

Work Environment Perception as a Predictor of Patient Safety Culture among Nurses at Al-Ahrar Teaching Hospital

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Abstract:

Background: patient safety is a basic goal of all healthcare organizations. One of the bigger knowledge gaps is how workplace factors influence safety outcomes. **The aim of the study:** was to assess work environment perception as a predictor of patient safety culture among nurses at Al- Ahrar Teaching Hospital. **Subjects & methods: Research design:** A descriptive cross-sectional survey design. **Setting:** This study was conducted at Al-AhrarTeachingHospital, SharqiaGovernorate,-Egypt. **Subjects:** Convenience samples of 345 nursing staff members. **Tools of data collection:** A self-administered questionnaire sheets were used for data collection: 1) personal data. 2) Work environment scale which includes 31 items categorized into the following five subscales: nurse participation in hospital affairs (nine items); nurse manager ability, leadership, and support of nurses (five items); nurse foundations for quality of care (ten items); collegial nurse–physician relations (three items); and staffing and resource adequacy (four items). 3) Patient safety culture survey which includes 12 dimensions. **Results:** revealed that, there was highly statistically significant relation ($P= 0.000$) between the nurses' perception regarding their work environment and their perception regarding patient safety culture. **Conclusion:** Improving the patient safety culture among nurses may be achieved through an enhancement their work environment perception.

Recommendations: Improving the nursing practice environment using several measures, and in-service training program about nurse practice environment and patient safety for studied nurses should be conducted.

Keywords: Work environment perception, Predictor, Patient safety culture, Nurses.

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I. Introduction

In all hospitals, nurses play a vital role in ensuring patient safety due to the nature of their work, which involves ongoing patient monitoring and coordination of care [1]. Moreover, nurses provide round-the-clock bedside care and spend more time with patients than any other health care professionals [2]. In hospitals, nurses maintain and manage the environment surrounding the delivery of care, which has increasingly involved coordinating the care activities provided by other health care providers. Hence, improvements in nurses' practice environments are essential to retain nurses and keep patients safe [3].

Work environment refers to the perception workers have regarding elements of the organization [4]. Nurse work environment is defined as 'the organizational characteristics of a work setting that easier or constrain professional nursing practice[5]. Often the nurse work environment was operationalized as a hospital-level factor [1, 6, 7, 8]. A healthy nursing work environment is defined as a safe, empowering and satisfying workplace, [9].

According to [10, 11], the health care environment can be a stressful place to work. Moreover, [12] suggested that improving nurse work environments can be an effective strategy to improve quality of care. The work environment is favorable to nursing practice, the professionals nursing approves the quality of care and the indicators tended reducing adverse events and length of stay[13]. It is clear that the stakes are high – the actions needed to address the issues need to be explored and the strategies related to building and sustaining a healthy work environment need to be accessible [14].

Patient safety has become a primary focus for healthcare organizations worldwide, and a prerequisite for the provision of effective quality care [15]. As the same, patient safety and the quality of patient care are a primary concern for health care providers and patients. [16, 17]. Patient safety depends on an organizational culture that harnesses the commitment of all staff. Such an aspect of organizational culture is usually termed 'patient safety culture', where members of the organization share values, beliefs and norms related to patient safety [18].

Patient safety culture is defined as the shared values among members about what is important, their beliefs about how they work in the organization, and their interaction with the work of organizational failures and systems, which together produce behavioral norms in the organization [19].

The creation and implementation of a safety culture in health institutions poses a challenge to managers and researchers [20, 21]. However, challenge to create a culture where information about safety can be shared without fear of reprisal. There remains significant reluctance amongst healthcare providers to share information around errors thus giving rise to a climate of guilt, shame, and silence [22].

Event reporting, communication, patient safety leadership and management, staffing, and accreditation were identified as key predictors of patient safety culture. Revitalize practices that address these issues. Investing in practices that tackle these issues and prioritizing patient safety is important in Lebanese hospitals in order to improve patient safety [23]. Several studies have investigated the underlying cultural factors present within an organization at organizational and individual levels in relation to safety culture with different measurements, techniques and modes, so that the contributing factors are understood. Thus, managers and leaders are encouraged to establish and sustain safety culture, as it is fundamental to total systems safety [24].

