Assessment of Patient Safety Culture in Primary Healthcare Services in Alexandria, Egypt

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Abstract: *Background*: Patient safety is a critical component of healthcare quality. This study aimed at assessing the perceptions of primary healthcare staff members about patient safety culture and explores the areas of deficiency and opportunities for improvement concerning this issue.

Methods: This descriptive cross sectional study surveyed 328 staff members in 28 primary healthcare facilities in Alexandria using an anonymous direct structured interview format of a modified "Hospital Survey on Patient Safety Culture" adopted questionnaire. The total number of respondents was 250 participants (response rate = 76.2%). The main outcome measures include patient safety culture score including sub scores on 12 dimensions and 42 items; patient safety grade, number of events reported and factors contributing to the adverse events.

Results: The overall median% score for perception of patient safety culture at the facility level was 68.6%. After controlling of the confounders; being female respondent, being physicians or nurses or midwives, having long experience in PHC service and receiving education and training about safety issues were positively associated with positive response on patient safety culture scale. The domains with the highest positive score and are thus considered areas of strength were teamwork within units (80.0%), management support for patient safety (80.0%), supervisor expectations and actions promoting patient safety (75.0%) and handoffs and transitions (75.0%). Dimensions scoring the lowest and as such can be considered areas requiring improvement were overall perceptions of patient safety, frequency of events reported and staffing (60% give positive response for each). More than two-fifths (43.6%) did not report any events in the 12 months preceding the survey. The difference between professions regarding the most common procedure that causes adverse event is statistically significant. Patients' related factors such as ignorance and socio cultural acceptance were reported to be the most common factors contributing to the adverse events (92.4% of the studied participants reported that).

Conclusions: Improving patient safety culture should be a priority among health center administrators. Healthcare staff should be encouraged to report errors

Keywords: Safety culture, patient safety, primary healthcare, medical errors.

INTRODUCTION

Patient safety is a critical component of healthcare quality. It is defined as 'the prevention of harm caused by errors of commission and omission'. Patient safety culture is described as the common values, beliefs, behaviors, perceptions and attitudes of the staff in a healthcare center [1]. As healthcare organizations continually strive to improve, there is a growing recognition of the importance of establishing a culture of safety. Achieving a culture of safety requires an understanding of the perceptions about what is important in an organization and what attitudes and behaviors related to patient safety are expected and appropriate [2].

Unsafe healthcare remains a problem of immense magnitude worldwide. While the past decade has witnessed remarkable progress towards improved patient safety, many gaps still exist and harm inflicted on patients by adverse healthcare events remains unacceptably high. Research studies have shown that an estimated average of 10% of all inpatient admissions result in a degree of unintended patient harm. It is estimated that up to 75% of these lapses in healthcare delivery are preventable. In addition to human suffering, unsafe healthcare exacts a heavy economic toll. Indeed, it is estimated that between 5% and 10% of expenditure on health is due to unsafe practices that result in patient harm. Most of this is due to system failures rather than the actions of individuals [3].

The area of primary healthcare (PHC) 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 PHC services. This underestimation leads to a primary care environment susceptible to errors in fields such as organization, physician notification, communication and

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staffing [4]. Thus, some studies have found that errors in primary care can result in serious consequences [5, 6]. Primary healthcare units need an "organizational safety culture" similar to that established in hospitals [7]. An institutional culture involves the procedural flow in a given institution; a safety culture is one in which safety is everyone's concern [8].

The generation of a safety culture starts with an evaluation of the present safety level in an institution because safety precautions implemented without a proper assessment may elevate costs and also causing unpredicted new risks [9]. Many tools have been developed for evaluation of the patient safety culture. Nearly all these tools cover five common dimensions of patient safety climate: leadership, policies and procedures, staffing, communication and reporting [10].

