

Perception and Factors Associated with Patient Safety Culture in an Academic University Hospital in Palestine

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ABSTRACT

Background: Patient safety culture plays a pivotal role in enhancing care quality, preventing errors, promoting clinical outcomes, and reducing healthcare costs. It also helps minimize adverse events, increasing patient safety, and elevating the quality of medical care provided. This study aims to evaluate the perception of patient safety culture within a university hospital. It aims to examine the correlation between the demographic and workplace characteristics of the staff and their perceptions of patient safety culture. **Methods:** A quantitative cross-sectional study design was employed for this study. The Arabic version of the Hospital Survey of Patient Safety Culture (HSOPSC) v2.0 was used to evaluate the perception of patient safety culture among hospital staff. The survey was distributed to all staff via email using the Survey Monkey® online platform over two weeks. Descriptive statistics were used to measure the perception. The relationship between variables was determined using the Mann-Whitney U test, Kruskal-Wallis test, and multiple linear regression. **Results:** “Staffing and Workplace” (59.5%) and “Response to Error” (51.9%) were found the weakest composites. “Teamwork” (82.5%), and the “Organizational Learning—Continuous Improvement” (81.1%) were the highest positive composites. The rest of the composites were perceived positively. Nursing staff perceived the patient safety culture more positively than other professions (Mean Rank = 157.23, p-value. **Conclusions:** This study presents an assessment of patient safety culture among healthcare staff at a university hospital. The staff perceived the overall patient safety culture positively. However, efforts must be made to improve the two weak composites. A qualitative approach study could be done to explore deeply the reasons for this weakness in these composites. The demographics of the staff were not associated with patient safety culture.

Keywords: Patient Safety Culture, HSOPSC, Safety, Palestine.

BACKGROUND

Patient safety is defined as minimizing avoidable injuries or adverse events for patients and lowering the risk of unwanted harm from these injuries during the treatment process [1-2]. It is also defined as reducing and lessening the risk, mistakes, and harm that patients may experience when receiving medical care [3]. Patient safety is an important health concern [4-5]. It is considered the most important component of quality health care [6]. Patient safety culture is a component of organizational culture made up of employees' attitudes, beliefs, perceptions, values, and competencies concerning patient safety and the manner and competence of an institution's health and safety management [7].

The need for hospitals to create a culture of patient safety is growing along with the

need for high-quality healthcare [8]. Patient safety culture helps increase care quality, prevent mistakes, promote clinical outcomes, and lower healthcare expenditures [9]. It also helps reduce the number of undesirable incidents, which promotes patient safety and raises the standard of health care delivered [10]. However, there is a need to focus on system issues more than individuals, and this was highlighted in the report “To Err is Human: Building a Safer Health System” to create a culture of safety [11]. To prevent these injuries and harm to patients, healthcare systems and providers must improve the patient safety culture [12]. Moreover, it has been suggested that for healthcare organizations to enhance the patient safety culture. There should be effective departmental collaboration, constant organizational training, supportive leadership,

sufficient staffing, acknowledging unfavorable events, non-punitive attitudes toward events, and error reporting [8].

Patient safety culture reflects how patient safety is perceived by the healthcare provider [13]. The positive perception of healthcare staff is an important sign of patient safety treatment that might minimize mortality and morbidity, as well as the cost of healthcare and days of the stay [14]. Measuring the perception of patient safety culture can help healthcare organizations improve the weak areas perceived by the staff concerning safety culture and safety practices and improve quality management processes [15]. Many studies have shown that the perception of patient safety culture may differ greatly depending on staff characteristics and sociodemographics [16]. A deeper understanding of these differences may help healthcare administrators design efficient interventions tailored to particular staff groups and levels to enhance the patient safety culture. Therefore, understanding and measuring the effect of staff characteristics on staff perceptions of patient safety culture is crucial [17-18].

In Palestine, the concept of safety culture is rapidly developing within hospitals. Numerous initiatives have been launched across various hospitals to enhance the patient safety culture [19]. Moreover, many studies assessing patient safety culture were conducted in Palestine [4, 19-26]. Despite the conducted studies, there was only one study that assessed patient safety culture in an accredited university hospital; however, it was conducted on nurses. There is no published study assessing patient safety culture among all healthcare staff in an accredited university hospital in Palestine and assessing the factors that might affect it.