Major health care settings such as the WHO, National Patient Safety Foundation, the Joint Commission International and the Institute for Health Care Improvement are motivated the health care settings to develop a culture of safety as an effective strategy for sustainable safety improvement [25]. Indeed, health care institutions such as hospitals are urged to evaluate their patient safety culture in order to improve safety, quality, and patient outcome [26]. Furthermore, the European strategic directions for strengthening nursing toward health 2020 goals is to promote a positive work environment [27]. Patient safety remains a global problem that affects the developed and developing countries. Health care organizations should focus on the need of assessing safety culture as that will provide basic understanding of the safety-related perceptions of their staff. Safety culture assessment tools can help health care organizations in identifying the areas for improvement [28]. However, assessing the existing patient safety culture gives hospital management a clear vision of an organization's strengths and weaknesses [29]. Whenever, [30], concluded that improving nurse's attitudes toward incident reporting can be achieved with a broad approach that includes improvements in work environment and patient safety culture.

In one study conducted in a developing country (Turkey) about the work environment and empowerment as predictors of patient safety culture, [31] concluded that an enhancement of the work environment and providing access to empowerment structures may help health care organizations improve the patient safety culture. Al-Ahrar Teaching Hospital is experiencing challenges such as diversity, international competition or globalization, mergers, take-over, etc. Thus, there is a need to develop their own unique patient safety cultures and work environment perception shapes the character of an organization.

There are no studies on nurse work environment or patient safety culture in Al-Ahrar Teaching hospital, however, the aim of the study in this research was to assess work environment perception as a predictor of patient safety culture among nurses at Al-Ahrar Teaching Hospital.

The objectives were to:

- a) Assess the nurses' perception of the work environment at Al-Ahrar Teaching Hospital.
- b) Examine patient safety culture among nurses at Al-Ahrar Teaching Hospital.
- c) Explore the relationships between nurses' perception regarding work environment and patient safety culture at Al-Ahrar Teaching Hospital.

Research questions:

1. What is the nurses' perception regarding their work environment at Al-Ahrar Teaching Hospital?
2. What is the level of patient safety culture among nurses at Al-Ahrar Teaching Hospital?
3. Is there a relationship between nurses' perception regarding work environment and patient safety culture at Al-Ahrar Teaching Hospital?

II. Materials and methods

Research Design: A descriptive cross-sectional survey design was used to achieve the aim of the present study.

Setting: This study was conducted at Al-Ahrar Teaching Hospital, Sharqia Governorate, Egypt. The hospital is affiliated to ministry of health. That includes fifteen departments involving: emergency, general medicine, cardio thoracic, pediatric, etc...

Subjects: The data were obtained from a self-administered questionnaire survey completed in 2017. A convenience sample of 345 subjects included all available nurses who have more than one year of experience,

responsible for providing nursing care to patients at time of data collection and nurse who accept to participate in the study.

Tools of data collection: Three tools of data collection were used;

Tool I: personal characteristics of the nurses, these were: age, sex, educational qualification, years of experience, and work hours.

Tool II: work environment scale developed by [5]. It was modified by the researcher. It includes 31 items categorized into the following five subscales: nurse participation in hospital affairs (nine items); nurse manager ability, leadership, and support of nurses (five items); nurse foundations for quality of care (ten items); collegial nurse–physician relations (three items); and staffing and resource adequacy (four items). Each item rated on a five-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). The total score of 31 items ranged from 31 to 155. The nurses are considered to have a positive perception regarding their work environment if the total score (>116), and negative perception regarding their work environment if the total score (<116).

Tool III: Patient safety culture was measured by the Hospital Survey on Patient Safety Culture (HSPSC) which was developed by the Agency for Healthcare Research and Quality (AHRQ) in the USA [32]. It includes 12 dimensions. The total items are 42 items. Each item rated on a five-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). The total score of 42 items ranged from 42 to 210. The nurses are considered to have high perception regarding patient safety culture if the total score (≥ 158), moderate perception if the total score ($\geq 105 - < 158$), and low perception regarding patient safety culture if the total score (< 105).

Validity:

The study tools were translated into Arabic. Face and content validity was established and tested by taking the opinions of a panel of seven expertise from faculties of nursing: professors and assistant professor from Nursing Administration Department at the Faculty of Nursing, Cairo, Ain Shams, and Zagazig University-Egypt.