WHO has been working with Egypt Ministry of Health and Population (MOHP), Egyptian universities, research institutes and hospitals to promote the Patient Safety friendly Hospital Initiative. It has collaborated with various partners to establish the Alexandria Patient Safety Alliance, which represents an alliance between the various healthcare stakeholders in Alexandria. From 2010 to 2011, WHO implemented a work plan in collaboration with the MOHP to expand implementation of the Patient Safety Friendly Hospital Initiative in six hospitals in three governorates as a pilot for potential implementation in all Egypt in 2012–2013. Nurses have been trained in hospitals and PHC centers on patient safety and guidelines for nurses on patient safety developed and implemented [11].

Patient safety culture is a relatively new area, and most of the studies published in this field are based on studies of hospitals [12]. There is a scare knowledge about patient safety culture in primary healthcare services and to our knowledge, none conducted previously in Alexandria, Egypt. This study was conducted to assess safety culture in PHC services in Alexandria from PHC providers' perspectives.

SUBJECTS AND METHODS

A descriptive cross sectional survey was conducted in PHC services in Alexandria city during the period from 1st October 2013 to 31st December 2013. The target population was four categories of full-time PHC professionals; physicians (family physicians, general practitioners, family planning physicians, and primary care specialists), nurses/ midwives, health officers (any clerk that has direct contact with patient and involved in administrative procedures) and other professions (pharmacists, dentists and technicians). A multistage stratified random sampling technique was used to choose 20 % (n = 28) out of the total primary healthcare settings in Alexandria (n = 137) [Health Affairs Information data, 2013]. Stratification was based on health districts and rural, suburban and urban locales in Alexandria. The total targets were 1492 whereas the 20% of this number was 298 and 10% was added for a non-response so the total required sample was 328 PHC participants. Proportional recruitment of participants continued till reaching the required number from each facility. Respondents excluded from the survey are those who answered less than one entire section of the survey or fewer than half of the items throughout the entire survey (in different sections) or if every item's response is the same (e.g. all "4s" or all "5s").

Data were collected through an anonymous direct structured interviewing method. A pilot-tested interview format was used to collect the following data:

- Socio demographic and professional characteristics.
- Patient safety culture survey: a modified Arabic-translated Hospital Patient Safety scale (HSOPSC), that was developed by the Agency for Healthcare Research and Quality (AHRQ) was used [13]. The modified scale contains 12 subscales and 42 items that consider many attributes known to be associated with a culture of patient safety.

1. Teamwork within Units (4 items).
2. Supervisor/Manager Expectations and Actions Promoting Patient Safety (4 items).
3. Organizational Learning-Continuous Improvement (3 items).
4. Management Support for Patient Safety (3 items).
5. Overall Perceptions of Patient Safety (4 items).
6. Teamwork across Units (4 items).
7. Staffing (4 items).
8. Handoffs and Transitions (4 items).
9. Non-punitive Response to Errors (3 items).
10. Feedback and Communication about Error (3 items).
11. Communication Openness (3 items).
12. Frequency of Events Reported (3 items).

The HSOPSC is a valid and reliable instrument developed from previous literature, cognitive tests and factor analyses to assess the patient safety culture in hospitals. The Arabic translated modified form was tested on randomly selected 40 PHC providers for reliability using Cronbach's α for each subscale and for the total composite scale (α = 0.71).

Moreover, respondents were inquired about how many incident reports have been generated in the past 12 months and common types of errors that cause adverse events. They were also asked to agree or disagree about factors contributing to the adverse events.

Ethical clearance for this study was obtained from the Research Ethics Committee of Alexandria Faculty of Medicine. All study procedures were carried out in accordance with the Declaration of Helsinki regarding research involving human subjects. An informed consent was included. Autonomy and confidentiality were assured before obtaining their approval to participate.

Data Management

Data were fed to the computer using SPSS (version 20.0, Chicago, IL). For patient safety scale, items were worded in both positive and negative directions. Negatively worded items were first reverse coded. Each item in the first 9 dimensions was rated on 5-point Likert scale ranging from 5=strongly agree to 1=strongly disagree. While each item in the last 3 dimensions was rated on 5-point Likert scale that ranging from 5=always to 1=never. For each positively worded item, the percentage of positive responses was calculated, i.e. the percentage of respondents answering the question as 'strongly agree' and 'agree' or 'always' or 'most of the time'. Similarly, for each negatively worded item, the percentage of negative responses was calculated. In addition, the median for each subscale was calculated. Percent score was calculated as % of total score in relation to maximum possible score. In all cases, the possible range of scores is from 0 to 100%, with higher scores indicating a more positive response.