Therefore, the current study aims to assess the patient safety culture among healthcare staff in an accredited academic university hospital, providing a baseline for the existing safety culture that could be used for benchmarking with other accredited university hospitals in the region and internationally. This assessment will assist the university hospital in enhancing its patient safety standards. It also aims to examine factors that may affect patient safety culture. This study will provide

highlights and guidance for decision-makers to strengthen the culture of safety in the hospital and compare the levels between different professionals and units.

METHODS

Study Design

This study used a quantitative cross-sectional design, based on the STROBE guide for reporting cross-sectional studies [27].

Settings and Population

This study was conducted at An-Najah National University Hospital (NNUH), a tertiary university hospital in Palestine. The hospital delivers a wide range of health services, like oncology, surgical and medical, nephrology, pediatric, and intensive care services. It has been an accredited hospital by the Joint Commission International (JCI) since 2020.

The study sample included all staff - healthcare and non-healthcare- working at NNUH, regardless of their experience, work unit, or any other criteria. The total population was 600 staff. The only ones excluded were those who work for a third-party service like security.

Sample size calculation

The minimum sample size using a Raosoft® sample size calculator was 235, with a 5% margin of error, 95% confidence level, and 50% response distribution. These intervals are commonly used in this kind of study sampling because they strike a balance between precision and certainty. Using the Raosoft calculator is a commonly used approach for determining the sample size for such studies. 10% was added as an attrition rate to account for participants who might drop out. The final sample size was 258.

Instruments

Different approaches and methods were reported and recommended in the literature to evaluate and assess the culture of safety among healthcare providers; the quantitative methodology was the most commonly used [28-32]. The Hospital Survey of Patient Safety Culture (HSOPSC) tool is considered the most common tool used in the hospital setting [33-37].

The survey used for this study consisted of two parts. The first part included demographic data for the participants, including gender and age, and the rest of the demographics were included in the second part of the survey. All of the demographic variables in the survey were categorical. The second part included the Surveys on Patient Safety Culture (SOPS®) Hospital Survey Version 2.0 (SOPS Hospital Survey 2.0). The study used the Arabic version of this tool, which was translated by the Saudi Patient Safety Center, and the researcher sought approval to use this version from the center and the Agency for Healthcare Research and Quality (AHRQ). The HOSPSC was originally developed by the Agency of Health Research & Quality to assess the level of patient safety culture [38]. The updated version 2.0 was revised by the same agency in 2019, and it had very good reliability, ranging from 0.67 to 0.89 [39]. This tool is used to assess patient safety culture in hospitals and was used globally. The tool consists of 40 items, the first eight items ask participants how many events have been reported to provide an overall score for patient safety in their units and provide some background characteristics (working experience in the profession, hospital, and unit, working area and position, and interaction with patients). Thirty-two remaining items from the tool were grouped into 10 composites that assess areas of patient safety culture. These composites were “Communication About Error”, “Communication Openness”, “Handoffs and Information Exchange”, “Hospital Management Support for Patient Safety”, “Organizational Learning—Continuous Improvement”, “Reporting Patient Safety Events”, “Response to Error”, “Staffing”, “Work Pace, Supervisor, Manager, or Clinical Leader Support for Patient Safety”, and “Teamwork”. This tool used 5-point agreement scales “Strongly disagree”, “Disagree”, “Neither Agree nor Disagree”, “Agree”, “Strongly agree” or frequency scales (“Never”, “Rarely”, “Sometimes”, “Most of the time”, “Always”). It also included an option of “Does not apply or Don’t know” and an open-ended comment at the end. The composite scores for the tool were computed using frequencies and the average positive item scores. The simplest way to present the results was by calculating the frequency of response

for each survey item. This was done after combining the two lowest response categories (Strongly disagree/Disagree and Never/Rarely) and the two highest response categories (Strongly agree/Agree and Most of the time/Always). The two lowest response categories are the negative and the highest response categories are the positive. To measure the composite percent positive score, the average of the percent positive score for each item included in the composite was calculated. The average of all composite scores gives the overall positive score of patient safety culture at the hospital.

