



Safety Culture in Neonatal Intensive Care Units in the Gaza Strip, Palestine: A Need for Policy Change



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ABSTRACT

Introduction: Assessment of the prevailing safety culture within the Gazan health care system can be used to identify problem areas. Specifically, the need for improvements, raising awareness about patient safety, the identification and evaluation of existing safety programs and interventions for improving the safety culture. This study aims to assess the safety culture in the neonatal intensive care units (NICUs) in Gaza Strip hospitals and to assess the safety culture in regards to caregivers' characteristics.

Methods: In a cross-sectional study using a census sample, we surveyed all nurses and physicians working in at all the NICUs in the Gaza Strip, Palestine. The Safety Attitudes Questionnaire (SAQ) which includes six scales was used to assess participants' attitudes towards safety culture.

Results: The overall score for SAQ was 63.9. Domains' scores ranged between 55.5 (perception of management) and 71.8 (stress recognition). The scores reported by our participants fell below the 75 out of a possible score of 100, which was considered as a cut-off point for a positive score. Moreover, our results revealed substantial variation in safety culture domain scores among participating NICUs.

Conclusion: These results should be an indicator to our health care policy makers to modify current or adopt new health care policies to improve safety culture. It should also be a call to design customized programs for improving the safety culture in NICUs in the Gaza Strip.

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Introduction

In spite of modern medical technology, continuing research, and advanced training facilities, safety issues are still one of the major problems in many health care systems (Haerkens, Jenkins, & van der Hoeven, 2012). Several international reports and studies (Baker et al., 2004; Haerkens et al., 2012; Kohn, Corrigan, & Donaldson, 2000; Levinson & General, 2010; Rothschild et al., 2005; Vincent, Neale, & Woloshynowych, 2001) showed that a high percentage of patients admitted to hospitals suffered from unintentional harm or adverse events that could be prevented in most cases. These adverse events do not only affect patients, but they also lead to an increased number of hospitalization days and increased hospital costs (Haerkens et al., 2012; Hoonhout et al., 2009; Miller, Elixhauser, & Zhan, 2003).

As a result, awareness about patient safety and the importance of safety culture has been gaining greater attention (Kohn et al., 2000; van der Starre, 2011). More efforts have been made to improve safety

measures (Haerkens et al., 2012) and more strict procedural guidelines, checklists, and safety programs have been implemented by several health care systems to provide safer care to patients (de Vries et al., 2010). Therefore, adopting an improved safety culture within hospital departments is now considered as one of the main features contributing to a better quality of care (Sexton et al., 2011).

Safety culture was defined by the Health and Safety Commission as "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" (Health and Safety Commission, 1993, p. 23). A strong safety culture in health care organizations contributes to the promotion of an environment that enables the provision of safe care (Hamdan, 2013) and therefore, reduces the number of errors. It is important to recognize that the potential for errors always exists and that teamwork and communication are the basis to guarantee change towards safer care (American Academy of Pediatrics, 2001). Assessment of prevailing safety culture within the health care system can be used to identify areas that need improvements, to raise awareness about patient safety, and to identify and evaluate safety programs and interventions to improve safety culture (Nieva & Sorra, 2003; Peter Pronovost et al., 2005) and reduce the number of errors.

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In Neonatal Intensive Care Units (NICU's), newborns are a vulnerable group (Snijders, van Lingen, Molendijk, & Fetter, 2007). The severity of their illness, multiple treatment interventions, and the high technology environment that require continuous monitoring make them more vulnerable and at a higher risk for potential errors compared to other groups of patients admitted to different departments in the hospital (Cauduro, Sarquis, Sarquis, & Drehmer, 2015). Evidence from literature shows that neonates admitted to NICUs are at a significantly higher risk for medication errors and adverse events compared to other patients (Kaushal et al., 2001). Moreover, medical errors have a greater impact on these vulnerable patients (Haerkens et al., 2012). The evidence about NICUs in the Palestine is still inadequate to inform safety programs. The issue of safety culture in Palestinian NICUs was investigated by Hamdan (2013) in the West Bank hospitals. Hamdan's study showed that SAQ mean domains scores ranged from 71.22 for job satisfaction to 37.02 for stress recognition on a 100-point scale and the scores varied significantly among NICUs in the West Bank ($P < 0.05$). This study complements an earlier work and aims to assess the safety culture in NICU's in Gaza Strip hospitals. It also assesses the associations between safety culture and caregivers' characteristics. In addition; this study was designed to answer the following two questions: (a) what is the level of safety culture at NICU's in Gaza Strip? And (b) is there a relationship between reported safety culture and caregivers' characteristics?

