

# Patient Safety Assessment at Primary Health Care Centers in Cairo, Egypt

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**Abstract:** Background: Patient safety at primary health care centers (PHCC) is rarely assessed, particularly in developing countries. Objectives: This study aimed to assess some items of patient safety program at primary health care centers, Cairo, Egypt. Methods: A cross sectional study was carried out on primary health care centers (PHCC) in Cairo, from January through March 2016 to assess the quality of some patient safety items. Two PHCC were selected randomly from the health affairs directorate of Nasr city, Eastern Cairo (El-Hagana family medicine center and 6<sup>th</sup> district family medicine center). The data were collected through interviewing and observing technique using structured questionnaire containing the quality items. The used questionnaire and interview checklist were developed and formulated according to the WHO patient safety and OSHA self inspection checklist. Scoring of the studied items are done and compared between the two studied centers using statistical test with p value of significance was set at  $\leq 0.05$ . Results: There were statistically significant differences between the studied family medicine centers with regard to some studied patient safety goals where the higher compliance was achieved in the 6<sup>th</sup> district center. For the studied quality improvement requirements, however, there was no statistically significant difference between the studied centers for almost all studied items. Comparison of compliance of the studied centers with the criteria of access, there was statistically significant difference regarding most of the studied items of this topic with the highest compliance was observed in 6<sup>th</sup> district center, although no one of the studied centers has met all the studied characteristics of that topic. Assessing the availability and uses of personal protective equipment (PPE), the study findings showed a variation among the studied centers. Only one third of the clinics of El-Hagana center showed a compliance with PPE. Conclusion: Patient safety at primary health care centers has to be reviewed and assessed periodically. There are need to carry national large study to assess quality of patient safety program in PHCC all over the country.

**Keywords:** Patient Safety, Personal Protective Equipment Primary Health Care, Egypt

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## 1. Introduction

Patient safety is defined as the prevention of harm caused by errors of commission and omission [1]. One-fifth of the people in the community are exposed to medical mistakes, and this rate may be as high as 35–42% [2]. As a result, millions of people may die or suffer injuries due to preventable medical errors. Patient safety practice refers to processes or structures which, when applied, reduce the probability of adverse events resulting from exposure to the health-care system across a range of diseases and procedures. Every patient has the right to be treated using the safest technology available in health facilities. Therefore, all health-care professionals and institutions have obligations to

provide safe and qualified health care and to avoid unintentional harm to patients [3].

Patient safety is not a new concept for health care practitioners; discussion of this issue started as early as 1954 with the publication of a paper by Beecher and Todd, a study of the deaths associated with anesthesia and surgery. As a result of the concern about mortality rates, a concerted focus on research was made, and standardization and safety controls were applied in anesthesia machines. This was an early example in health care in which the concept of patient safety was addressed [4].

Since 1990, the Institute for Healthcare Improvement (IHI) has led healthcare improvement including medication error reduction and improvement of prescribing practices. IHI teams

addressed improvement in the intensive care unit, delays in the emergency department, and clinical conditions such as asthma. Lessons learned from these series are routinely shared in educational forums, publications, and online reports [5]. The economic benefits of improving patient safety are compelling. Studies show that additional hospitalization, litigation costs, infections acquired in hospitals, lost income, disability and medical expenses have cost some countries between US\$ 6 billion and US\$ 29 billion a year [6].

The area of primary health care concerns everyone in the community because it provides the first contact for the patient. However, since severe and complicated cases requiring special treatment are handled in hospitals, both providers and the community frequently underestimate the importance of primary healthcare services. This underestimation leads to a primary care environment susceptible to errors in fields such as organization, physician notification, and communication and staffing [7]. The widespread nature and heavy consequences of medical mistakes require more studies focusing on patient safety. However, these types of studies generally concentrate on hospital environments [7, 8].

From this point of view, this study aimed to assess the quality of patient safety program at primary health care centers through assessment of compliance of the studied centers with the international patient safety goals, quality improvement requirement, access and continuity of services.

## 2. Methods

The present cross sectional study was carried out on two primary health care centers (PHCC) in Cairo, from January through March 2016 to assess the quality of patient safety program at the studied PHCC.