Pilot study

The pilot study involved 10 employees who provided feedback on the comprehensibility and language clarity of the questions used in the data collection. These employees were from the same hospital and different fields of nursing, physicians, and quality officers. The researchers then took into account valid comments from the pilot study participants and made the necessary modifications to the survey. The comments were on the way the demographic section was presented on the online survey, and some typing errors in the items when they were written on the online platform. None of the comments were regarding the original instrument items. Finally, the modified version was reviewed by experts in the healthcare field; nurses, one physician, and one healthcare academic researcher, to ensure the content and construct validity, which refers to the degree to which the questions accurately measure what they are intended to measure. This process helps to ensure the quality and reliability of the data collected in the main study. The researchers then calculated the Cronbach alpha for the survey, which was found to be 0.80. The Cronbach alpha for composites ranged from 0.70 to 0.86. Overall, the tool's Cronbach alpha coefficient was greater than the advised value of 0.70. The outcome would not contain the data from the pilot test.

Data Collection and Analysis

The study was conducted using an online survey method between July 25, 2022, and August 10, 2022. The survey was transferred from the PDF format received from the original institution of AHRQ and re-written on the

SurveyMonkey® online platform which is a very famous website for making and distributing online surveys to targeted participants. The researcher added the introduction and demographic questions at the beginning of this survey. The introduction of the survey included information regarding the confidentiality and privacy of the data gathered. Staff were informed that their participation was voluntary and that they had the right to withdraw from the study at any time. The survey then was ready to be sent to the staff through their work emails. Once they clicked the link sent, the survey opened and was filled out online. The researcher sent a reminder email to those who did not complete the survey after one week of sending the primary email.

The data was gathered from the online platform for the completed surveys. The data was then cleaned and coded using Microsoft Excel 2021. The Statistical Package for the Social Sciences (SPSS) v26 was used to analyze the data using descriptive statistics and inferential statistics. The data was not normally distributed based on the Shapiro–Wilk test (p -value < 0.001). The most common tests for normality are the Shapiro–Wilk test and Kolmogorov-Smirnov test. The Shapiro-Wilk test is often suggested by some researchers as the optimal method for determining if data follows a normal distribution [40]. Therefore, non-parametric tests were used. Man-Whitney, Kruskal-Wallis, and multiple linear regression were used to find the relations between the variables. Significance was considered when the P -value was < 0.05 .

The total score of patient safety culture composites was considered the continuous

variable in the analysis. However, the demographic characteristics and work characteristics of the participants were all considered categorical variables. For measuring the composites of patient safety culture, the AHRQ Hospital Survey on Patient Safety Culture Version 2.0 User's Guide was used [41].

RESULTS

Participant characteristics

The survey was sent to 600 employees. 265 completed surveys were returned. Male participants were the majority (55.5%, $n = 147$), while females were 44.5% ($n = 118$). Most of the participants' ages were between 30 and 34 years (37%, $n = 98$) and between 25 and 29 years (30.9%, $n = 82$). The majority of participants were working in Patient Care Units (41.5%, $n = 110$), and 77.4% of the participants ($n = 205$) had direct contact or interaction with patients. Nurses were the majority of the participants in this study (46.4%, $n = 127$); the rest of the participants were from different positions, as can be seen in Table 1.

Most of the participants worked in their current profession or specialty for 6 to 10 years (41.1%, $n = 109$) and from 1 to 5 years (35.8%, $n = 95$). However, most of them worked in this hospital for 1 to 5 years (50.2%, $n = 133$) and from 6 to 10 years (46%, $n = 122$). When looking into their experience in the current unit or work area, most of them were working for 1 to 5 years (67.9%, $n = 180$). The majority of the participants, accounting for 64.2% ($n = 170$), were working between 30 and 40 hours per week. The rest of the demographic characteristics of the participants can be seen in Table 1.

Table (1): Characteristics of participants.