Methods

Study Design

The study used a cross-sectional design. Data were collected between March and April 2015.

Setting and Sample

The study was conducted in all of the six NICUs in the Gaza Strip. These are located exclusively in government run hospitals. During the study period, the number of NICU beds ranged between 7 and 36. Regardless of the variation of the number of beds, these NICU's provide similar care and there are no differences in acuity of cases admitted to them.

The target population for the study consisted of all the nurses and physicians working in these NICUs. The eligibility criteria involved having a work experience of at least three months in the NICU at the time of the data collection. A census survey was conducted due to the small size of the study population. A total of 185 surveys were distributed by hand to all the physicians (49) and nurses (136) working in the six NICUs in the Gaza Strip.

Survey Instrument

The Safety Attitudes Questionnaire (SAQ) ICU short form (Sexton, Helmreich et al., 2006) was used to assess health care providers' attitudes towards their safety cultures in the NICUs. The instrument used consisted of 33 items grouped in six domains: teamwork climate, safety climate, job satisfaction, perceptions of management, working conditions, and stress recognition. Each item was answered using a 5-points Likert scale (1 = disagree strongly, 2 = disagree slightly, 3 = neutral, 4 = agree slightly, 5 = agree strongly). These scores were later converted to a 100-points scale during analysis to facilitate interpretation of the results (1 = 0, 2 = 25, 3 = 50, 4 = 75 and 5 = 100). Each domain score equals the mean score of its component survey items. A positive score is defined as 75 or more on 100-points scale (Huang et al., 2010). An Arabic version of the tool that was previously used by Hamdan (2013) in the West Bank was also used in this study. The survey included two additional questions to participants: "how do you rate patient safety level at your department (excellent, very good, acceptable, weak, failure)" and "what was the number of events reported

in the past 12 months?." These two questions were added to have a proxy measure of the overall safety level at the NICUs as perceived by healthcare providers and to assess their incident reporting behavior since an earlier study in the West Bank (Hamdan, 2013) showed that there was a serious weakness in incident reporting at Palestinian hospitals.

The SAQ demonstrated good psychometric properties to help assess safety culture in health care (Sexton, Helmreich et al., 2006; Sexton, Holzmueller et al., 2006; Sexton, Holzmueller et al., 2006; Colla, Bracken, Kinney, & Weeks, 2005). The original SAQ instrument was translated into the Arabic language in a previous study (Hamdan, 2013). This was to remove any language barriers. Reliabilities of the Arabic version of the SAQ were assessed using Cronbach α , which ranged from 0.59 (for teamwork climate) and 0.75 (for job satisfaction) (Hamdan, 2013). In spite of the lower Cronbach α with the original instrument, the Cronbach α values for this study ranged between 0.61 and 0.84 which fall within the acceptable range (George & Mallery, 2003).

Data Collection

The survey was distributed to all nurses and physicians who met the inclusion criteria for all targeted NICUs. Questionnaires were handed by a member of the research team to all potential participants. Responses were returned by sealed envelopes to ensure the anonymity and confidentiality of all participants and to minimize bias. Each participant was provided with an informed consent regarding the voluntary nature of participation and the confidentiality of the information gathered. Ethical approval was obtained from the Helsinki Committee (a research ethics committee) in the Gaza Strip. Besides that, the Ministry of Health provided a permission to conduct the study at governmental hospitals.