Descriptive statistics were used to summarize the outcome variables. Appropriate inferential statistics were done with chosen 5% level of significance. Monte Carlo Chi square test was used to compare PHC professions on each of the 42 safety culture items, and on composite scores of the safety culture grades. Kruskal Wallis non-parametric and Post Hoc Tests were used to compare mean patient safety culture domain (%) score between different professions. The association between respondents' characteristics and patient safety culture positive score was explored using backward multivariate logistic regression analysis with a positive response on patient safety culture scale as the dependent variable.

RESULTS

Background Characteristics of PHC Staff

In total, 250 PHC staff completed the survey (response rate 76.2%). In Table **1**, age ranged between 22 and 59 years. The median age was 35 years. Vast

Table 1: Background Characteristics of PHC Staff in Alexandria

Socio-demographic and professional characteristics	PHC staff (n=250) (%)
Age (years)	
20-29	28.4
30-39	29.2
40-49	34.0
50-59	8.4
Min-Max	22-59
Median (25^{th}-75^{th} percentile)	35 (29-44)
Gender	
Male	10.0
Female	90.0
Marital status	
Never married	18.0
Ever married	82.0
Qualification	
Physicians	38.8
Nurses	20.4
Midwives	2.4
Health officers	8.0
Other*	30.4
Duration of work experience (years)	
1-9	43.2
10-19	24.4
20- 40	32.4
Min-Max	1- 37
Median (25^{th}-75^{th} percentile)	10.0 (5.8-21.0)

Table 1 Contd...

Socio-demographic and professional characteristics	PHC staff (n=250) (%)
Duration of experience in primary care facility (years)	
1-9	58.8
10-19	25.6
20- 40	15.6
Min-Max	1-35
Median (25^{th}-75^{th} percentile)	7.5 (4.0-15.0)
Time worked in the facility (hours/week)	
< 12	1.6
12-23	16.8
24-35	1.6
36-48	80.0
Min-Max	6-48
Median (25^{th}-75^{th} percentile)	36 (36-36)
Received education and training about safety issues	
No	40.4
Yes	59.6

*Other includes: pharmacists, dentists and technicians.

majority of the participants were females (90.0%). The majority were ever married (82.0%). More than a third (38.8%) were physicians, 20.4% were nurses, only 2.4.0% were midwives and 8.0% were health officers. Other professions constituted 30.4%. The median duration of work experience was 10.0 years. The median duration of experience in primary care service was 7.5 years. The median hour of working per week was 36 hours. Nearly two-fifths of the PHC staff (40.4%) did not receive any education or training about the safety issues.

Patient Safety Culture Domains

The overall median% score for perception of patient safety culture at the facility level was 68.6%. The twelve domains of patient safety culture were examined to determine areas of strength and those requiring improvement (Figure **1**). The domains with the highest positive score and are thus considered areas of strength were teamwork within units (80.0%), management support for patient safety (80.0%), supervisor expectations and actions promoting patient safety (75.0%) and handoffs and transitions (75.0%). Dimensions scoring the lowest were overall perceptions of patient safety, frequency of events reported and staffing (60% give positive response for each).

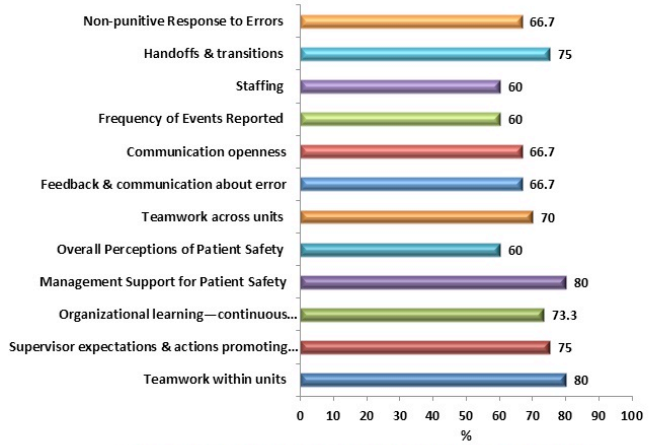

Figure 1: Median patient safety culture domain scores (% score) of PHC staff in Alexandria.