Tools Reliability:

Reliability of tools were tested by using Cronbach's Alpha coefficient test, which revealed that the tool II (work environment scale) and tool III (HSPSC) consisted of relatively homogenous items as indicated by high reliability = 0.741 and 0.869, respectively.

Filed work:

In the implementation phase, the researchers copied 400 sheets for any lost sheets and to ensure the collection of the required data. Data collection took two months; July and August 2017 at Al-Ahrar Teaching Hospital. The researchers began to collect data from all staff nurses by explaining to each participant the aim of the study and taking his / her acceptance and explaining the questionnaire and how to file the sheet. Filling the questionnaire sheets ranged from 30-45 minutes.

Pilot Study:

A pilot study was carried on forty nurses in Al-Ahrar Teaching Hospital. The purpose of the pilot study was to ascertain the clarity, applicability, and relevance of the questions. The subjects included in the pilot study were excluded from the main study sample to ensure the stability of the answers.

Administrative and ethical considerations:

Before any attempt to collect data, a managerial arrangements and official permission were obtained from the nursing director at Al-Ahrar Teaching Hospital to select the samples, to conduct the study and to collect the data. The researchers explained the aim of the study to the respondents to obtain their acceptance for data collection which considered confidential.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) version 20 was used for data analysis. Descriptive statistics were used to answer the research questions. Descriptive statistics (frequency, percentage, arithmetic mean and standard deviation) were used to describe the demographic characteristics of the nurses, their work environment perception, and patient safety culture perception. One sample T-test was used to examine the

differences between the nurses. Fisher's exact test was used to examine the relations between variables if there is small expected value. A highly statistically significant difference was considered at p-value $p \leq 0.001$

III. Results

Table (1) Distribution of the studied nurses according to their demographic characteristics. (n = 345)

Characteristics	No	%
Age		
- 20-30	190	55.1
- 31-40	132	38.3
- 41-50	23	6.7
- > 50	0	0.0
Mean ± SD	30.32± 6.50 years	
Years of experience in the same units		
- < 5 year	138	40.0
- 5 - 10 years	187	54.2
- > 10 years	20	5.8
Mean ± SD	6.30±2.69 years	
Gender		
- Male	32	9.3
- Female	313	90.7
Work hours per week		
- < 30 h/week	61	17.7
- 30-60 h/week	241	69.9
- > 60 h/week	43	12.5
Mean ± SD	48.37±13.50 h/week	
Direct patients contact		
- Yes	336	97.4
- No	9	2.6

Table (1) shows demographic characteristics of the studied nurses. It was clear that 55.5% of the nurses were aged from 20-30 years, with a mean of age 30.32 ± 6.50 years. As regard years of experience, 54.2% of nurses were experienced from 5-10 years in the same unit, with a mean of 6.30 ± 2.69 years. Furthermore, the majority (90.7%) of them were females. In addition, 69.9% of nurses were working 30-60 h/week, with a mean of 48.37 ± 13.50 h/week. Also, the majority (97.4%) of them had direct patients contact.

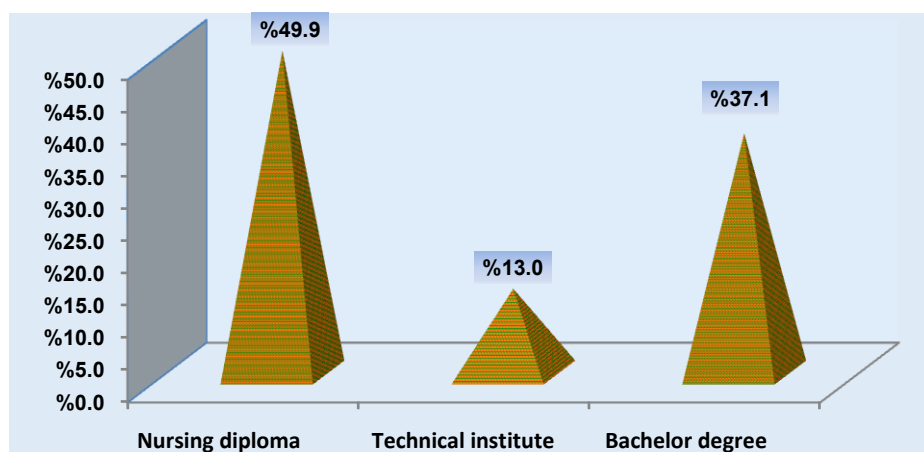


Fig. (1) Distribution of the nurses according to their educational qualification (n = 345)

Figure (1) illustrates the distribution of the nurses according to their educational qualification. It was found that, about half of them (49.9%) had nursing diploma.

