

Patient Safety: Assessing Nurses' Perception and Developing an Improvement Plan

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Abstract: patients' safety is a core value of healthcare service. A positive patient safety culture contributes to the environment necessary to maintain patient safety and avoid needless patient deaths. The impact of medical errors has been widely reported. The traditional blame and shame culture in healthcare organization have been criticized for being largely responsible for causing medical errors and obstructing the possibility of learning from those errors. Employees' perceptions about safety are important because organizations with strong safety culture consistently report fewer workplace injuries and fewer harmful events than do organizations with weak safety culture. The study aims to assessing nurses' perceptions of patient's safety culture at medical and paediatric hospitals and developing an improvement plan to enhance patient safety at the study settings. The study was conducted in tow university hospitals using a descriptive design. **Sample:** 148 nurses (120 staff nurses and 28 head nurses) were included in the study. **Tools of the study included** 1) Interview questionnaire sheets were used to collect the participants' characteristic data, 2) The Hospital Survey of Patient Safety Culture (HSPSC) developed by the Agency for Healthcare Research and Quality, AHRQ (2004). **Results:** nurses perceive patient safety culture more positive. There were statistically significant differences between perception of nurses working in critical care units and perception of nurses working in general wards in two dimensions. There were a statistically significant differences between perception of the staff nurses and perception of head nurses in all items related to patients' safety except organizational learning. The highest percentages of the nurses working in the general wards and critical care units scored their hospital as very good (59.5% & 33.7%, respectively). While half of the head nurses scored the hospital as acceptable (50%). The highest percentage of the staff nurses (34.2%) reported no events related to patients safety over the past 12 months. No correlation was found between head nurses age and perception of patient safety culture, while there was a positive weak correlation between staff nurses' age and their perception. **Conclusion:** nurses perceive patient's safety culture more positively. There was a statistically significant difference between nurses working in critical care units and nurses working in general wards. Head nurses perceived the patient's safety culture more positively than staff nurses did. The majority of the nurses did not report events related to patient's safety. Non-punitive environment scored high negative responses. **Recommendation:** nurses need to be encouraged to improve the reporting events related to patients' safety. Further studies are needed for testing the reliability of the suggested developed improvement plan and accordingly implementing it at the study settings.

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1. Introduction:

Patient safety is considered as one of the most important aspects of the healthcare. It is a global issue, affecting countries at all levels of development. It has been defined by several organizations as the freedom from accidental or preventable injuries produced by medical care (Institute of Medicine, (IOM), 1999; and Agency for Healthcare Research and Quality (AHRQ), 2005). According to a World Health Organization (WHO) report, one out of every 10 hospital patients in many developed countries experiences an adverse event which can lead to serious injury and death. The situation in developing countries is even worse (WHO, 2008).

Care is often delivered in a pressurized and fast-moving environment, involving a vast array of

technology, and daily decisions and judgments by health-care professional staff. In such circumstances, things can and do go wrong. Sometimes unintentional harm comes to a patient during a clinical procedure, or as a result of a clinical decision. Errors in the process of care can result in injury. Sometimes the harm that patients experience is serious and sometimes people die. Various studies have investigated the extent of adverse events (AbdEl-Rahman, 2004; Johnstone & Kanitsaki, 2006; WHO; 2008, and Markowitz, 2009).

Although estimates of the size of the problem are scarce, particularly in developing and transitional countries, it is likely that millions of patients worldwide suffer disabling injuries or death every year due to unsafe medical care. Patient harm

can occur as a result of a constellation of factors and circumstances. Understanding the magnitude of the problem and the main contributing factors that lead to patient harm is essential to design effective and efficient solutions for different contexts in addition to establishing a safer health system (Al-Ameri; 2000 and Milligan, 2007).

Because today's health-care context is highly complex, describing the safety culture in hospitals is an important first step in creating work environments where safety is a priority. It is a core component of healthcare quality. The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures (Boyden et al., 2006).