Patient Safety Culture Items

In Table **2**, all items within the dimensions of teamwork within units, supervisor/manager expectations and actions promoting patient safety, organizational learning-continuous improvement, management support for patient safety, handoffs and transitions and non-punitive response to errors were areas of strength.

Table 2: Distribution of PHC Staff in Alexandria (n = 250) by their Response on Patient Safety Culture Scale

Patient safety culture scale		Positive response (%)
Domain	**Items**	
Teamwork within units [α =0.8]	People support one another in this unit.	76.0
	When a lot of work needs to be done quickly, we work together as a team to get the work done	88.0
	In this unit, people treat each other with respect.	75.2
	When one area in this unit gets really busy, others help out.	71.2
Supervisor/Manager Expectations and Actions Promoting Patient Safety [α=0.559]	My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.	78.4
	My supervisor/manager seriously considers staff suggestions for improving patient safety.	68.0
	*Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts.	31.6
	*My supervisor/manager overlooks patient safety problems that happen over and over.	11.2

Table 2 Contd….

Patient safety culture scale		Positive response (%)
Domain	**Items**	
Organizational Learning-Continuous Improvement [α=0.470]	We are actively doing things to improve patient safety.	78.4
	Mistakes have led to positive changes here.	71.6
	After we make changes to improve patient safety, we evaluate their effectiveness.	62.0
Management Support for Patient Safety [α=0.372]	Unit management provides a work climate that promotes patient safety.	70.8
	The actions of unit management show that patient safety is a top priority.	81.6
	*Unit management seems interested in patient safety only after an adverse event happens.	22.8
Overall Perceptions of Patient Safety [α=0.36]	Patient safety is never sacrificed to get more work done.	4.8
	Our procedures and systems are good at preventing errors from happening.	60.8
	*It is just by chance that more serious mistakes don't happen around here.	52.4
	*We have patient safety problems in this unit.	19.2
Teamwork across Units [α=0.764]	There is good cooperation among units that need to work together.	57.2
	Units work well together to provide the best care for patients.	66.0
	*Units do not coordinate well with each other.	22.4
	*It is often unpleasant to work with staff from other units.	16.4
Feedback and communication about error [α=0.544]	We are given feedback about changes put into place based on event reports.	37.2
	We are informed about errors that happen in this unit.	50.0
	In this unit, we discuss ways to prevent errors from happening again.	56.0
Communication openness [α=0.672]	Staff will freely speak up if they see something that may negatively affect patient care.	52.8
	Staff feels free to question the decisions or actions of those with more authority.	38.0
	*Staff is afraid to ask questions when something do not seem right.	10.0

Table 2 Contd…

Patient safety culture scale		Positive response (%)
Domains	**Items**	
Frequency of Events Reported [α=0.818]	When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	36.0
	When a mistake is made, but has no potential to harm the patient, how often is this reported?	25.2
	When a mistake is made that could harm the patient, but does not, how often is this reported?	20.8
Staffing [α=0.653]	We have enough staff to handle the workload.	40.4
	*Staff in this unit works longer hours than is best for patient care.	35.6
	*We use more agency/temporary staff than is best for patient care.	10.8
	*We work in "crisis mode" trying to do too much, too quickly.	59.2
Handoffs and Transitions [α=0.795]	*Things "fall between the cracks" when transferring patients from one unit to another.	23.2
	*Important patient care information is often lost during shift changes.	6.8
	*Problems often occur in the exchange of information across primary healthcare service.	7.6
	*Shift changes are problematic for patients in primary healthcare service.	12.8
Non-punitive Response to Errors [α=0.816]	*Staff feels like their mistakes are held against them.	14.8
	*When an event is reported, it feels like the person is being written up, not the problem.	22.0
	*Staff worry that mistakes they make are kept in their personnel file.	27.2
Composite score [α=0.71]	Min-Max (Median, (25^{th}, 75^{th} percentile)	48.1-86.7 68.5 (60.3-76.7)

-Percent score was calculated as % of total score in relation to maximum possible score.