The study setting was selected by multistage sampling technique through the following two stages: the first stage included the random selection of one health affairs directorate in Cairo (health affairs directorate for eastern Cairo). The 2<sup>nd</sup> stage included random selection of two PHCC from the chosen directorate. The randomly selected

PHCC were: El-Hagana family medicine center and 6<sup>th</sup> district family medicine center at Nasr city where all clinics of the studied centers were studied (Medicine, MCH, Surgery, Dentist, Emergency room and laboratory). The studied centers were visited weekly during the study period.

The data were collected through interviewing and observing technique using special questionnaire containing the research items. The used questionnaire and interview checklist were developed and formulated according to the WHO Patient safety [6, 9], OSHA self inspection checklist [10], and the Joint Commission [11]. The questionnaire included the following patient safety aspects: patient safety goals (14 items), quality improvement requirements (12 items), criteria of access (12 items), criteria of providing continuity of services (17 items), and the availability and the use of personal protective equipment (PPE) in the clinics. A formal official letter was issued and addressed to the directors of selected PHCC before conduction of the study. The letter explained the objectives and expected benefits of the present study and requesting the permission to conduct the study.

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data was presented using descriptive statistics in the form of percentages for qualitative variables. The studied patient safety aspects and its related items were given score and then the compliance of the clinics in each studied center were compared using chi square and Fischer exact test as appropriate. The statistical significance of the comparison in this study was set at  $p\text{-value} \leq 0.05$ .

## 3. Results

Table 1 showed the compliance of the studied PHCC with the international patient safety goals. The study results showed no statistically significant differences among the studied centers regarding the goals 1 and 2 and none of the studied centers has achieved compliance of in all studied departments. Regarding goals 3, 4, and 5; there have been statistically significant differences among the studied centers with the higher compliance was achieved in 6<sup>th</sup> district family medicine center.

**Table 1.** Compliance of the Studied PHCC with patient safety goals.

Patient safety Goals	6 <sup>th</sup> district family medicine center No. clinic %		El-Hagana family medicine center No. clinic %		P value
<b>Goal 1: Identify Patients Correctly</b>					
1. A collaborative process is used to develop policies and/or procedures that address the accuracy of patient identification.	3	50.0	3	50.0	0.13
2. Patients are identified before administering medications, blood or blood products.	4	66.7	3	50.0	
3. Patients are identified before taking blood and other specimens for clinical testing.	4	66.7	5	83.3	
4. Patients are identified before providing treatments and procedures.	4	66.7	2	33.3	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.20
<b>Goal 2: Improve Effective Communication</b>					
1. A collaborative process is used to develop policies and/or procedures that address the accuracy of verbal and telephone communications.	3	50.0	2	33.3	0.10
2. The complete verbal and telephone order or test result is written down by the receiver of the order or test result.	6	100.0	3	50.0	
3. The complete verbal and telephone order or test result is read back by the receiver of the order or test result.	5	83.3	3	50.0	
4. The order or test result is confirmed	5	83.3	3	50.0	

Patient safety Goals	6 <sup>th</sup> district family medicine center No. clinic %		El-Hagana family medicine center No. clinic %		P value
by the individual who gave the order or test result.					
<b>Clinics that meet all items</b>	4	66.7	2	33.3	0.34
<b>Goal 3: Improve the Safety of High-Alert Medications</b>					
1. A collaborative process is used to develop policies and/or procedures that address the location, labelling, and storage of concentrated electrolytes.	4	66.7	1	16.6	0.02*
<b>Clinics that meet all items</b>	4	66.7	1	16.6	0.02*
<b>Goal 4: Reduce the Risk of Healthcare-Associated</b>					
1. A collaborative process is used to develop policies and/or procedures that address reducing the risk of health care associated infections.	5	83.3	2	33.3	0.01*
2. The organization has adopted or 0.012 adapted currently published and generally accepted hand hygiene guidelines.	5	83.3	3	66.7	
3. The organization implements effective hand hygiene program.	3	50.0	2	33.3	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.10
<b>Goal 5: Reduce the Risk of Patient Harm Resulting from Falls</b>					
1. A collaborative process is used to develop policies and/or procedures that address reducing the risk of patient harm resulting from falls in the organization.	4	66.7	2	33.3	0.01*
2. The organization implements a process for the initial assessment of patients for fall risk and reassessment of patients when indicated by a change in condition, medications, etc.	5	83.3	4	66.6	
3. Measures are implemented to reduce fall risk for those assessed to be at risk.	5	83.3	4	66.6	
<b>Clinics that meet all items</b>	5	83.3	3	50.0	0.04*

\*Significant

Table 2 showed the compliance of the studied centers with the quality improvement requirements. No statistically significant differences were observed among the studied centers with regard to the studied items of quality improvement requirements. However, the highest compliance was detected in 6<sup>th</sup> family medicine center.