Data Analysis

Data were entered and analyzed using SPSS version 18 (SPSS, 2009). The scores of the two negatively worded survey items were reversed. Response scores were converted from a 5-Likert scale to a 100-point scale using the SAQ computation instructions (Sexton, Helmreich et al., 2006; Sexton, Holzmueller et al., 2006; Sexton, Holzmueller et al., 2006). A composite scale score was calculated by summing the scores of the items with the scale. Then mean average for the scale was calculated by dividing the composite score by the number of items. Finally, the percentages of positive responses for the survey scales and items were calculated. Positive responses in positively worded survey items were 'agree/strongly agree' and in negatively worded items were 'disagree/strongly disagree'.

Descriptive statistics including percentages, means and standard deviations were used for all survey items and domains. ANOVA and paired sample *t*-tests were used to compare means. In the univariate analysis, analysis of variance was used to test associations between composite patient safety scores and the different characteristics of respondents. These analyses used a 95% confidence interval and a significance level of 0.05.

Results

A total of 163 questionnaires were returned with a response rate of 88.1%. Three of them were excluded because they contained several missing data. Table 1 summarizes the characteristics of the participants. The majority of participants were nurses (84.5%), males (54.2%), 30 years or younger (62.8%), and with a bachelor's degree or higher level of education (69.9%).

Table 2 shows the respondents' ratings of the SAQ items and scales as well as the percentages of positive responses for each item. The 'Stress recognition' domain received the highest score (71.8) followed by job 'satisfaction domain' with a mean score of 66.7. The 'safety climate domain' came third with a mean score of 61.9 followed by the

Table 1
Characteristics of the respondents.

Variable	F	%
Sex (n = 155)		
Male	84	54.2
Female	71	45.8
Age (n = 156)		
≤30 years	98	62.8
>30 years	58	37.2
Education level (n = 156)		
Diploma (2 years)	47	30.1
Bachelor's degree	85	54.5
Graduate studies	24	15.4
Job titles (n = 155)		
Physicians	24	15.5
Nurses	131	84.5
Years in profession (n = 153)		
≤5 years	62	40.5
>5 years	91	59.5
Years in hospital (n = 148)		
≤5 years	96	64.9
>5 years	52	35.1
Work hours per week (n = 155)		
<40 h	97	62.6
≥40 h	58	37.4
Work shifts (n = 156)		
Morning	29	18.6
Evening	6	3.8
Night	9	5.8
Mixed shifts	112	71.8

F: Frequency; %: Percentage.

'teamwork climate' domain with a mean score of 59.8. The 'working conditions' domain had a mean score of 56.8. Finally, the domain 'perception of management' came in last with a mean score of 55.4. When the scores reported by nurses were compared with those reported by physicians, the findings showed that there were no statistically significant differences in any of the SAQ domain scores between physicians and nurses.

Fig. 1 illustrates the variations among the participating NICUs in all of the SAQ domain scores ($P < 0.05$). The results show that except for the stress recognition domain, significant variations do exist among Gaza Strip NICUs ($P < 0.05$). Such results reflect the opportunities for tailoring a customized patient safety improvement program for each of these units.