-Negatively worded questions were reversely coded.

-* indicates reversed worded items.

- α = reliability coefficient.

However, areas requiring improvement pertained to the dimension on overall perceptions of patient safety whereby respondents claimed that patient safety is never sacrificed to get more work done (only 4.8% positive) and 47.6% indicated that it is just by chance that more serious mistakes don't happen around here. In addition, 60.8% of the staff claimed that their

procedures and systems are good at preventing errors from happening.

Areas requiring improvement pertained to teamwork across units whereby only 57.2% of staff indicated that there is good cooperation among units that need to work together.

Areas requiring improvement pertained to the dimension on feedback and communication about error whereby respondents reported that they are given feedback about changes put into place based on event reports (only 37.2% positive), 50.0% only reported that they are informed about errors that happen in this unit and 56.0% indicated that they discuss ways to prevent errors from happening again.

Areas requiring improvement pertained to the dimension on communication openness whereby respondents positively reported that staff freely speak up if they see something that may negatively affect patient care (only 52.8%) and 38.0% indicated that the staff feels free to question the decisions or actions of those with more authority.

Areas requiring improvement pertained to the dimension on frequency of events reported whereby only 36.0% of respondents confirmed that when a mistake is made, but is caught and corrected before affecting the patient, it is always reported. Only a quarter of the staff always report when a mistake is made, but has no potential to harm the patient and 20.8% mentioned that they always report when a mistake is made that could harm the patient, but does not.

Areas requiring improvement pertained to the dimension of staffing whereby only 40.8% of respondents positively reported that they work in "crisis mode" trying to do too much, too quickly and only 40.4% indicated that they have enough staff to handle the workload.

Patient Safety Culture Grade

A minority of the participants (1.0%) rated the overall patient safety in the work unit "excellent" (> 85% score) and nearly a fifth (21.0%) rated the level of patient safety as "very good" (75-<85% score) (Figure **2**).

The Relationship between Patient Safety Composite Score and PHC Staff Characteristics

The outcome of patient safety composite score was put into two categories “Poor or Failing, grade ≤ 60%

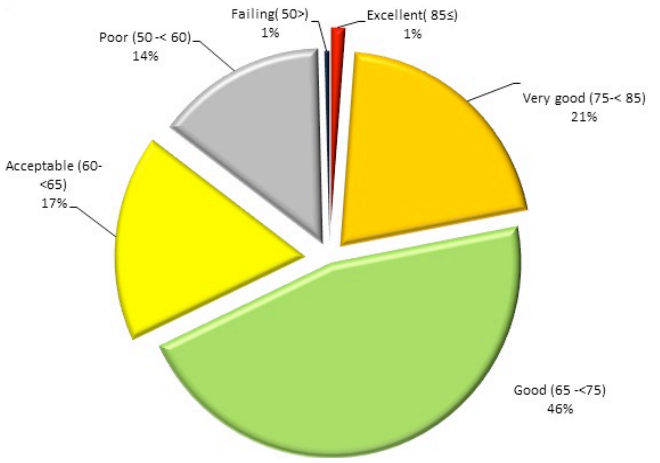

Figure 2: Distribution of PHC staff in Alexandria by patient safety culture grade.