*Table 2. Compliance of the studied PHCC with quality improvement requirements.*

Patient safety Goals	6 <sup>th</sup> district family medicine center No. clinic %		El-Hagana family medicine center No. clinic %		P value
<b>Those responsible for governing and leading the organization participate in planning and monitoring a quality improvement and patient safety program.</b>					
1. Those who govern participate in planning and monitoring the quality improvement and patient safety program.	3	50.0	3	50.0	0.65
2. Clinical leaders participate to plan and carry out the quality improvement and patient safety program.	5	83.5	3	50.0	
3. Managerial leaders participate to plan and carry out the quality improvement and patient safety program.	4	66.7	4	66.7	
4. There is a written plan for the quality improvement and patient safety program.	3	66.7	2	33.3	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.20
<b>The leaders provide technological and other support to the quality improvement and patient safety program.</b>					
1. The leaders understand the technology and other support requirements for tracking and comparing monitoring results.	5	83.5	3	66.7	
2. The leaders provide technology and support, consistent with the organization's resources, for tracking and comparing monitoring results	5	83.5	3	66.7	0.83
<b>Clinics that meet all items</b>	5	83.3	3	50.0	0.41
<b>The quality improvement and patient safety program is coordinated, and program information is communicated to staff.</b>					
1. The organization's quality improvement and patient safety program is coordinated.	3	50.0	2	33.3	0.03*
2. Information regarding the organization's quality improvement and patient safety program is communicated to the staff at least quarterly.	4	66.7	2	33.3	
3. Both managerial and clinical staff closest to the activities being monitored, studied, or improved; participate in quality improvement and patient safety activities.	3	50.0	2	33.3	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.05
<b>All staff members are trained to participate in the program.</b>					
1. There is a training program for staff that is consistent with their role in the quality improvement and patient safety program.	5	83.3	3	66.7	0.01*
2. A knowledgeable individual provides the training.	5	83.3	3	66.7	
3. Staff members are permitted to participate in the training as part of their work assignment.	3	50.0	1	16.7	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.30

\*Significant

Table 3 presented the comparison of compliance of the studied PHCC with the criteria of access. There was statistically significant difference regarding most of the studied items of this topic with the highest compliance was observed in 6<sup>th</sup> district family medicine center. However, no one of the studied centers has met all the studied characteristics of that topic.

**Table 3.** Compliance of the studied PHCC with criteria of access.

Patient safety Goals	6 <sup>th</sup> district family medicine center		El-Hagana family medicine center		P value
	No. clinic		No. clinic	%	
Patients have access to ambulatory services based on their assessed health care needs and the ambulatory care organization's mission and resources.					
1. Screening is initiated at the point of first contact.	4	66.7	4	66.7	0.65
2. Based on screening, the patient is matched with the organization's mission and resources.	3	66.7	2	33.3	
Clinics that meet all items	3	50.0	2	33.3	0.10
The organization has a process for registering patients for treatment.					
1. Policies and procedures are used to standardize the patient registering process	4	66.7	2	33.3	0.02*
2. Staff members are familiar with the policies and procedures and follow them	5	83.3	3	50.0	
3. The policies and procedures address the registering of emergency patients.	5	83.3	3	50.0	
4. The policies and procedures address the management of patients when space is not available for the desired service	4	66.7	2	33.3	
Clinics that meet all items	4	66.7	2	33.3	0.01*
The organization initiates and maintains a clinical record for every patient assessed or treated.					
1. A clinical record is initiated for every patient assessed or treated by the organization.	5	83.3	2	33.3	0.04*
2. Patient clinical records are maintained through the use of an identifier unique to the patient.	4	66.7	2	33.3	
Clinics that meet all items	4	66.7	2	33.3	0.02*
Patient information is confidential and protected from loss or misuse.					
1. The organization respects patient health information as confidential.	3	50.0	2	33.3	
2. Policies and procedures to prevent the loss of patient information are implemented.	4	66.7	1	16.7	0.02*
3. Policies and procedures to prevent the misuse of patient information are implemented.	3	50.0	1	16.7	
4. There is a process for patients to grant release of patient information.					
Clinics that meet all items	3	50.0	1	33.3	0.03*

\*Significant

Table 4 showed the study findings about the compliance of the studied centers with providing continuity of services requirements. There have been variations about the compliance with this topic among the studied hospitals. The highest compliance was in 6<sup>th</sup> district family medicine center with statistically significant differences was detected for the following studied criteria namely; the availability of information about patient's care, patient's records and facilitating records of exchange of information.