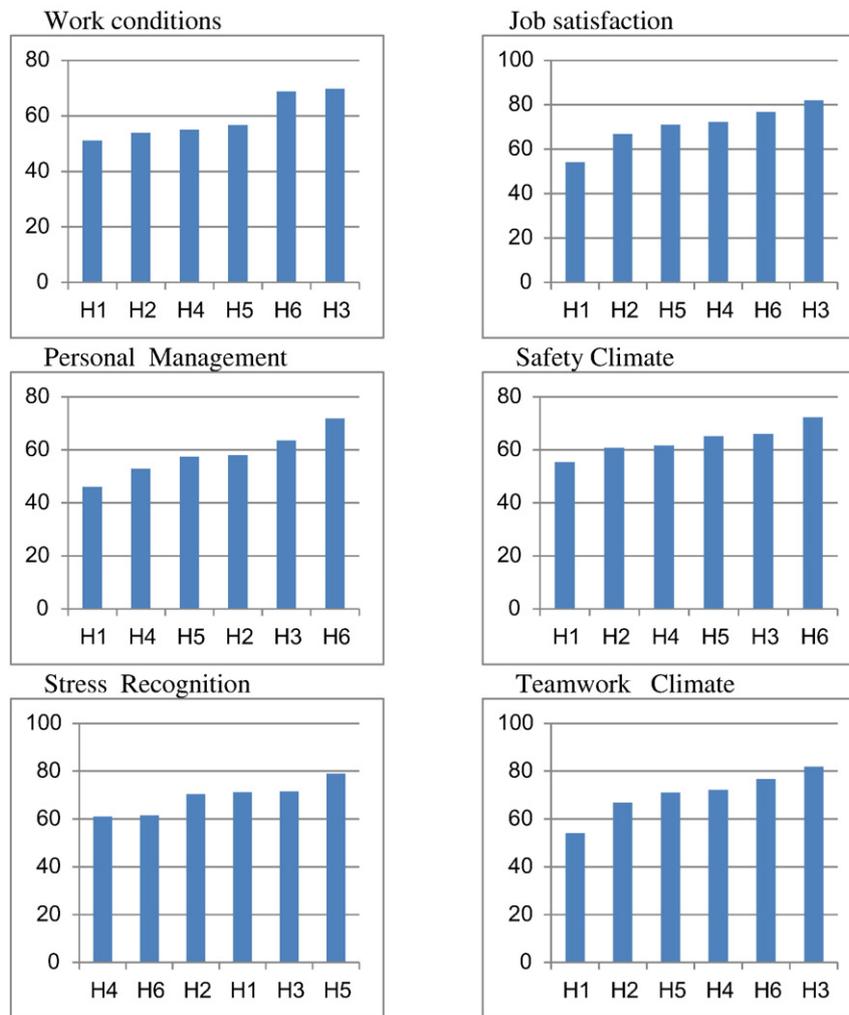
Table 3 presents the mean composite SAQ scores reported by the respondents according to the characteristics of the participants and the studied NICUs. Statistically significant differences were found in the overall SAQ scores in relation to the number of working hours per week and the number of beds at the NICU ($P < 0.05$). Those who worked <40 h a week had a mean of 64.40 compared with a mean of 57.94 for those who worked 40 h or more per week ($P = 0.002$). Participants who worked in smaller NICUs (with 15 beds or less) had a mean of 65.10 compared to 59.69 for those working in larger NICUs ($P = 0.007$).

Participants were also asked to indicate the number of events they reported in the past 12 months (Table 4). They were then asked to assign a grade for the patient safety level at their NICUs. The results showed low levels of event reporting in the NICUs, whereas 58.9% of the participants had not reported any event in the past 12 months. Physicians reported events more frequently than nurses, where 79.8% of the

Table 2
SAQ items, scales' mean scores, and percentages of positive responses.