Additionally, Safety culture refers to the "summary of perceptions that employees share about the safety of their work environment. Employees' safety-related perceptions are based on several factors, including management decision making, organizational safety norms and expectations, and safety practices, policies, and procedures. These factors all communicate an organization's commitment to safety (Milstead, 2005, Stone and Gershon 2006).

Organizations with strong safety culture have fewer employee injuries not only because the workplace has well developed an effective safety program, but also because the existence of these programs sends "cues" to employees regarding to management's commitment to safety. Evidence shows that if the organization is serious about adherence to safe work practices, then employees are more likely to comply. Safe environment support and reinforces individual safety behaviors, and this in turn further affects behavior because of the influence workers have on one another. As safety behaviors are adopted throughout an organization, increasing pressure is put on non-compliers to come "in line" (Al-Kahtani, Lund & Aaro; 2004; and Chiang & Pepper, 2006).

Hospital employees' perceptions regarding to safety are rarely formally evaluated or considered during the design or updating of safety programs. This issue is particularly important for the health care workplace because recent studies have linked global measures of a safety culture to employee compliance with safe work practices and to exposure to incidents, because exposure to incidents, regardless of the

outcome, may be extremely burdensome to employees as well as to organizations. Improving the understanding of safety climate may have far-reaching implication. (David et al., 2005; and Espin et al., 2006).

Patient safety culture is a relatively new concept in healthcare organizations. Several key features of safety cultures have been identified as applicable to health care organizations based on the studies of high reliability organizations such as nuclear power industry and naval aviation (AHRQ, 2008). These key features include: (1) A system view: Management recognizes risk is inherent in an organization's activities, and analyzes risks and errors systematically; (2) A blame-free and forgiveness environment: Individuals are willing to report errors without a fear of punishment; (3) A collaborative environment: Individuals and work groups or units collaborate effectively to accomplish organizational goals; (4) Adequate safety resources: Organizations are willing to provide resources for addressing safety concerns (Pizzi & Nash, 2001; Milstead, 2005; and David et al., 2005).

Starting point for improving safety culture is to conduct an assessment of the current culture to determine whether and how it affects patient care. A survey of the safety culture should measure aspects of the units that affect patient safety as well as attitude of clinicians and staff members. Such aspects include perceptions of leadership commitment to patient safety, the degree to which teamwork and open communication prevail, and attitudes about non-punitive response to error (Hofman and Mark, 2006; and Shostek, 2007).

Significance of the study:

patients' has become both a national and international imperative in recent years, with increased emphasis across the world on patient safety in policy reform, legislative changes and development of standards of care driven by quality improvement initiatives.

Studies of adverse events in numerous countries around the world demonstrate that, between 4% and 16% of patients admitted to hospital experience one or more adverse events, of which, up to half are preventable. Understanding why preventable errors occur is key to develop strategies by which they can be addressed and minimized. It is self-evident that safe and effective treatments and care are important in ensuring that patients get the best outcomes from their care. The international evidence also indicates that effective care is often the most efficient care (Commission of Safety and Quality Assurance report, 2008).

Aim of the study:

The study aims at assessing nurses' perceptions of patients safety culture at Medical and Paediatric University Hospitals and developing an improvement plan to enhance patient safety at the study settings.

Research questions:

Are there any differences between nurses working in critical care units and nurses working in general wards regarding their perception of patient safety culture?

Are there any differences between staff nurses and head nurses regarding their perception of patient safety culture?

2. Methodology**Design:**

A descriptive design was used in the conduction of the study.

Setting

The study was conducted in all critical care units and general wards in Medical and Paediatric University Hospitals. The medical hospital includes nine critical care units with 70 beds and 13 general wards with 400 beds. While the paediatric hospital includes three critical care units with 30 beds and five general wards with 124 beds.