Variable	Categories	Frequency	Percentage
Gender	Male	147	55.5 %
	Female	118	44.5 %
Age	Less than 25 years	32	12.1 %
	25 - 29	82	30.9 %
	30 - 34	98	37 %
	35 - 39	31	11.7 %
	40 and above	22	8.3 %

Variable	Categories	Frequency	Percentage
Total experience in the profession/specialty	Less than 1 year	2	0.8 %
	1 to 5 years	95	35.8 %
	6 to 10 years	109	41.1 %
	11 or more years	59	22.3 %
Experience in the current hospital	Less than 1 year	8	3 %
	1 to 5 years	133	50.2 %
	6 to 10 years	122	46 %
	11 or more years	2	0.8 %
Experience in current unit/work area	Less than 1 year	17	6.4 %
	1 to 5 years	180	67.9 %
	6 to 10 years	68	25.7 %
	11 or more years	-	-
Total working hours per week	Less than 30 hours per week	14	5.3 %
	30 to 40 hours per week	170	64.2 %
	More than 40 hours per week	81	30.6 %
Position in this hospital	Nursing	127	47.9 %
	Supervisor, Manager, Clinical Leader, Senior Leader	37	14 %
	Medical	28	10.6 %
	Support	29	10.9 %
	Other Clinical Positions	44	16.6 %
Primary area of work in this hospital	Multiple Units - No specific unit	26	9.8 %
	Surgical Services	20	7.5 %
	Support Services	8	3 %
	Medical/Surgical Units	33	12.5 %
	Clinical Services	32	12.1 %
	Patient Care Units	110	41.5 %
	Administration/Management	17	6.4 %
	Other	19	7.2 %
Do you recommend your family members or loved ones be treated in this hospital?	Yes	242	91.3 %
	No	23	8.7 %
Direct interaction or contact with patients?	Yes	205	77.4 %
	No	60	22.6 %
Total Responses		265	100 %

Safety culture perception of the participants

The total average positive score of the ten composites was 71.24%, ranging from 51.9% to 82.5%. The findings of the study showed that patient safety ratings by the staff ranged between very good (43%, $n = 114$) and excellent (38.3%, $n = 106$). However, very few of them rated patient safety as poor (2.6%, $n = 7$) or fair (4.5%, $n = 12$).

The participating staff at the hospital had a positive perception of most of the compo-

sites of the patient safety culture. The composite that received the highest percentage was "Teamwork", with a score of 82.5%. This was closely followed by the "Organizational Learning—Continuous Improvement" composite, which scored 81.1%. The remaining composites also showed positive scores (see Table 2). However, the "Response to Error" composite received the lowest score at 51.9%, and the "Staffing and Work Place" composite scored slightly higher at 59.5%.

Table (2): Patient Safety Culture Composites.

Item Number	Composite / Item	Strongly Disagree / Disagree OR Never / Rarely	Neither Agree nor Disagree	Agree / Strongly Agree OR Most of the time / Always	Total Responses	Average Percent Positive Response
1	Teamwork					82.5%
A1	In this unit, we work together as an effective team	13	18	234	278	88.3%
A8	During busy times, staff in this unit help each other.	15	27	219	274	83.9%
A9	There is a problem with disrespectful behavior by those working in this unit. (negatively worded)	197	30	35	274	75.2%
2	Staffing and Work Place					59.5%
A2	In this unit, we have enough staff to handle the workload.	72	33	159	277	60.2%
A3	Staff in this unit work longer hours than is best for patient care. (negatively worded)	145	43	67	267	56.9%
A5	This unit relies too much on temporary, float, or PRN staff. (negatively worded)	144	41	59	257	59.0%
A11	The work pace in this unit is so rushed that it negatively affects patient safety. (negatively worded)	158	49	48	267	62.0%
3	Organizational Learning—Continuous Improvement					81.1%
A4	This unit regularly reviews work processes to determine if changes are needed to improve patient safety.	16	25	217	271	84.1%