**Table 4.** Compliance of the studied PHCC with criteria of providing continuity of services.

Patient safety Goals	6 <sup>th</sup> district family medicine center		El-Hagana family medicine center		p value
	No. clinic	%	No. clinic	%	
<b>During all phases of care, there is a qualified individual identified as responsible for the patient's care.</b>					
1. The individual responsible for the patient's care is identified.	3	50.0	3	66.7	0.40
2. The individual is known to the patient and family.	5	83.3	2	33.3	
3. The individual is known to the hospital's staff.	5	83.3	3	50.0	
<b>Clinics that meet all items</b>	3	50.0	2	33.3	0.80
<b>Information about the patient's care and response to care is shared among medical, nursing, and other care providers.</b>					
1. Information exchanged includes the patient's health status.	5	83.3	2	33.3	0.02*
2. Information exchanged includes a summary of the care provided.	5	83.3	3	50.0	
3. Information exchanged includes the patient's progress.	4	66.7	1	16.7	
4. When a transfer occurs, the reason for the transfer is communicated.	4	66.7	2	33.3	
<b>Clinics that meet all items</b>	4	66.7	2	33.3	0.03*
<b>There is a process to appropriately refer patients to other providers or health care settings for continuing care.</b>					
1. There is an organized process to refer patients.	4	83.3	3	50.0	0.30
2. The referral is based on the patient's needs for continuing care.	4	66.7	3	50.0	
<b>Clinics that meet all items</b>	4	66.7	3	50.0	0.30
<b>The organization cooperates with health care practitioners and outside agencies to ensure timely and appropriate</b>					
1. The organization becomes familiar with the health care providers in its community.	3	50.0	2	33.3	0.02*
2. Referrals outside the organization are to specific individuals and agencies in the patient's home community whenever possible.	5	83.3	1	16.7	
<b>Clinics that meet all items</b>	4	66.7	2	33.3	0.06
<b>Patients and, as appropriate, their families are given understandable follow up instructions.</b>					
1. Follow-up instructions are provided in an understandable form and manner.	4	50.0	2	33.3	0.15
2. The instructions include any return for follow-up care.	5	83.3	3	50.0	
3. The instructions include when and how to obtain urgent care.	5	83.3	3	50.0	
4. The instructions include relevant health education.	4	66.7	3	50.0	
5. Families are also provided the instructions, as appropriate to the patient's condition.	4	66.7	4	66.7	
6. Instruction provided to patient and their families are appropriately documented in the medical record.	4	66.7	3	50.0	
<b>Clinics that meet all items</b>	4	66.7	3	50.0	0.37

\*Significant

Assessing the availability and uses of personal protective equipment (PPE), the study findings showed a variation among the studied centers. There was no statistically significant difference observed, although the availability and uses of PPE was high almost in all clinics of 6<sup>th</sup> district family medicine center and it was the lowest in El-Hagana family medicine center with only one third of its clinics showed a compliance with PPE.

#### 4. Discussion

Patient safety has become a major policy for the healthcare organizations. In this study, structured questionnaires were used to assess patient safety in two PHCC of health affairs directorate of Nasr city, Eastern Cairo, Egypt, with emphasis on the compliance with patient safety and quality improvement, access, and personal protective equipment.

The study showed that compliance with international patient safety goals was significantly different among the studied centers except in the first and second goals. It was observed that in almost all goals; 6<sup>th</sup> district family medicine center had higher compliance international patient safety goals and which may be attributed to higher budget and strict supervision and audit from the managers also due to continuous training and inspections and for sure due to application of total quality management principles. Also, the 6<sup>th</sup> district family medicine center was established earlier compared with the other studied center and this may be attributed to the experience gained by 6<sup>th</sup> district center. On the other hand, El-Hagana family medicine center, the rate of compliance was low specially usage of collaborative process to develop policies and/or procedures that address the accuracy of patient identification.