Subjects:

Subjects of the study included all nurses working in critical care units and general wards in both medical and paediatric university hospitals. Total number of nurses was 250 working in three shifts. Out of the total number, 148 nurses were agreed to respond to the questionnaire representing 59.2%. Participants included 28 head nurses and 120 staff nurses. They include 83 staff nurses working in critical care units out of them 53 nurses from the medical hospital and 30 from paediatric hospital plus 37 from general wards out of them 20 working in the medical hospital and 17 nurses working in paediatric hospital. The inclusion criterion was that head nurses and staff nurses should be working at the current nursing units and position for at least 12 months.

Tools of data collection:

The following two tools were used :

Interview questionnaire sheet was used to collect the participants' characteristic data, such as; age, sex, experience, position and contact with patients. It was also used to collect organizational data such as safety training information, characteristics of the hospital, type of patients services provided.

The Hospital Survey of Patient Safety Culture (HSPSC) employed to measure nurses' perceived patient safety culture in this study, The HSPSC was adopted from Agency for Health care Research and Quality (AHRQ) 2004. It contains 12 dimensions with 42 sub items in addition to two independent questions on patient safety grade and number of events reported with single response item. Out of the 12 dimensions, two outcome dimensions including 1) Frequency of Reported Events with 3 items and 2) Overall perceptions of patient safety with 4 items. And Eight safety culture dimensions at unit level including: 1) Supervisor/manager expectation and actions promoting safety culture with 4 items , 2) organizational learning with 3 items 3) teamwork within hospital units with 4 items , 4) communication openness, with 4 items 5) feedback and communication about errors, 3 items, 6) non-punitive response to error, with 3 items, 7) Staffing with 3 items 8) hospital management support for patient safety, with 3 items , in addition to two hospital-wide safety culture dimensions including 1) teamwork across hospital units, with 4 items, and 2) hospital handoffs and transitions, with 4 items. The reliability has been examined and Cronbach's alpha ranged from 0.63 to 0.84 for each of the 12 safety culture dimensions.

Scoring system:

The instrument uses a five-point Likert scale, ranging from strongly disagree to strongly agree (or always to never). Scoring system ranged between 5 for strongly agree to 1 for strongly disagree. Positive and negative scores were calculated. The positive response percentage is the combined percentage of respondents who answered "Strongly Agree" or "Agree," or "Always" or "Most of the Time" (negative items were reversely coded before the actual calculation). Accordingly, the negative response percentage is the combined percentage of respondents who answered "Strongly Disagree" or "Disagree," or "Never" or "Rarely." The average positive percentage response score for each cultural dimension was obtained by averaging the positive response percentage on the items within that dimension.

Procedures

An official permission from each of the hospital administrative authority was obtained. Data was collected in the period from February 2009 to July 2009. A pilot study to confirm a conceptual match was carried out on five ICU head nurses and nine general ward nurses who participated and reviewed the survey instrument item by item, to find whether there were misconceptions or misunderstandings. Few items were modified based

on their comments. Nurses who were asked to respond to the instruments during the pilot study were excluded from the main study sample. Validity of the survey instruments were judged by five experts to test the feasibility and applicability of the tools. Some clarifications were added to some items. Then, the questionnaire was distributed and the purpose of the study was explained to nurses in their work settings during their shifts. Those who refused to participate in the study were replaced by other nurses. Responses to the questionnaire were collected within three weeks after several hospital visits by the investigators.

Based on the results of the survey a suggested improvement plan to enhance patient safety was developed by the investigators. The plan was distributed among seven members of a jury group including three nursing professors, three directors of general hospitals and the head of quality assurance unit at a University Hospitals for determining the validity of the suggested improvement plan. Based on the feedback of the jury modifications were made to reach to the final developed patient safety plan

Ethical considerations

The study was approved initially by the administrative authority of the University Hospitals. Verbal approval from each participant was obtained prior to the study conduction and after explanation of the purpose of the study. They were informed about their rights to withdraw at any time and that all data will be kept confidential. The permission to use the study tools and instruction sheet was obtained with written online permission from AHRQ research committee via online after explanation of the purpose of the study.