Item Number	Composite / Item	Strongly Disagree / Disagree OR Never / Rarely	Neither Agree nor Disagree	Agree / Strongly Agree OR Most of the time / Always	Total Responses	Average Percent Positive Response
A12	In this unit, changes to improve patient safety are evaluated to see how well they worked	19	31	202	264	80.2%
A14	This unit lets the same patient safety problems keep happening. (negatively worded)	202	30	24	269	78.9%
4	Response to Error					51.9%
A6	In this unit, staff feel like their mistakes are held against them. (negatively worded)	117	57	86	272	45.0%
A7	When an event is reported in this unit, it feels like the person is being written up, not the problem. (negatively worded)	114	53	94	273	43.7%
A10	When staff make errors, this unit focuses on learning rather than blaming individuals.	41	36	188	278	70.9%
A13	In this unit, there is a lack of support for staff involved in patient safety errors. (negatively worded)	120	78	52	263	48.0%
5	Supervisor, Manager, or Clinical Leader Support for Patient Safety					75.9%
B1	My supervisor, manager, or clinical leader seriously considers staff suggestions for improving patient safety.	19	33	208	272	80.0%
B2	My supervisor, manager, or clinical leader wants us to work faster during busy times, even if it means taking shortcuts. (negatively worded)	174	43	45	273	66.4%
B3	My supervisor, manager, or clinical leader takes action to address patient safety concerns that are brought to their attention.	14	35	211	272	81.2%
6	Communication About Error					76.8%
C1	We are informed about errors that happen in this unit.	19	49	188	268	73.4%

Item Number	Composite / Item	Strongly Disagree / Disagree OR Never / Rarely	Neither Agree nor Disagree	Agree / Strongly Agree OR Most of the time / Always	Total Responses	Average Percent Positive Response
C2	When errors happen in this unit, we discuss ways to prevent them from happening again.	15	40	204	270	78.8%
C3	In this unit, we are informed about changes that are made based on event reports.	19	37	202	268	78.3%
7	Communication Openness					69.9%
C4	In this unit, staff speak up if they see something that may negatively affect patient care.	9	27	218	266	85.8%
C5	When staff in this unit see someone with more authority doing something unsafe for patients, they speak up.	45	41	149	245	63.4%
C6	When staff in this unit speak up, those with more authority are open to their patient safety concerns.	26	53	167	256	67.9%
C7	In this unit, staff are afraid to ask questions when something does not seem right. (negatively worded)	151	47	44	252	62.4%
8	Reporting Patient Safety Events					71.7%
D1	When a mistake is caught and corrected before reaching the patient, how often is this reported?	33	47	160	251	66.7%
D2	When a mistake reaches the patient and could have harmed the patient, but did not, how often is this reported?	18	37	182	248	76.8%
9	Hospital Management Support for Patient Safety					72.4%
F1	The actions of hospital management show that patient safety is a top priority.	15	22	224	273	85.8%
F2	Hospital management provides adequate resources to improve patient safety.	15	17	226	271	87.6%
F3	Hospital management seems interested in patient safety	111	55	87	265	43.9%

Item Number	Composite / Item	Strongly Disagree / Disagree OR Never / Rarely	Neither Agree nor Disagree	Agree / Strongly Agree OR Most of the time / Always	Total Responses	Average Percent Positive Response
	only after an adverse event happens. (negatively worded)					
10	Handoffs and Information Exchange					70.7%
F4	When transferring patients from one unit to another, important information is often left out. (negatively worded)	153	44	35	242	65.9%
F5	During shift changes, important patient care information is often left out. (negatively worded)	159	40	26	235	70.7%
F6	During shift changes, there is adequate time to exchange all key patient care information.	24	32	173	238	75.5%
Overall Perception						71.24%
	Number of Events Reported	None	1 to 2	3 to 5	6 to 10	11 or more
D3	In the past 12 months, how many patient safety events have you reported?	129 (48.7%)	67 (25.3%)	46 (17.4%)	13 (4.9%)	10 (3.6%)
	Patient Safety Rating	Poor	Fair	Good	Very Good	Excellent
E1	How would you rate your unit/work area on patient safety?	7 (2.6%)	12 (4.5%)	30 (11.3%)	114 (43%)	106 (38.3%)

Factors associated with patient safety culture

This study found that nursing staff perceived a patient safety culture more positively than any other position in the hospital (Mean Rank =157.23, p-value <0.001). Staff who work in patient care units perceived patient safety culture more positively than other staff who work in other units in the hospital (Mean Rank =150.86, p-value =0.007). The study

also found that staff who had direct contact or interaction with patients had a more positive perception of the patient safety culture (Mean Rank =141.90, p-value <0.001). Other variables like gender, age, experience in the current profession, experience in the hospital, experience in the current unit, and working hours per week were found not to be associated with patient safety culture (see Table 3).