Table 3: Multivariate Logistic Regression Analysis of Potential Predictors of Positive Response on Patient Safety Culture Scale for the Studied PHC Staff in Alexandria (n = 250)

Independent variables	Adjusted OR (95% CI)	P-value*
Gender		
Male	1	
Female	1.50 (1.39 - 3.65)	*<0.001**
Age (years)		
Less than 20	1	
20 -29	0.91 (0.89 - 0.93)	*<0.001**
30 -39	0.74 (0.48 – 1.16)	0.188
40 -49	0.72 (0.47 – 1.27)	0.193
50 - 59	0.66 (0.49 - 0.89)	*0.006**
Qualification		
Physician	2.68 (1.68 - 4.69)	*<0.001*
Nurse/midwives	1.96 (1.11 - 3.59)	*0.001*
Health officers	1.18 (0.97 - 1.43)	0.102
Others	1	
Duration of experience in PHC (years)		
1- 9	1	
10-19	1.01 (0.75 - 1.36)	0.928
20-40	1.13 (1.09 - 1.17)	*<0.001**
Time worked in the facility (hours/week)		
< 12	1	
12 -23	0.67 (0.57 - 0.79)	*<0.001**
24- 35	0.85 (0.30 - 2.35)	0.748
36 – 48	0.37 (0.06 - 2.16)	0.270
Received education and training about safety issues		
No	1	
Yes	2.68 (1.39 - 4.90)	*0.004**

- Independent (predictor) variables were socio demographic and professional factors
- Dependent (criterion) variable: - response on patient safety culture scale coded as positive response (1), negative response (0)
- R^2 value is 0.851, X^2 = 29.463, p < 0.001.

score = negative response," and "Acceptable/Good/ very good/excellent" grade > 60% score= positive response." As presented in Table **3**, after controlling of the confounders; 85.1% of the variability in patient safety is explained by including the socio demographic and professional variables in the model (R^2 = 0.851) with overall significant model X^2 = 29.463, p < 0.001. Thus being female respondent, being physicians, nurses/midwives, having long experience in PHC service and receiving education and training about safety issues were positively associated with positive response on patient safety culture scale. However, respondents aged between 20 and <30 years and those aged between 50 and <60 years and time worked in the facility between 12 and 24 hours per week had lower odds of positive response on patient safety culture scale.

Views of the Studied PHC Staff Regarding Adverse Events

In Figure **3**, less than half of the respondents (43.6%) did not report any events in the 12 months preceding the survey and 29.2% acknowledged

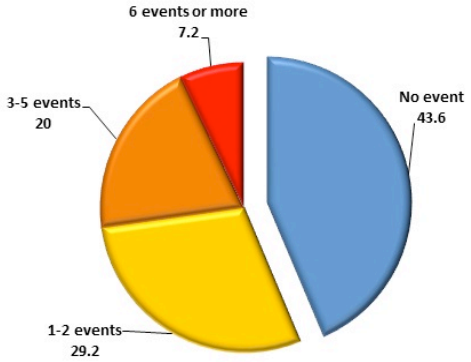

Figure 3: Number of adverse events reported during 12 months preceding the survey by the PHC staff of Alexandria.

reporting 1 to 2 events. A fifth reported 3 to 5 events. Only 7.2% tended to report 6 events or more. Non-reporting of adverse events seemed to be more among other professions (65.8%) and physicians (44.3%). In Figure **4**, nearly a third of the studied participants indicated that medication (31.2%) and diagnosis (30.0%) were the common procedures that caused adverse events among the clients. The difference between professions regarding the common procedure that causes adverse event is statistically significant, ^{MC}p <0.001.

Figure **5** depicts that patients' related factors such as ignorance and socio cultural acceptance seemed to be the most common factors that contributed to the adverse events (92.4% of the participants claimed that). Moreover, 80.8% mentioned that defective equipment or shortage of the supplies and 79.6% stated inadequate education and training. Statistical significant differences are observed between different professions regarding factors contributing to the adverse events. Inadequate education and training was acknowledged by more health officers (85.0%) and other professions (85.5%). Inadequate communication or reporting was acknowledged by more health officers (70.0%). Delay in providing service was acknowledged by more other professions (30.3%).