Statistical analysis:

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.0 for Windows. Subjects, for whom 10% or more data were missing, were excluded from the analysis. Analyzing and scoring sheets of the AHRQ were followed in tabulation and calculation. Number and percentage distribution were used to determine the highest responses and chi square-test was used to identify significant differences among nurses' perception. The confidence level chosen for the study was 95%. The differences were considered significant if the p-value was less than 0.05 at the appropriate degrees of freedom. Pearson correlation analysis was used for assessment of interrelationship among quantitative variables and scores, to assess the relationship between nurses' perception as dependent variable and nurses' age and years of experience as independent variable

3. Results:

As evident in table (1) the highest percentage of staff nurses (63.2%), their age ranged between >20 - <30 years with a total mean age of 30.58 ± 8.6 , while more than half of head nurses (53.6%), their age ranged between 30-<40 years, with a mean age of 39.2 ± 7.9 . Results also showed that 37.5% and 71.5% of the staff nurses and head nurses respectively had a Bachelor degree in nursing. The highest percentage of staff nurses held a diploma degree (55.8%). As regards the years of experience it was found that, 71.5% of the head nurses and 40% of staff nurses had experience between 10-<20 years in nursing. Almost all staff nurses (94.6%) had direct contact with patients.

A summary of the average of nurses positive and negative response's percentage for each dimension of the HSPSC is presented in Table (2). The highest positive response (28.9%) obtained by staff nurses working in critical care units related to supervisor/manager expectation and actions promoting safety culture dimension while the lowest (16.9%) was obtained for the non-punitive responses to error. The same table shows that the highest positive response (29.7%) for nurses working in general wards was obtained in four dimensions; overall perception of patient safety, teamwork within hospital units, non-punitive response to error and teamwork across hospital unit. While the lowest percentage (10.8%) was for the frequency of reported events. Regarding head nurses, the same table shows that, the highest positive percentage (39.3%) was obtained for teamwork across hospital units. At the same time, head nurses obtained the highest average percentage (28.2%) of positive perception among the three groups.

Table (3) represents the comparison between positive responses of nurses working in critical care units and nurses working in general wards regarding perception of patient safety culture. The table shows that there were statistically significant differences between response rate in items related to organizational learning and teamwork across the hospital units. ($X^2 = 3.75$ & 3.86 respectively at $p < 0.05$). Table (4) displays the comparison between positive responses of all staff nurses and head nurses regarding perception of patient safety culture. It is clear from the table that there were statistically significant differences between positive responses of staff nurses and head nurses in all dimensions of the survey except for the organizational learning dimension ($X^2 = 0.59$ at $p > 0.05$).

Hospital overall grade related to patient safety culture as perceived by nurses is presented in table (5). As shown in the table, almost third (33.7%) of staff nurses working in the critical care units and

slightly less than three fifths (59.5%) of staff nurses working in general wards grade their hospital as very good regarding patient safety. On the other hand, half of the head nurses (50%) categorized their hospital as acceptable.

Table (6) shows the number of events reported by the staff nurses over the last 12 months. It was clear that, the highest percentage of the total nurses (34.2%) reported no events related to patients' safety over the past 12 months. A minority (4.2%) reported 21 events or more over the last 12 months. Almost one fifth of the nurses (20.8%) reported

between 3-5 events related to patient's safety over the last 12 months.

Table (7) shows correlation between nurses' perception of patient safety culture and certain related variables. Results indicate a weak negative statistically significant correlation ($r = -0.210$) between staff nurses age and overall perception of patient safety culture, while there is no correlation between head nurses age and overall perception of patient safety culture ($r = 0.272$). At the same time, there is no correlation between staff nurses and head nurses years of experience and overall positive perception of patient safety culture.