	Mean	SD	% positive response
Job Satisfaction (Cronbach $\alpha = 0.74$)	67.6	18.1	63.1
I like my job	77.9	22.5	79.5
Working in this hospital is like being part of a large family	74.7	25.6	73.8
This hospital is a good place to work	62.3	27.0	55.0
I am proud to work at this hospital	74.2	26.7	75.7
Morale in this NICU is high	45.3	28.9	31.7
Safety climate (Cronbach $\alpha = 0.61$)	61.8	16.2	55.5
I would feel safe being treated here as a patient	70.0	24.4	71.9
Medical errors are handled appropriately at this NICU	67.3	21.6	67.9
I receive appropriate feedback about my performance	57.4	27.9	47.8
In this NICU, it is difficult to discuss errors ^a	49.8	25.5	32.7
I am encouraged by my colleagues to report any patient safety concerns I may have	60.2	25.0	56.6
The culture in this NICU makes it easy to learn from the errors of others	65.7	27.1	59.1
I know the proper channels to direct questions regarding patient safety in this NICU	61.9	26.8	52.2
Teamwork climate (Cronbach $\alpha = 0.62$)	64.0	16.8	55.9
Personnel input about patient care is well received in this NICU	65.9	27.8	64.8
In this NICU, it is difficult to speak up if I perceive a problem with patient care ^a	44.5	27.0	27.2
Disagreements in this NICU are appropriately resolved (i.e., not who is right, but what is best for the patient)	60.8	28.1	58.8
I have the support I need from other personnel to care for patients	57.8	25.8	48.0
It is easy for personnel in this NICU to ask questions when there is something that they do not understand	68.3	22.4	67.5
The physicians and nurses here work together as a well-coordinated team	71.2	28.2	68.9
Working conditions (Cronbach $\alpha = 0.80$)	57.8	22.2	49.8
This hospital does a good job of training new personnel	58.8	30.7	52.2
All the necessary information for diagnostic and therapeutic decisions is routinely available to me	58.1	26.2	50.0
This hospital deals constructively with problem personnel	54.5	27.5	46.9
Trainees in my discipline are adequately supervised	56.5	29.8	50.1
Perception of management (Cronbach $\alpha = 0.69$)	55.5	20.8	47.6
Hospital administration supports my daily efforts	55.0	30.0	48.2
Hospital management does not knowingly compromise the safety of patients	73.6	27.2	71.0
The levels of staffing in this NICU are sufficient to handle the number of patients	34.8	29.3	19.4
I am provided with adequate, timely information about events in this hospital that might affect my work	58.5	29.1	51.6
Stress recognition (Cronbach $\alpha = 0.84$)	71.8	24.0	69.0
When my workload becomes excessive, my performance is impaired	73.5	30.6	71.1
I am less effective at work when fatigued	77.3	27.9	77.2
I am more likely to make errors in hostile or tense situations	66.9	29.7	60.9
Fatigue impairs my performance during emergency situations	69.3	29.0	66.6
Overall SAQ (Cronbach $\alpha = 0.86$)	63.9	12.6	

^a Scores were reversed.



X axis: NICUs; Y axis: Subscale score on 100-point scale.

Scale F: P-value

Job satisfaction	11.1: $P < .001$
Safety climate	4.9: $P < .001$
Teamwork climate	4.0: $P = .002$
Working conditions	2.6: $P > .029$
Perception of management	4.8: $P > .001$
Stress recognition	6.7: $P > .176$

Fig. 1. Safety Attitudes Questionnaire mean scale scores by NICUs.

physicians reported at least one event in the past 12 months in comparison with only 34.1% of the nurses ($X^2 = 23.7, P < 0.0001$).

In general, the respondents have very positive perceptions of the safety level in the NICUs in the Gaza Strip as 78.8% of them rated the safety of their units as either excellent or very good. Nurses are more positive in their attitudes towards patient safety in their units than physicians. However, this is not statistically significant ($X^2 = 0.996, P = 0.809$).

Discussion

This study has focused attention on the safety culture in the NICUs in Gaza hospitals. The SAQ scores reported by our participants fell below the 75 out of a possible score of 100, which was considered by Huang et al. (2010) as the cut-off point for a positive score. However, the results revealed that three domain scores were in line with the benchmarking scores reported by Sexton, Helmreich et al. (2006), Sexton, Holzmueller et al. (2006) and Sexton, Holzmueller et al. (2006). The scores for the domains of ‘safety climate’, ‘teamwork climate’ and ‘working conditions’ were less than those reported by

Sexton, Helmreich et al. (2006), Sexton, Holzmueller et al. (2006) and Sexton, Holzmueller et al. (2006). In comparing our results to the benchmarking scores, we need to consider that the benchmarking data were collected in the adult ICUs located in the USA. These ICUs may differ from NICUs in the Gaza Strip in attributes such as nurse to physician ratio and nurse to patient ratio. However, our results were close to the results reported by Profit et al. (2012) in a study conducted in the USA (domain mean scores ranged between 56.3 and 77.8) and the results reported in a Dutch study conducted by Poley, van der Starre, van den Bos, van Dijk, and Tibboel (2011) (domain mean scores ranged between 54.7 and 70.9).