Table (2) Mean scores of the work environment perception among the studied nurses (n = 345).

Work environment	Maximum score	Mean	SD	t-test	P-value
- Nurse participation in hospital affairs	45	23.52	2.03	214.338	0.000**
- Nursing foundations for quality of care	50	28.39	3.23	163.033	0.000**
- Nurse manager ability, leadership, and support of nurses	25	15.27	2.93	96.743	0.000**
- Staffing and resource adequacy	20	14.42	1.91	139.655	0.000**
- Collegial nurse-physician relations	15	12.39	3.25	70.753	0.000**
- Total	155	101.01	7.75	241.892	0.000**

T-test = One sample t test, **A highly statistical significant difference (P ≤ .001)

Table (2) represents the mean scores of the work environment perception among the studied nurses. The mean score of nurses' work environment subscale were (23.52±2.03, 28.39±3.23, 15.27±2.93, 14.42±1.91, and 12.39±3.25) related to nurse participation in hospital affairs, nursing foundations for quality of care, nurse manager ability, leadership, and support of nurses, staffing and resource adequacy, and collegial nurse-physician relations, respectively. Also, the total work environment perception mean score was (101.01±7.75), with statistical significant differences between the studied nurses regarding their work environment perception.

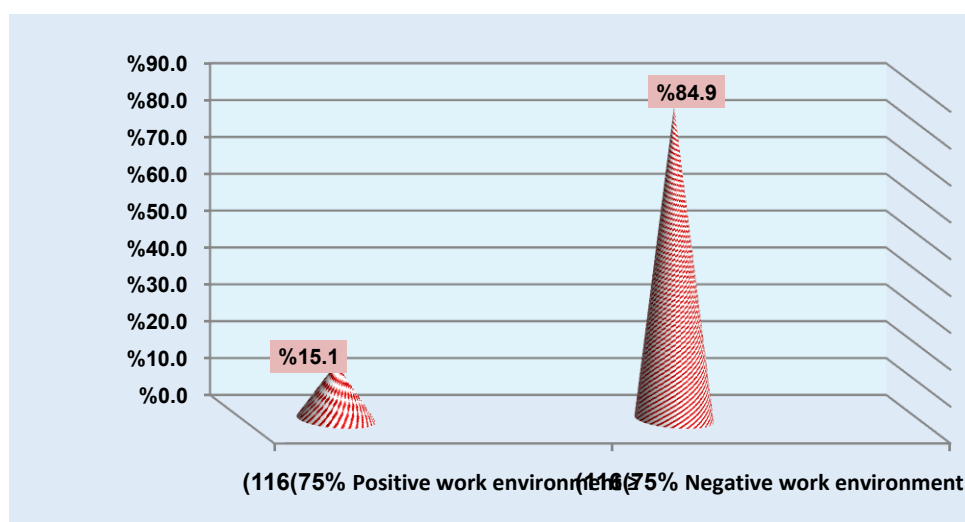


Fig. (2) Overall nurses' perception regarding their work environment (n = 345)

Figure (2) illustrates the overall nurses' perception regarding their work environment. It was obvious that, 84.9% of nurses had a negative perception regarding their work environment.

Table (3) Mean scores of the patient safety culture among the studied nurses (n = 345).

patient safety	Maximum score	Mean	SD	t-test	P-value
- Overall perception of safety	20	11.30	3.02	69.362	0.000**
- Frequency of incidents reported	15	9.44	3.96	44.237	0.000**
- Supervisor/manager expectations and actions promoting patient safety	20	9.54	4.75	37.247	0.000**
- Organizational learning and continuous improvement	15	8.69	4.31	37.419	0.000**
- Teamwork within units	20	11.66	5.55	38.996	0.000**
- Communication openness	15	7.44	3.71	37.277	0.000**
- Feedback and communications about error	15	8.45	3.72	42.217	0.000**
- Non-punitive response to error	15	10.08	4.98	37.600	0.000**
- Staffing	20	9.85	4.20	43.544	0.000**
- Hospital management support for patient safety	15	8.54	3.29	48.228	0.000**
- Teamwork between units	20	11.77	3.29	66.336	0.000**
- Hospital handoffs and transitions	20	9.80	4.53	40.179	0.000**
- Total	210	116.61	43.20	50.129	0.000**

t-test = One sample t test, **A highly statistical significant difference (P ≤ .001)