Table (1): Characteristics of the study subjects and the likelihood of contact with patients

Items		Staff Nurses				Total Nurses		Head Nurses	
		Nurses Working in Critical Care Units		Nurses Working in General Wards					
		No	%	No	%	No	%	No	%
Age (in Years)	>20 -	71	85.5	4	10.8	75	63.2	3	10.8
	30-	10	12	15	40.5	25	20.2	15	53.6
	40-	2	2.5	17	45.9	19	15.8	5	17.8
	50-	0	0	1	2.8	1	0.8	5	17.8
							30.58±8.6		39.2±7.9
Qualification In nursing	Bachelor	35	42.2	10	27	45	37.5	20	71.5
	Technical institute	6	7.2	2	5.4	8	6.7	0	0
	Diploma	42	50.6	25	67.6	67	55.8	8	28.5
Years of experience in nursing									
	1-<10	23	27.7	5	13.5	28	23.3	3	10.7
	10-<20	46	55.4	2	5.4	48	40	20	71.5
	20-<30	9	10.8	7	18.9	16	13.4	5	17.8
	30-<40	5	6.1	23	62.2	28	23.3	0	0
						10.89±7.7		13.9±3.6	
Contact with patients	yes	83	100	30	81.1	113	94.6	20	71.5
	no	0	0	7	18.9	7	5.8	8	28.5

Table (2): Percentage distribution of nurses' positive and negative responses to hospital survey of patient safety culture

Dimensions	Nurses Working in Critical Care Units (*n= 83)				Nurses Working in General Wards (*n= 37)				Head Nurses (*n= 28)			
	Positive		Negative		Positive		Negative		Positive		Negative	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
1. Frequency of reported events	15	18.1	10	12.0	4	10.8	10	27.0	5	17.9	5	17.9
2. Overall perception of patient safety	23	27.7	10	12.0	11	29.7	7	13.5	10	35.7	6	21.4
3. Supervisor/manager expectation and actions promoting safety	24	28.9	5	6.0	9	24.3	5	13.5	9	32.1	3	10.7
4. Organizational learning	23	27.7	4	4.8	7	18.9	5	13.5	9	32.1	1	3.6
5. Teamwork within hospital units	22	26.5	12	14.5	11	29.7	7	18.9	9	32.1	3	10.7
6. Communication openness	16	19.3	11	13.3	8	21.6	9	24.3	5	17.9	5	17.9
7. Feedback and communication about error	16	19.3	10	12.0	5	13.5	9	24.3	5	17.9	6	21.4
8. Non-punitive response to error	14	16.9	12	14.5	11	29.7	7	13.5	9	32.1	2	7.1
9. Staffing	20	24.1	10	12.0	7	18.9	10	27.0	5	17.9	3	10.7
10. Hospital management support for patient safety	20	24.1	9	10.8	9	24.3	5	13.5	9	32.1	2	7.1
11. Teamwork across hospital units	16	19.3	12	14.5	11	29.7	5	13.5	11	39.3	2	7.1
12. Hospital handoffs and transitions	17	20.5	10	12.0	7	18.9	5	13.5	9	32.1	3	10.7
Average	22.7		11.5		22.5		18		28.2		12.1	

*N.B: The scale was a 5- point likert scale. Neutral responses were not calculated

Table (3): Comparison between positive responses of nurses working in critical care units and nurses working in general wards regarding perception of patient safety culture.

Dimensions	Nurses working in critical care units (n=83)		Nurses working in general wards (n= 37)		X ²	Significance
	NO	%	No	%		
1. Frequency of reported events	15	18.1	4	10.8	1.01	>0.05
2. overall perception of safety	23	27.7	11	29.7	2.09	>0.05
3. Supervisor /manager expectation and actions promoting safety	24	28.9	9	24.3	0.27	>0.05
4. Organizational learning	23	27.7	7	18.9	3.75	<0.05*
5. Teamwork within hospital units	22	26.5	11	29.7	0.13	>0.05
6. Communication openness	16	19.3	8	21.6	0.08	>0.05
7. Feedback and communication about error	16	19.3	5	13.5	0.59	>0.05
8. Non-punitive response to error	14	16.9	11	29.7	2.57	>0.05
9. Staffing	20	24.1	9	24.3	0.08	>0.05
10. Hospital management support for patient safety	20	24.1	9	24.3	0.001	>0.05
11. Teamwork across hospital units	16	19.3	11	29.7	3.86	<0.05*
12. Hospital handoffs and transitions	17	20.5	7	18.9	0.02	>0.05

(*) Statistically significant at p<0.05

Table (4): Comparison between positive responses of total staff nurses and head nurses regarding perception of patient safety culture.