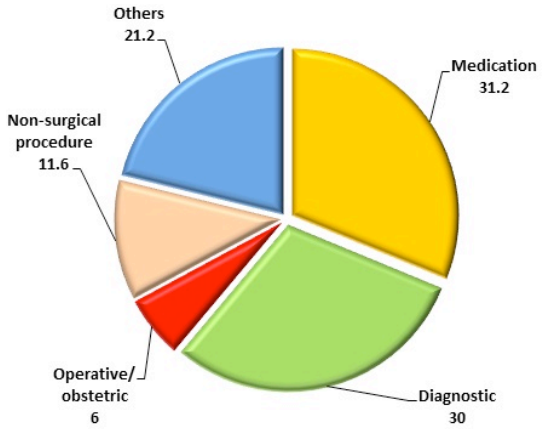

Figure 4: Distribution of PHC staff in Alexandria by commonest procedure that causes adverse events.

DISCUSSION

The purpose of this study is to stimulate discussion about patient safety in PHC in Alexandria. The study aimed at raising the awareness of these issues, and supports coordinated national action to address them [14].

To date, the present survey is one of the first to elucidate providers' views on patient safety culture during daily primary care. The response rate (76.2%) was acceptable and run counter to the results from previous studies [15-17]. Moreover, the study was carried out in urban, suburban and rural PHC facilities of Alexandria, the sufficient sample size used, four groups of healthcare staff were included, and all these strengthen the generalizability and also pose a variation in the sample.

In the present work, the median perception composite score of patient safety culture in PHC facilities (68.6%) was lower than that of the results obtained from hospitals [18]. This indicated that primary healthcare institutions have a lower potential for life-

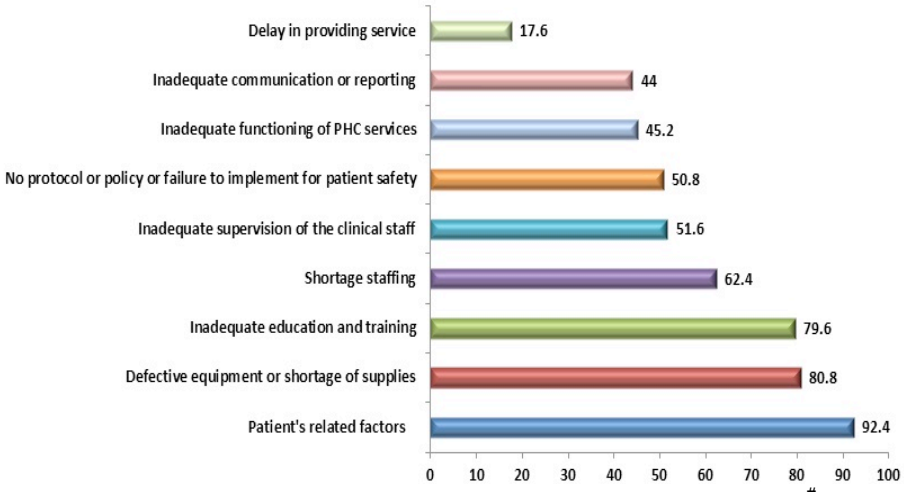

Figure 5: Views of PHC staff in Alexandria regarding factors contributing to the adverse event. #Patient's related factors such as: ignorance, sociocultural acceptance. -Multiple responses were ticked. Categories are mutually not exclusive.

threatening medical errors and procedures. As most risky medical interventions take place in hospitals. Thus, hospital staff may have better training and specialization in safety-related issues. 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 [19].

Assessing the current safety culture in primary care practice is the first step to target improvements. This study aimed at exploring the areas of deficiency and opportunities for improvement concerning patient safety culture in PHC setting. The results identified three patient safety dimensions with low positivity. These were: overall perceptions of patient safety, frequency of events reported and staffing. In this unsafe culture, people will not be enthusiastic to report the adverse events due to fear of punishment, absence of error acknowledgement and obstruction of any possibility of learning from error [20].