Table (3): Factors associated with patient safety culture.

Item	Category	N	Mean Rank	Median [Q1–Q3]	P-value
Gender	Male	147	137.64	108.00 [99.00–112.00]	0.271
	Female	118	127.22	105.00 [95.00–112.00]	

Item	Category	N	Mean Rank	Median [Q1–Q3]	P-value
Age	Less than 25	32	142.63	107.00 [100.75–112.50]	0.460
	25 - 29	82	143.26	108.00 [100.00–113.00]	
	30 - 34	98	126.81	106.00 [96.75–112.00]	
	35 - 39	31	120.66	105.00 [91.00–111.00]	
	40 and above	22	125.70	104.50 [91.25–112.75]	
Position in this hospital	Nursing	127	157.23	109.00 [103.00–113.00]	<0.001*
	Supervisor, Manager, Clinical Leader, Senior Leader	37	139.74	108.00 [99.50–112.00]	
	Medical	28	109.18	98.00 [85.75–113.50]	
	Support	29	88.29	99.00 [76.00–109.00]	
	Other Clinical Positions	44	102.01	102.00 [92.50–107.50]	
Primary unit or work area of this hospital	Multiple Units - No specific unit	26	104.17	103.00 [89.25–110.25]	0.007*
	Surgical Services	20	121.05	105.00 [98.00–112.00]	
	Support Services	8	95.19	98.50 [82.00–110.25]	
	Medical/Surgical Units	33	150.36	109.00 [99.50–113.00]	
	Clinical Services	32	112.69	101.00 [92.50–109.75]	
	Patient Care Units	110	150.86	108.00 [102.75–113.00]	
	Administration/Management	17	134.50	109.00 [101.00–111.50]	
	Other	19	100.24	104.00 [75.00–109.00]	
Experience in the current profession	Less than 1 year	2	84.50	100.50 [98.00–0]	0.745
	1 to 5 years	95	133.95	106.00 [98.00–112.00]	
	6 to 10 years	109	135.85	107.00 [98.50–113.00]	
	11 or more years	59	127.85	106.00 [97.00–111.00]	
Experience in hospital	Less than 1 year	8	129.50	103.50 [97.25–114.00]	0.432
	1 to 5 years	133	129.55	106.00 [95.00–112.00]	
	6 to 10 years	122	135.64	107.50 [99.00–113.00]	
	11 or more years	2	215.50	115.00 [111.00–0]	
	Less than 1 year	17	140.41	109.00 [99.50–114.00]	0.724

Item	Category	N	Mean Rank	Median [Q1–Q3]	P-value
Experience in the current unit	1 to 5 years	180	134.55	106.50 [98.25–112.00]	
	6 to 10 years	68	127.04	105.50 [94.50–111.75]	
Working Hours per week	Less than 30 hours per week	14	148.86	109.00 [98.75–114.75]	0.292
	30 to 40 hours per week	170	136.63	107.00 [99.75–112.00]	
	More than 40 hours per week	81	122.65	105.00 [91.50–112.50]	
Direct Interaction or contact with patients	Yes	205	141.90	108.00 [99.50–113.00]	<0.001*
	No	60	102.60	102.50 [88.25–109.00]	

*Significance level $p < 0.05$

Predictors of patient safety culture

After using multiple linear regression analysis, this study showed that there was a statistically significant association between the total score of patient safety culture composites and staff position in the hospital (p -value = 0.003, VIF = 1.179). The study also showed a statistically significant association between

those who have direct interaction or contact with patients and the total score of patient safety culture composites (p -value = 0.003, VIF = 1.208). However, the regression showed no significant association between the total score of the patient safety culture composites and the staff's primary working area or unit (p -value = 0.705, VIF = 1.027) (see Table 4).

Table (4): Predictors of patient safety culture.