Dimensions	Total Staff Nurses (n=120)		Head Nurses (n=28)		X ²	p-value
	NO	%	No	%		
1.Frequency of reported events	19	15.8	5	17.9	4.29	<0.05*
2.Perception of patient safety	25	20.8	10	35.7	3.78	<0.05*
3.Supervisor /manager expectation and actions promoting safety	33	27.5	9	32.1	3.85	<0.05*
4.Organizational learning	30	25	9	32.1	0.59	>0.05
5.Teamwork within hospital units	33	27.5	9	32.1	3.85	<0.05*
6.Communication openness	24	20	5	17.9	5.42	<0.05*
7.Feedback and communication about error	21	17.5	5	17.9	5.71	<0.05*
8.Non-punitive response to error	25	20.8	9	32.1	4.72	<0.05*
9.Staffing	30	25	5	17.9	4.76	<0.05*
10.Hospital management support for patient safety	29	24.2	9	32.1	3.93	<0.05*
11.Teamwork across hospital units	27	22.5	11	39.3	4.02	<0.05*
12.Hospital handoffs and transitions	24	20	9	32.1	7.62	<0.05*

(*) Statistically significant at p<0.05

Table (5): Work area/unit overall grade on patients' safety as perceived by nurses.

Patients safety Grade	Nurses Working in Critical Care Units (no =83)		Nurses Working in General Wards (no= 37)		Total Staff Nurses (no= 120)		Head Nurses (no=28)	
	No	%	No	%	No	%	No	%
Excellent	19	22.9	1	2.7	21	17.5	4	14.3
Very good	28	33.7	22	59.5	50	41.7	5	17.8
Acceptable	22	26.5	9	24.3	31	25.8	14	50.0
Poor	12	14.5	5	13.5	17	14.1	4	14.3
Failing	2	2.4	0	0	1	0.9	1	3.6

Table (6): Number of events regarding patients' safety reported by staff nurses

Number of events reported over Last 12 months	Nurses Working in Critical Care Units (n= 83)		Nurses Working in General Wards (n= 37)		Total Staff Nurses (n= 120)	
	No	%	No	%	No	%
No events reported	27	32.5	14	37.8	41	34.2
2	10	12	10	27.0	20	16.7
3 - 5	16	19.3	9	24.3	25	20.8
6 – 10	17	20.5	3	8.1	20	16.7
11 – 20	9	10.8	0	0.0	9	7.5
21 or more	4	4.82	1	2.7	5	4.2

Table (7): Correlation between nurse's perception of patient safety culture and certain related variables

Items	Staff Nurses	Head Nurses
Age	r = - 0.210* P=0.021 P<0.05 S	r =0.272 P=0.161 P>0.05 NS
Years of experience	R= -0.027 P=0.891 P>0.05 NS	R=- 0.066 P=0.473 P>0.05 NS

* Significant

NS= Not significant

4. Discussion:

The aim of the present study was to assess nurses' perception of patient's safety culture at Medical and Paediatric University Hospitals and developing an improvement plan to enhance patient safety at the study settings.

The present study findings showed an overall staff and head nurses positive response to patient safety culture. This result is congruent with Singer et al. (2003) and Bscphm et al. (2008), in similar studies who found that, the overall percentage of positive response to patient safety culture was higher than negative. On the other hand this study findings were contradicting with a study conducted in Egypt by Abbas , et al. (2, et al. (2007) identified poorer perception of safety culture by nurses.

The current study results revealed that there was a significant difference between perception of nurses working in critical care units and nurse working in general wards in relation to the organizational learning environment dimension, where nurses working in critical care units perceive

this dimension more positively than nurses working in the general wards, which answers the first research question. The reason behind this could be simply explained as training and ongoing educations are usually directed to critical care unit nurses more than other unit's nurses. Similarly, a study done by Ahmed (2002) reported that, most of the training required by nurses was in the area of critical care unit.