This study replicates a previous one conducted by Hamdan (2013) in the West Bank (the northern part of Palestine). The scores for all the domains in our study were less than those reported in Hamdan’s study, with the exception of the score for ‘stress recognition’ domain (Table 5). Such results may need further investigation to help identify why health care providers in the Gaza Strip have a higher level of stress recognition than their counterparts in the West Bank.

As seen in Table 2, the score for the item, ‘The levels of staffing in this NICU are sufficient to handle the number of patients’ was 34.8. Yet, only

Table 3
Association between participant characteristics and overall SAQ scores.

Variable	Mean SAQ score	SD	P
Sex (n = 155)			0.867
Male	62.15	13.2	
Female	61.80	12.0	
Age (n = 156)			0.150
≤30 years	60.89	13.0	
>30 years	63.93	12.0	
Education level (n = 156)			0.090
Diploma (2 years)	65.46		
Bachelor's degree	60.75		
Graduate studies	60.21		
Job titles (n = 155)			0.868
Physicians	61.78	12.2	
Nurses	26.25	12.8	
Years in profession (n = 153)			0.302
≤5 years	60.54	12.6	
>5 years	62.71	12.7	
Years in hospital (n = 148)			0.158
≤5 years	60.56	12.9	
>5 years	63.62	12.8	
Work hours per week (n = 155)			0.002
≤39 h	64.40	12.0	
≥40 h	57.94	12.9	
Work shifts (n = 156)			0.964
Morning	62.79		
Evening	60.17		
Night	62.77		
Mixed shifts	61.58		
Number of NICU beds (n = 160)			0.007
≤15 beds	65.10	1.4	
>15 beds	59.69	1.3	

19.4% of respondents gave a positive response to this item. Such shortage of staff may affect the safety of provided care and may lead to an increase in the number of errors in Gaza NICUs.

Other significant findings from our research that call attention are the participants' responses for the items: 'In this NICU, it is difficult to discuss errors' and 'In this NICU, it is difficult to speak up if I perceive a problem with patient care.' The scores for these two items were 49.8 and 44.5 respectively, while the percentages of positive answers for the same items were 32.7 and 27.2. This could be due to the environmental and organizational culture that exists in the NICUs where there is much emphasis on technical skills but not on teamwork, leadership, and communication (Brindley, 2010). Furthermore, Haerkens et al. (2012) argued that the typical culture in the ICU doesn't allow junior staff to question the decisions made by senior staff which adds to the challenge.

In spite of the high score for stress recognition (71.8), low score for perception of management (55.5), and low score for working condition (57.8), our participants reported a job satisfaction score (67.6) higher than the benchmarking score (64.3). Such findings are inconsistent with literature. For example, according to Sexton, Helmreich et al. (2006), poor teamwork may be a significant source of nurses' job dissatisfaction that has led to a critical nursing shortage. Furthermore, several studies reported that stress and high workload decrease performance of nurses and doctors and increase number of medical errors (Barger et al.,

Table 4
Number of events reported by participants in the last 12 months.

Variable	All participants		Physicians (n = 24)		Nurses (n = 129)	
	F	%	F	%	F	%
No event reported	93	58.9	5	20.8	85	65.9
1–2 events	40	25.3	9	37.5	30	23.3
3 or more events	25	15.8	10	41.7	14	10.9

F: frequency; %: Percentage.

Table 5
Comparison between the results of this study and Hamdan (2013).

Domain	Gaza NICUs		West Bank (Hamdan, 2013)	
	Mean	SD	Mean	SD
Job Satisfaction	67.6	18.1	71.9	18.3
Safety climate	61.8	16.2	66.4	15.2
Teamwork climate	64.0	16.8	66.0	15.2
Working conditions	57.8	22.2	63.4	21.2
Perception of management	55.5	20.8	63.2	18.8
Stress recognition	71.8	24.0	63.0	22.2

2006; Landrigan et al., 2004; Lockley et al., 2007; Scott, Rogers, Hwang, & Zhang, 2006).