Predictor	<i>b</i>	B	t	P-value	95.0% Confidence Interval		VIF
					Lower	upper	
Constant	114.409		41.561	<.001	108.989	119.830	
Position in this hospital	-.623	-.194	-3.047	.003*	-1.026	-.220	1.179
Primary unit or work area of this hospital	.037	.023	.379	.705	-.156	.230	1.027
In your staff position, do you typically have direct interaction or contact with patients?	-6.712	-.194	-3.005	.003*	-11.110	-2.314	1.208

$R = .321$; R Square = .101; adjusted R Square = .093, $F = 9.983$, $df = 3$, $p = 0.000$

*Significance level $p < 0.05$

DISCUSSION

This study aimed to assess the perception of patient safety culture in a university hospital in Palestine. The survey link was distributed through work emails, and a reminder was sent a week later. The author stopped the survey link after two weeks because the required

calculated sample size of completed surveys was reached.

The study found that staff perceived most of the composites of safety culture positively. However, the highest positive composite was "Teamwork" and "Organizational Learning—Continuous Improvement". This result was

like the results of different studies [15, 42-46]. The Agency of Healthcare Research & Quality also reported in its user database report that "Teamwork" was the highest positive composite (82%) as perceived by healthcare staff [47]. This is also similar to what was found by [46, 48-50] that teamwork was the most positive composite perceived by the staff.

The study revealed two areas that need improvement: "Staffing and Workplace" and "Response to Error". These two composites are considered weak according to the AHRQ survey guide, which recommends considering areas below 0.60 as weak [41]. The results are consistent with other studies [45, 49, 51-53] which revealed that the composite of staffing and response to error was the lowest perceived composite by the staff in hospitals. "Staffing" was also reported as the weakest composite by Laborde et al. [54] and Granel-Giménez et al. [50]. Staffing is an important issue when it comes to patient safety, and it is correlated with working conditions that may affect patient safety [55]. Nursing administration could improve staff working conditions by managing nurse-to-patient ratios and reducing workload, as these issues were found to influence the perception of safety culture [56, 57]. The staff working at this hospital are still young and the hospital is new; the accreditation standards require efforts from the staff, who may find themselves stressed and working under pressure, and thus may increase the chances of making errors. Working in areas with no optimum staffing and with work overload could increase staff stress and burnout and affect their work performance, which may affect their perception of patient safety culture [53].

When adverse events are reported, health organizations can study these events and take preventative action to reduce the likelihood of future occurrences. Many studies have found that staff may feel uncomfortable or have a feeling of fear of reporting events that occurred [14]. The weakness revealed in the composite of "Response to error" was like what was found in other studies [1, 14, 42, 58]. The apprehension of potential disciplinary action is a significant deterrent for staff members when it comes to reporting mistakes [58, 59]. Therefore, hospitals and healthcare systems need to stop criticizing their staff for mistakes

and start looking at mistakes as an opportunity to learn, enhance the system, and protect patients. To encourage staff to discuss errors and report mistakes, managers must constantly interact with and provide feedback to their teams about mistakes and events that occur [60]. They also have to educate staff about the benefits of reporting events and mistakes to improve the patient safety culture.

The study showed that nurses had a more positive perception of patient safety culture compared to other healthcare professionals and non-clinical staff. A study conducted by Tran et al. [61] in public hospitals in Vietnam found that nurses perceived certain aspects of the safety culture significantly more than physicians and other clinicians. This is also congruent with a study conducted by Stoyanova et al. [52] and Rajalatchumi et al. [62] that found that nurses positively perceived safety culture more than other healthcare professionals. This could be due to the nature of nurses' work, as they are the first-line treatment personnel with patients, and have more direct contact with patients involving medication administration and other safety-related procedures. This positive response by nurses may be because the nursing staff has control over the majority of the reporting systems. However, other studies found that physicians perceived patient safety culture better than other professionals [63, 64]. This may reflect that the perception of patient safety culture may differ among healthcare professionals in different healthcare settings.

Other results of the study showed that staff with direct contact with the patient perceived patient safety culture more positively than those who did not have direct contact or interaction with patients. This result may be due to the improved comprehension of healthcare professionals working with patients directly, enabling them to quickly and accurately understand the patient's needs and concerns. However, the results were not in line with similar studies like those conducted in Ethiopia by Kumbi et al. [15].