Table (3) clarifies the mean scores of the patient safety culture among the studied nurses. The mean scores of nurses' perception regarding patient safety culture subscale were (11.30±3.02, 9.44±3.96, 9.54±4.75, 8.69±4.31, 11.66±5.55 and 7.44±3.7) related to overall perception of safety, frequency of incidents reported, supervisor/manager expectations and actions promoting patient safety, organizational learning and continuous improvement, teamwork within units, and communication openness respectively. Meanwhile, the mean scores related to feedback and communications about error, non-punitive response to error, staffing, hospital management support for patient safety, teamwork between units, and hospital handoffs and transitions were (8.45±3.72, 10.08±4.98, 9.85±4.20, 8.54±3.29, 11.77±3.29, and 9.80±4.53), respectively. Moreover, the total patient safety culture perception mean score was (116.61±43.20), with a statistical significant differences between the studied nurses regarding all items related to patient safety culture perception.

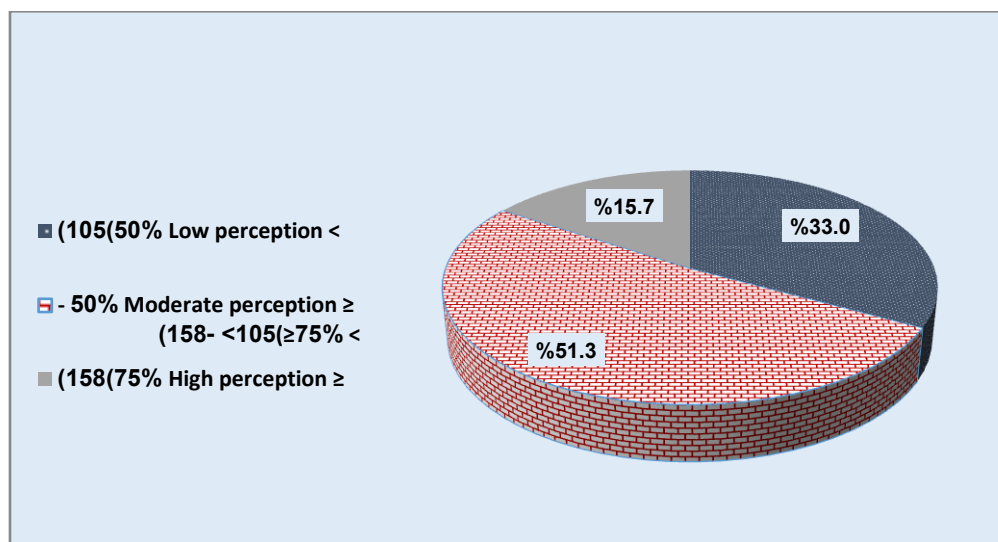


Fig. (3) Overall nurses' perception regarding patient safety culture (n = 345)

Figure (3) clarifies the overall nurses' perception regarding patient safety culture. It was clear that, 51.3% of nurses had a moderate perception regarding patient safety culture.

Table (4): the relationship between the nurses' perception regarding their work environment and their perception regarding patient safety culture (n = 345).

Nurses' perception regarding patient safety culture	Nurses' perception regarding their work environment				FET		P- value
	Negative work environment		Positive work environment		Total		
	No	%	No	%	No	%	
- Low perception	112	98.2	2	1.8	114	33.0	185.232 0.000**
- Moderate perception	173	97.7	4	2.3	177	51.3	
- High perception	8	14.8	46	85.2	54	15.7	
Total	293	84.9	52	15.1	345	100.0	

FET = Fisher's exact test, **A highly statistical significant difference (P ≤ .001)

Table (4) displays that, there was highly statistically significant relation (P= 0.000) between the nurses' perception regarding their work environment and their perception regarding patient safety culture.