The domain that received the highest score by our participants was the 'stress recognition' domain. This could be related to the nature of work in NICUs, as nurses and doctors provide specialized care to patients who are critically ill and have unstable vital functions along with a high mortality rate (Cavalheiro, Moura Junior, & Lopes, 2008). Working in such a stressful environment can impact the mental health of nurses and physicians and consequently affect their work performance (Kawano, 2008). Moreover, other literature reveals that over-stress, higher workload and difficult working conditions are closely associated with adverse events in NICUs (Cavalheiro et al., 2008; Kawano, 2008; Poley et al., 2011; Weissman et al., 2007).

Although the score of 'perception of management' domain in our study was above the benchmark, it was still fairly low. According to Firth-Cozens (2004) and Frankel et al. (2008), open communication, support of team work, rewards for reporting, allocation of appropriate resources and senior executive walk rounds to demonstrate senior leadership commitment to patient safety are all means to improve 'perception of management' and thereby the safety culture.

While our results showed that there were no statistically significant differences between nurses and doctors' attitudes towards all domains of safety culture, other studies found that nurses had lower scores in most domains of SAQ than doctors (France et al., 2010; Huang et al., 2007). This was especially true in the 'team work climate' domain (France et al., 2010; Grant, Donaldson, & Larsen, 2006; Huang et al., 2007; Poley et al., 2011; Sexton, Holzmüller et al., 2006; Sexton, Makary et al., 2006). The results in another study revealed that physicians' perceptions about patient safety were higher than nurses' perception (Abbasi, Farahani-Nia, & Mehrdad, 2014). However, in the Pronovost et al. (2003) study, physicians reported lower scores than nurses in most domains of the SAQ. This shows an agreement among both nurses and physicians on patient safety needs in NICUs in Gaza.

Our results, in line with earlier results in the West Bank (Hamdan, 2013), showed that those working less hours are more positive towards patient safety in their units than those doing overtime working in Gaza NICUs. Research has shown that long working hours and overtime working are associated with perceived quality of care and patient safety (Rogers, Hwang, Scott, Aiken, & Dinges, 2004; Griffiths et al., 2014). Long working hours are known to be associated with fatigue and lower clinical performance (Ehara, 2008; Wagstaff & Lie, 2011).

Also, consistent with Hamdan's (2013) study, workers in smaller NICUs in Gaza (≤10 beds) were more positive towards safety climate in their units. It worths to indicate that the NICUs with the biggest number of beds have the largest number of nurses and physicians and they serve all the severe cases in Gaza Strip. Since personnel of small NICUs knows each other better that might help to overcome difficult working conditions and consequently would impact positively on patient safety (Raftopoulos & Pavlakis, 2013).

Our results showed significant variations in all domains of SAQ scores among different NICUs (Fig. 1). This is consistent with the results of several other studies (Hamdan, 2013; Profit et al., 2012; Sexton, Helmreich et al., 2006; Sexton, Holzmüller et al., 2006; Sexton, Holzmüller et al., 2006; Singer et al., 2003; Singer et al., 2009). Such

results may suggest an effective and efficient safety culture implementation of customized intervention programs to meet the needs for each individualized NICU (Hamdan, 2013). Evidence showed that comprehensive unit-based safety programs that provided a framework for addressing patient safety culture issues at local level can improve work force perceptions and therefore improve safety culture (Pettker et al., 2011; Timmel et al., 2010). In a study conducted by Haerkens et al. (2012), overall mean 'safety climate' scores improved significantly from 42.5% to 52.2% after implementing a safety program in an ICU. Such results should serve as a motive for hospital administrations to prioritize and implement safety intervention programs (Hamdan, 2013).

The score for the 'team work climate' domain in our study was relatively low (64) when compared to the benchmark score (70.7) as reported by Sexton, Helmreich et al. (2006), Sexton, Holzmueller et al. (2006), and Sexton, Holzmueller et al. (2006). However, it was close to the score reported in another study conducted by Hamdan (2013). Evidence from other studies show that there is a strong relationship between team work and patient safety in critical care and this has been mainly attributed to better communication, coordination and collaboration among team members within the same department (Jirapaet, Jirapaet, & Sopajaree, 2006; Manser, 2009; Simmons & Sherwood, 2010).