The study revealed that other factors such as age, gender, educational level, marital status, experience in the hospital, and experience in the profession have no significant impact on patient safety culture. These results are in line

with similar studies. For instance, age was found to not be significantly related to patient safety culture Abu-El-Noor et al. [14]; Ayisa et al. [46]; and Kumbi et al. [15]. This may be because most of the hospital staff were young and in the middle age groups, and their ages are close to each other. Another variable that is not related to patient safety culture is gender. This is in agreement with previous studies by Gambashidze et al. [16]; Kumbi et al. [15]; Odu et al. [65]; and Østergaard et al. [66]. This might need more focus to investigate the gender differences in perceptions for each dimension of safety culture, or using qualitative methods. Another example of a variable not significantly related to patient safety culture was “experience in the profession”. This is in line with similar studies by Abu-El-Noor et al. [14]; Ayisa et al. [46]; and Huong Tran et al. [44]. This result might be because the staff were young and did not have too much experience in the profession; most of them were employed in this hospital from the beginning of their careers.

Study Limitations

The study used a widely used and well-validated tool, and it was conducted in a large tertiary hospital that has made huge efforts to improve the safety of its patients in Palestine. The study used a cross-sectional approach to examine the patient safety culture at a specific point using the online survey method for a short period. The results do not reflect NNUH's continuous efforts to enhance patient safety. Moreover, the study was conducted at a single tertiary hospital, so it is better to conduct the study in multiple hospitals in Palestine to enhance the generalizability of the result. Future studies using qualitative approaches can be conducted to better understand the experiences of healthcare staff with a patient safety culture.

CONCLUSIONS

This study presents an overall assessment of patient safety culture perception among healthcare staff in an accredited university hospital using HSOPSC v2.0. “The participants reported a positive perception in most of the composites. However, they identified two composites that need improvements: “Staffing and Workplace” and “Response to Error”. Despite the weaknesses in these two composites,

it is considered not extreme.” To improve patient safety culture, hospital administrators must implement just culture principles, encourage team training, develop clear patient safety programs, mobilize resources to reallocate and increase staff numbers in the units, enhance the regulations to promote non-punitive reporting, stop blaming the staff, and start to improve the processes and the system. They must continuously communicate with their staff on the importance of error reporting to improve the patient safety culture. Moreover, the management of the hospital must put more effort into exhibiting a patient safety culture-focused leadership style that extends to clinical practice. They must also encourage the practice of safety culture when dealing with various event reports. The hospital must continue and increase its efforts to include safety training in its learning programs. The study shows how nurses are more positive toward patient safety culture because they have more direct contact with patients. Hospital administrators must motivate these staff and encourage their participation in decision-making regarding patient safety.

The results of this study may help in policy improvements that aim to enhance the systems and processes that control hospital safety measures. It gives hospital administration an insight into challenges and areas that may need enhancements and a comparison between different units and positions, which will ease and guide the enhancement projects more easily.

List of abbreviations

NNUH, An-Najah National University Hospital; JCIA, Joint Commission International Accreditation; HSOPSC, Hospital Survey of Patient Safety Culture; AHRQ, Agency for Healthcare Research and Quality; PSC, Patient Safety Culture; SOPS®, Surveys on Patient Safety Culture; IRB, Institutional Review Board; SPSS: Statistical Software Package for the Social Sciences; Q1: First quartile; Q3: Third quartile;

DECLARATIONS

Ethics approval and consent to participate

The *Institutional Review Board (IRB)* of the Arab American University has approved

the current study under the reference number [2023/A/44/N]. Completion of the survey was presumed as informed consent since the survey was sent through emails by the Survey-Monkey® account. The cover page also explained the study objectives and the way to answer questions. Participation was voluntary and anonymous. The primary researcher's phone number was made available to participants for any inquiries or information. The information gathered was used solely for research needs and was then held anonymous and confidential. No incentives were given to the participants to fill out the survey. The requirement for written informed consent was waived by the *Ethical Committee of An-Najah National University Hospital* since the study was deemed a minimal risk and all methods were carried out following relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The data sets supporting the current research results are stored on a personal hard drive and available from the corresponding author upon request.

Competing interests

The author declares that they have no competing interests.

Authors' contributions

LZ designed the study, reviewed the literature, performed data collection and data analysis, and wrote the draft manuscript. He also coordinated the data, critically reviewed the manuscript to improve intellectual content, and reviewed the final manuscript.

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