This study finding revealed that, staff nurses perceived patient safety culture more positively than negatively. This result is comparable to previous study findings, which revealed that the overall percentage of positive responses of patient safety culture was higher than negative responses among staff nurses (Singer et al., 2003). At the same time, head nurses perceive patient safety culture more positively than staff nurses do. This result is in accordance with several previous studies (Singer et al., 2003; Kim et al., 2007; and Singer et al., 2008), which reported that, head nurses usually perceive safety culture more positively than staff nurses do. Possible reasons for this phenomenon could be explained as: first, managers have less opportunity to witness the safety

hazards, which is commonly existed in frontline situations; and second managers fail to communicate the organizational safety initiatives, policies, and expectations to the frontline staff. Another possible explanation would be the lack of a reporting culture or the mechanism to encourage reporting. Additionally, nursing managers consciously establish and reinforce the norms and attitudes related to safety practices, which could engender a positive perception of patient safety culture (Alton et al., 2006; Voqus and Sutcliffe 2007; Singer et al., 2008).

The highest percentage of staff nurses working in critical care units perceived supervisor/manager expectations and actions promoting safety culture dimension more positively than those working in general wards did. These results may be attributed to that, the critical care units' work which needs more supervision and compliance to safety standards because of the critical condition of patients. As well, this finding could be due to that, the environment of a critical area necessitates the supervision to be stronger and harder than in the general units. This finding is supported by Ahmed (2002), who concluded that, nurses working in critical areas or units always work under stress and busy tone.

The current study finding revealed a significant difference between nurses working in general wards and nurses working in critical care units as the first group respond more positively to the dimensions related to teamwork across hospital units than the last one. This finding might be explained by that, the working environment in the general wards is quiet and allows more time to communicate than in the critical ones. In this respect, Guise and Sigel (2008) emphasized that good team work is essential for the delivery of effective and efficient care in any clinical setting.

Results regarding teamwork also received the highest positive responses by head nurses suggesting that these are the areas of strength. High percentage in nurses' perception of team might reflect the evidence of effective team collaboration in the study organization. This finding could be due to that university hospital environment is providing a model of collaboration and teamwork. It could also have been the result of hospital management that is valuing nurses' teamwork. The highest positive response rate of communication and teamwork within units is congruent with what was reported by Espin et al., (2006;and AHRQ (2008).

As regards the communication openness dimension, staff nurses working in the critical care units are responding to it more positively than those working in the general wards. This result could be explained as nurses in critical care units recognize the importance of effective communication among healthcare team. This results is congruent with (Cuthbertson, et al. 2007 and Baker et al., 2009) who

concluded that effective team communication and coordination are recognized as being crucial for improving quality and safety in acute medical setting such as in ICU. Additionally, the Joint Commission of Accreditation (JCAHO) (2009), emphasised the importance of effective communication among caregivers.

The second research question was confirmed by that, there are significant differences between staff nurses' and head nurses' perception of patient safety culture. The highest percentage of head nurses had positive responses toward most of the dimensions. The reason behind that may be due to that head nurses were satisfied with their units and had a feeling that they apply more control, since they might have higher expectations for the patient safety on their units. This could be also due to that head nurses are frontline nurses in the organization and they usually recognize the importance of patient safety.

The lowest positive response to the non-punitive response to error dimension was shown by nurses working in critical care units. This result might be due to the close supervision in the critical care units, where mistakes are apparent. This finding is consistent with the AHRQ (2008) report, which showed that the cultural dimension of non-punitive response to error received the highest negative response percent (Boyle, 2004; and Kim et al., 2007). Conversely, the highest percentage of nurses working in general wards as well as head nurses responded positively toward this dimension. This result might be due to less supervision in the general wards, meanwhile head nurses may have thought that they were applying non-punitive culture in the hospital or they might not be punished by their supervisors.