In accordance, Ghobashi *et al.* in Kuwait (2014) [21] indicated that several safety culture dimensions are potential areas for improvement but with prioritization. These are non punitive response to errors (24%) which is the worst safety dimension, frequency of event reporting (32%), staffing (41%), communication openness (45%) and center handoffs and transitions (47%). The lowest two dimensions "non-punitive response to error (24%)" and "frequency of event reporting (32%)" appears to be closely related to each other because of the "blame and shame" culture where failure is punished or concealed and people refuse to acknowledge that problems exist.

The main results of this study showed that perception of patient safety culture differed in relation to staff characteristics. Staff with longer experience within the healthcare scored higher than those with shorter experience, indicating patient safety culture strengths. This result was in line with El-Jardali *et al.*, in Lebanon (2010) [22], where more experienced healthcare staff scored higher for the patient safety culture dimensions regarding event reporting and overall safety. This finding might be explained by the fact that the staff with short experience had not adapted to the existing culture, and thus were able to have a more critical attitude to prevailing lack of safety.

Although, the present study indicated that the domain of non-punitive response to error achieved higher score; which means that PHC providers in Alexandria are at ease when it comes to reporting errors. The current work indicated that 43.6% of the staff did not report any events in the past year preceding the survey. It was comparable to the study in Saudi Arabia (43.0%) [23]. The high rate of event non-reporting may be attributed to the fear of keeping errors in the person file and the culture that when a mistake happens [24]. For instance, development of error reporting system based on voluntary and consistent event reports is recommended to improve patient safety in PHC services [25].

The scores of non-punitive response to error and adverse event reporting dimensions were higher than the results of a similar study done in 12 PHC centers, surveying 180 staff member in Turkey [26]. Indeed, in Ain-Shams University hospitals, Egypt, non-punitive response to error reached only 19.5% positivity while adverse event reporting and recording was only 33.4% [27].

In this work, training opportunities that empower physicians and other professions to improve patient safety are limited (40.4% did not receive any education and training about the safety issues). The WHO has since endorsed a patient safety competencies framework for healthcare professionals to enhance local patient safety training programs [28].

Given the outstanding role medications play in the origin of adverse events (31.2% acknowledged medication errors), it seems necessary to set out recommendations on the further enhancement of the training of PHC physicians in the proper handling of medications, to standardize the presentation of the information on the medications. Improvements in communicating/informing patients in order to better their adherence seems to be a pressing need for improving the safety of the healthcare provided [29].

In contrast to the present results, the Kuwaiti study [21] reported that the overall patient safety was rated as excellent or very good by the majority of respondents (85%), and overall perception of patient safety is moderately positive as around 69.0% claimed that patient safety is never sacrificed to get more work done. Similar finding was also reported in a study in Saudi Arabia including 13 general hospitals in Riyadh city [30].

Having a strong, capable, and motivated workforce is one of the biggest challenges for healthcare facilities today [23]. In the present work, staffing, a major component of patient safety, received a low score (60% positive response). However, this figure is higher than that of a study on a 239 nursing staff in Iran which achieved only 38% positivity as regards staffing dimension [31].

One of the study's limitations was that the instrument used in this study to measure patient safety culture that developed for hospitals (4). Although, it was adapted and used in outpatient settings to stimulate learning about safety culture and to facilitate team communication. Yet, some items should be revised according to primary care services for which inter-item reliability is low ($\alpha < 0.7$). The present study recommends further modification for the tool to be used on a wide scale in the practical situations. However, development of a new instrument aimed specifically at the primary healthcare services provided by outpatient clinics and preventive medicine is needed as a better solution. Also a non- respondent analysis for 23.8% of the non-respondents is recommended in organizational survey studies. This was not feasible in the current study as the study tool was anonymous. However the later recommendation is of importance only if non-respondents are treated as a different population.

In conclusion, despite that the overall patient safety culture among Alexandria primary care professions on average was perceived positively yet, patient safety grade was rated as excellent or very good by less than one-fourth of the respondents. Thus is not as strong as for the provision of safe healthcare. Results indicated that important aspects of the patient safety culture in these PHC need improvement. This is an important challenge to all stakeholders wishing to improve patient safety.

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