This was in agreement with Harvard studies in New York and in Utah and Colorado by about 60% as they quantify the patient safety problem and they found that many departments of hospitals and health care centers at the studied area were not fully compliance with International Patient Safety Goals and there was significant discrepancy in compliance between ICU department 90% and other departments 30-65% in those hospitals [12,13]. According to Texas Health Quality Institute, and the Texas Medical Association, along with other health care entities across the US, including the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), the National Committee for Quality Assurance has emphasis that all hospital departments should comply with the International Patient Safety Goals not less than 80% [14].

Overall, the mean score of patient safety culture in primary healthcare units is lower than that of hospitals [16]. However, perception of patient safety culture by health staff members resulted in similar scores. Because primary healthcare institutions have a lower potential for life-threatening medical errors and procedures and as most risky medical interventions take place in hospitals, hospital staff may have better training and specialization in safety-related issues. This may account for the relatively lower reporting of problems

regarding patient safety in hospitals compared with primary care. On the other hand, because the medical risk is estimated to be lower in primary healthcare units, patient safety precautions might be neglected or disregarded in those institutions due to the 'low risk' potential, which may lead to the development of unexpected threats.

Regarding Compliance with Quality Improvement requirements among the studied PHCC, all items were not significantly different except in coordination between (patient safety program and Quality Improvement) and (training to participate in program), 6<sup>th</sup> district family medicine center was relatively good at the compliance with quality improvement requirements that may be due to continuous training and inspections and due to application of total quality management principles and quality control prior to the other studied center and with more experience managers in the field of quality control but there were defect of compliance with item of patient safety program coordination, and program information is communicated to staff.

Three studies done by California (one) and Harvard (two) were single year reviews performed on 20,864, 31,000, and 14,700 inpatient records, respectively, from 23, 51, and 28 hospitals, and they found that there were many items regarding Quality Improvement requirements those hospitals not complied with and this was in agreement with our result but on other hand they found good compliance with coordination of the program & staff communication in contradictory with our result [3]. In this study, the compliance with criteria of access showed is significantly difference between the studied centers for about half of its studied items and the same was also detected for compliance with criteria of providing continuity of services, compliance with criteria of transfer for continuing care, compliance with informed consent criteria and compliance with criteria of patient and family education. The study also reported fairly good compliance with criteria of all communication items and sub-items in the studied 6<sup>th</sup> district center and accepted compliance in El-Hagana family medicine center.

The average percentages of clinics in the studied center that comply were 66.7% for the 6<sup>th</sup> district center and vary from 50% to 66.7% in El-Hagana center. These results indicate lack or inefficiency of the training activities and the supervision system and the need for corrective actions to enhance communication system and communication skills of health care workers of the studied hospitals.

In agreement with our study Thomas & Buckley [16] found that there was great difference in hospitals at the studied area compliance to the criteria of communication ranged from (16% to 88%) especially patient education and good instruction for transference and also there were differences inside the same hospitals among department regarding compliance.

Occupational health safety criteria were assessed in this study by the assessment of the availability and use of personal protective equipment. The studied 6<sup>th</sup> district center

had the higher compliance to the studied items of PPE in nearly its entire clinics compared with El-Hagana center. In the later center, only one third of its clinics were found to use PPE.

Occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards [10]. Occupational health refers to the identification and control of the risks arising from physical, chemical, and other workplace hazards in order to establish and maintain a safe and healthy working environment. These hazards may include chemical agents and solvents, heavy metals such as lead and mercury, physical agents such as loud noise or vibration, and physical hazards such as electricity or dangerous machinery [9].

The present study suggested that the patient safety survey used in hospitals can be modified and employed in outpatient clinics. Some items could be revised according to primary care services for which inter-item reliability is low [17]. To assess patient safety in health organization, structured questionnaires and semi-structured interviews are often used in mixed method studies to generate confirmatory results despite differences in methods of data collection, analysis, and interpretation [18].

In conclusion, PHCC in Cairo may need to improve the patient safety culture in primary healthcare services to reach the benchmark values for safety culture level and event reporting frequency. Also, the development of a patient safety culture should be a priority of administrators in primary healthcare units, as it is in hospital settings. An environment in which healthcare staff can report present or possible errors without fear of punishment should be established. Finally, development of a positive safety culture in primary healthcare services requires further study based on large national project including large number of PHCC all over Egypt.

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