The lowest percentage of positive response as identified by nurses working in general wards was related to frequency of reported events. This might be due to the low level of supervision and controlling system, and the presence of the punitive culture in the hospital. Therefore, nurses were afraid to report errors and probably afraid from being punished for making errors.

Regarding to the number of events reported by staff nurses, the current study results revealed that, little percentage of nurses reported events over the past 12 months. It is likely that this percentage represents under-reporting of safety events. In a similar study, the AHRQ (2008) stated that, an average of 48 % respondents reported the safety events in their hospitals over the past 12 months. Two possible reasons might contribute to this low reported safety events: First, it might be due to the presence of blaming or punishment culture. So, nurses choose not to report in order to avoid being punished by management and being jeered by peers (Kalisch & Aeberdold, 2006). Reporting error in a study carried out by Throckmorton and Etchegaray (2007) revealed that nurses identified the reason for not reporting error, if it is serious or if it affects the patients.

The second reason that might have contributed to low reported safety events in this study might be due to that nurses were afraid to report errors because they don't trust their management and perceived trustworthiness of managers and organizations were found to be related to patient safety culture. Congruent with the current study finding, a study conducted by Burns et al. (2006) revealed that, the major reason for nurses unwillingness to report errors were concerns about losing trust of their managers and peers. The finding is also consistent with another study, where researchers found that high manager trustworthiness facilitates open safety communication (Conchie et al., 2006).

There were differences between staff nurses and head nurses regarding to hospital overall grade on patients safety. Slightly less than three fifth of nurses working in general wards graded their hospital as very good, while only third of nurses working in critical care unit gave the same score. On the other hand, half of the head nurses graded their hospital as acceptable. these findings are in agreement with Richardson and Williams (2007), who concluded that, the head nurses usually are more experienced and they are more likely to find safety hazards in their work situations. It is also possible that the head nurses feel more comfortable in reflecting their true perceptions because they may feel more protected in their positions.

The correlation of staff nurses' age and their perception of patient safety culture showed significant weak negative correlation, this finding is extremely important because it reflects the reality of nurses concern regarding risks. This means that regardless of their reporting of positive responses their feeling of unsafe culture grows overtime.

5. Conclusion:

Almost one third of the nurses under study perceived the patient safety culture positively. There were statistically significant differences between nurses working in critical care units and nurses working in general wards regarding to patient safety culture in two dimensions. Head nurses perceived the patient safety culture more positively than staff nurses in seven dimensions. The majority of the nurses under study did not report the safety events in their work areas. There are areas of strengths and weaknesses in nurse's perception that can be improved to provide best safe culture for patient care. Non-punitive environment scored high negative response.

Recommendations:

1. Nurses are in need to be encouraged to improve reporting of events or incidents related to patients' safety.

2. Further studies are needed for testing the reliability of the improvement plan and accordingly implementing it at the study settings.
3. Developing and disseminating procedures for patient safety among all nursing staff working in critical care and general wards to assure the compliance with all appropriate standards.
4. Staff development programs should be conducted for head nurses at all levels to be aware of the significance of patient safety culture in their work areas and organizations.
5. Staff development programs are needed for all nurses working in critical care units and general wards to understand the values, beliefs, and norms about what is important in an organization and what attitudes and behaviours related to patient safety are expected and appropriate for achieving a culture of safety.
6. Head nurses are in need to be encouraged to establish non-punitive environment as well as a teamwork spirit among nursing staff working in critical care and general ward staff nurses.
7. Supporting more research efforts particularly in areas that yield the greatest benefit and that more effectively contribute to improving patients' safety and safe patients' lives.

Implication of the study

The results have implications for nursing practice; and administration, as the study considers organizational and individual factors that might influence patient safety. The outcome of this study would also be useful in supporting a culture of patient safety and quality improvement in health care service to be accredited. Additionally, it could help nurse managers to create a culture of safety and prevention of accidental harm through identification of safety dimensions , prospective analysis and follow the improvement plan.

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