'Safety climate' is considered one of the critical dimensions of patient safety. It involves reporting and learning from events that occur (Hamdan, 2013). Our results revealed that only 41.1% of our participants reported the occurrence of at least one event in the last 12 months. This number is less than that reported by other studies (Hamdan, 2013; Poley et al., 2011; Profit et al., 2012). According to Hamdan (2013), the unwillingness of health care providers to report adverse events might be attributed to several reasons including: the prevailing punitive culture within the health care system, the lack of a proper reporting system, and social and liability concerns.

Strengths and Limitations

Our study has several strengths and a few limitations. The study strengths are reflected in the use of a census sample that included all nurses and physician working at NICU's in Gaza Strip and the high response rate of participants that was 88.1%. These facts add to the validity and generalizability of the results of the study among health care providers working in NICU at the Gaza Strip. One of the limitations of this study was depending on the memory of the staff to report on the number of events they encountered in the last 12 months which might have affected the real number reported as they might have forgotten some events. Unfortunately, the studied NICUs had no registry of events to compare to the number reported by participants. Another limitation was the absence of a clear definition of an incident event. This may leave the interpretation of events open to the perception of each participant who would then make his or her own definition. Although we achieved a high response rate, we cannot completely rule out non-responder bias, especially as the response rate was higher among nurses than physicians. Lastly, we acknowledge that the internal consistency test results showed relatively low Cronbach's α for the 'safety climate' (0.61) and 'teamwork climate' (0.62) domains. However, these values fall within the acceptable range (George & Mallery, 2003). These values reveal that the Arabic translation and adaptation of the tool would require further improvement before used in the future.

Implications for Practice and Policy Change

In our study, we assessed attitudes of nurses and doctors working at NICUs in the Gaza Strip hospitals towards safety culture issues. The low scores of safety culture reported by our participants should draw the attention of decision makers to patient safety culture in NICUs in Gaza hospitals. There is a need to design and implement patient safety programs that are customized to individual NICU needs in the studied

hospitals in the Gaza Strip. Furthermore, the researchers recommend that the hospital administrations provide in-service education to nurses and physicians and provide specific training programs that are tailored to address the special needs of each hospital.

Evidence shows that comprehensive unit based safety improvement programs that provided a framework for addressing patient safety culture issues can improve workforce perceptions and therefore improve safety culture at hospitals (Colla et al., 2005; Haerkens et al., 2012; Pettker et al., 2011; Sexton et al., 2011; Timmel et al., 2010). For example, the overall mean safety climate scores improved significantly by 9.7% after implementing a safety program in an ICU (Haerkens et al., 2012). Such results should serve as a motive for hospital administrations to prioritize and implement safety intervention programs that are customized to individual NICU needs in the Gaza Strip (Hamdan, 2013). Furthermore, several tools such as event-reporting systems, evidence-based guidelines, quality and safety dashboards and checklists are suggested to help improve safety culture (Dekker, 2007).

Finally, it is important to keep in mind that the biggest challenge to moving towards a safer health system is changing the culture from one of blaming individuals for errors to one in which errors are treated not as personal failures, but as opportunities to improve the system and lack of awareness of the extent to which errors occur daily in all health care settings and organizations. In today's health care systems, the vast majority of errors are not reported because of personnel fear to be punished (Institute of Medicine, Committee on Quality of Health Care in America, 2001, p. 79).

Conclusion

The results of the study revealed low levels of patient safety attitudes in all the SAQ subscales and identified opportunities for improving the patient safety culture in NICUs in the Gaza Strip. There is an urgent need to introduce new policies and programs to improve the safety cultures in Gaza NICUs. These measures need to be customized to the needs of each of these units. Priority needs to be given to the safety climate and incident reporting system. This should include policies and procedures to address any identified weaknesses. Moreover, hospital management should provide more support for patient safety and help ensure proper working conditions for the care providers in Gaza hospital NICUs. Finally, attention should be given to event reporting in NICUs as a key strategy for improving the safety of very vulnerable patients.

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