 hospital managers were included at IUHs study (22).

With respect to associated factors, the current study found that those who were in the age categories of 35 years and above were 1.99 times more likely to considered quality management system has been implemented as compared to those below the age of 30 years. This could be because of exposing to different management related activities and updating themselves through education through time. An organization which creates an opportunity like teamwork, innovation, assumption of change and risk taking, play as the key success factor in QMS implementation of employees' (14). Also, education and training, responsibility and teamwork and ongoing improvement problem prevention have a positive implementation of QMS (15).

Further, those who ever heard about QMS were 1.56 times more likely to perceived that QMS was implemented in relation to those not ever heard about it. This is supported by different studies that knowledge of the staff and training (17, 23, 24, 25, 26) had a significant association with QMS implementation.

In addition, the current study found that those who mentioned there is available quality management system guideline or protocol were 2.31 times more likely considered that QMS has implemented at the institution. This might be due the available protocol helps the staffs to judge about the current status of QMS at the institution. The most critical issues related to the QMS implementation include procedure development, information, and development of work guidelines (19). Organizational culture like having developed QMS guideline has a significant effect on QM practice (24). The other systematic review study has also mentioned that an organization culture emphasizing on standards and values associated with key success of QMS implementation (14). Further, the level of compliance in guideline has an effect on quality management system implementation (27).

## **Limitation Of The Study**

Since, there was a limited published data regarding the current research topic it was difficult to make a comprehensive and detail comparison with other previous study findings. Also, it is quantitative data based only. Unable to get a validated tool of the dependent variable in Ethiopia context.

## **Conclusion And Recommendation**

In the current study areas, the level of quality management system implementation is not satisfactory. Many number of the study participants' didn't know about their hospitals strategies with respect to settled mission, quality plan and allocated budgets for quality management system. Only few study participants know that QMS necessities for the institution. Based on the majority of the study participants' response more than 50% of the professionals have not currently being participated on QMS related activities. Also, only, around ten percent of the employees' received training on QMS and one-fourth of study participants didn't know whether there is or not a system of monitoring employee quality improvement by department heads/case team leaders. Therefore, Addis Ababa health bureau should develop a mechanism which help to enhance level of QMS at hospital levels. The health institutions/hospitals should desensitize to all staff members about the available QMS guidelines or protocols if there is but if there is no protocol the institutions should develop a protocol/guideline. Training on QMS should be given for staffs. The QMS committee should be multidisciplinary and should announce to all staffs while it has established. Generally creating a suitable environment that helps staffs to know about QMS of the institution including its mission, plan and budget is a mandatory.

## **Declarations**

### **Ethics approval and consent to participate**



Ethical clearance was obtained from Kotebe Metropolitan University Menelik Health Science College IRB, Ethiopian FMOH IRB and Addis Ababa regional health bureau Ethical Review Committee. In addition, permission letter was obtained from the study site. Prior to data collection, written consent was obtained from all study participants and were informed that participation was voluntary and they can withdraw themselves from the study at any time. Data were kept confidential and anonymous and it was used only for the research purpose. The study participants were informed that there is no harm due to participating in the study. The confidentiality of the study participants' related data were maintained by avoiding possible identifiers such as name of the participants. Only identification number was used as a reference.

So, in general we carried out the current research by fulfilling **all the requirements of the institutional** Kotebe Metropolitan University Menelik Health Science College IRB, Ethiopian FMOH IRB and Addis Ababa regional health bureau Ethical Review Committee **guidelines and regulations and also it fulfilled the** Declaration of Helsinki.

### **Consent for publication**

Not applicable

### **Availability of data and materials**

Raw data were generated at public hospitals in Addis Ababa city, Ethiopia. Derived data supporting the findings of this study are available from the corresponding author YG and co-author MM, AK, and MAK. This is also to confirm you that there is hardcopy of ethical approval letter that we have got it from Kotebe Metropolitan University Menelik Health Science College IRB, Ethiopian FMOH IRB and Addis Ababa regional health bureau Ethical Review Committee after the research proposal had been reviewed and approved. The collected hardcopy questionnaires are available with the principal investigator YG, whereas the softcopy of SPSS data is currently available among some of the co-investigators such as MAK by keeping it in confidential.

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### **Authors' contributions**

YG was conceived the study and involved in developing the proposal, the study design, reviewed the article, analysis, report writing and drafted and write up the manuscript; MM and AK were involved in reviewing the proposal, result and manuscript as well as providing constructive comments after reviewing of the proposal and final paper; ZMG and MAK were involved in reviewing of the final thesis paper as well as developing the manuscript.

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## Competing interest

All authors read and approved the final manuscript. The authors declare that they have no competing interests.

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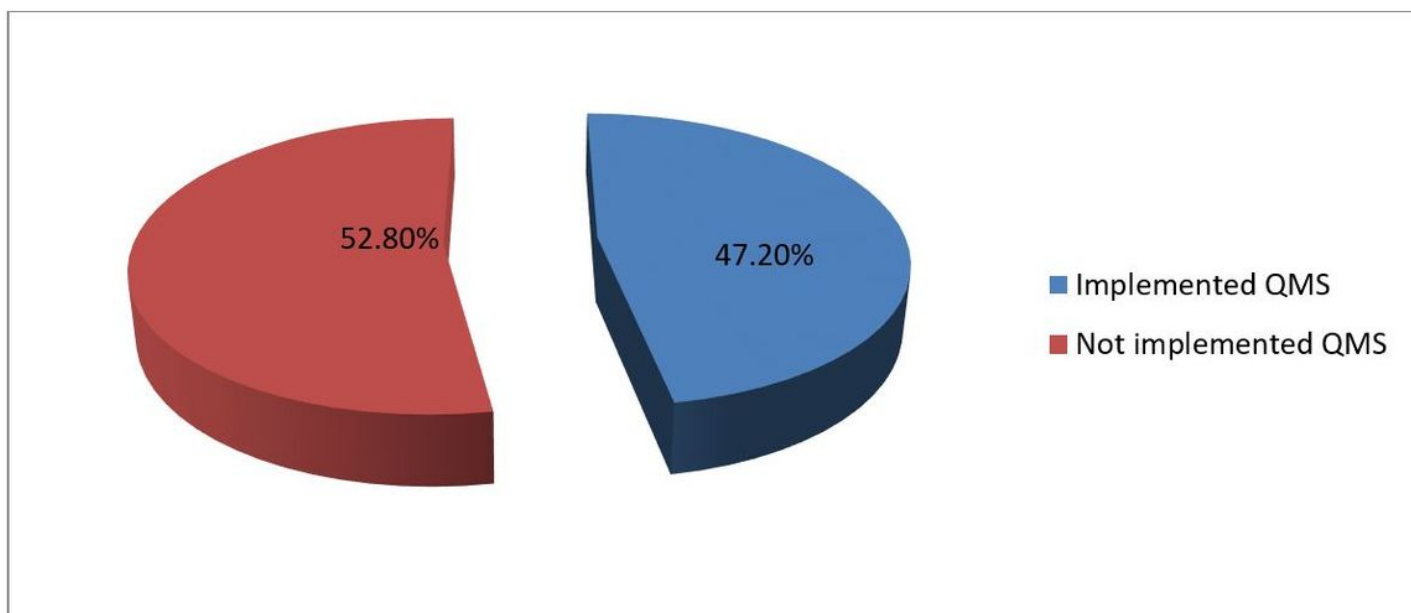
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## Figures



**Figure 1**

Quality management system implementation status at governmental hospitals in Addis Ababa, Ethiopia, 2021