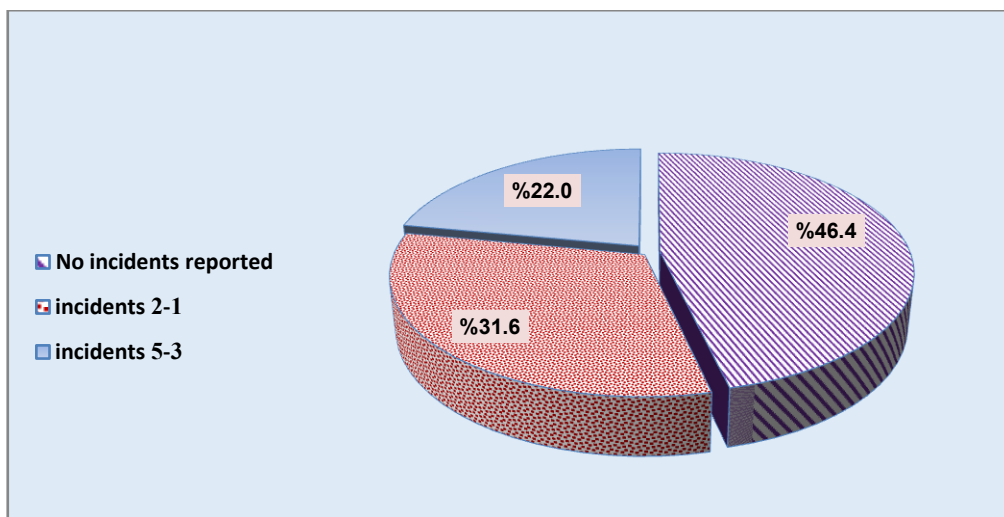


Fig. (4) Frequency of incidents reported during the last month among the studied nurses (n = 345).

Figure (4) demonstrates the frequency of incidents reported during the last month. It was found that 46.4% of nurses did not report any incidents during the last month.

IV. Discussion

Work environment refers to the perception workers have regarding elements of the organization [4]. Nurses need a work environment that permits and sustains the full expression of their skills and knowledge to achieve excellence in nursing practice [33]. Hence, assessing an organization's current patient safety culture provides a significant value to improving patient safety [29]. Our study aimed to determine work environment perception as a predictor of patient safety culture among nurses at Al-Ahrar Teaching Hospital. *The objectives were to:*

- Assess the nurses' perception of the work environment at Al-Ahrar Teaching Hospital.
- Examine patient safety culture among nurses at Al-Ahrar Teaching Hospital.
- Explore the relationships between nurses' perception regarding work environment and patient safety culture at Al-Ahrar Teaching Hospital.

Regarding to demographic characteristics of the studied nurses, our finding revealed that the majority of them were females. In general this result indicated that nursing still be more attractive for female more than male. This result consistent with finding described in another study conducted in Thailand to investigate how work environment affects job dissatisfaction, burnout, and intention to leave among nurses [34] in which, almost all participants were female. Moreover, our finding revealed that the majority of the studied nurses had direct patients contact, this finding reflected the importance of their roles in providing health care to the patient, these finding also revealed that about half of them (49.9%) had nursing diploma. Educational background is a significant predictor of the provided care and has a positive impact on patient safety outcomes [35, 1]. This reflected to the need for teaching and educational courses for the studied nurses.

Regarding the work environment perception among the studied nurses. There are statistical significant differences between the studied nurses regarding all items related to their work environment perception. However, the nurses participating at this study had a highest mean score for the nursing foundations for quality of care. This finding indicated that the quality of care issue at Al Ahrar teaching hospital presented the higher priority of the hospital management. This may be due to evolution of quality at different fields, especially health field. Our results consistent with finding described in another study conducted in Thailand to investigate how work environment affects job dissatisfaction, burnout, and intention to leave among nurses [34]. Furthermore, the finding revealed a lowest mean score was collegial nurse-physician relations. This may be described as there was in adequate support, responsibility, autonomy, and opportunities for nurses during team tasks [36]. However, physicians' occasional lack of respect for nurses reduced nurse satisfaction with physician interactions [37]. This reflected a need for in-service training about collaborative teams and conflict management for both studied nurses and physicians [34]. Our finding consistent with finding described in another study conducted in Western Kenya to assess nurse's perception of their work environment at a referral hospital [3] which found poor working relationship between nurses and physicians. Our finding is consistent with finding described in the previous mentioned study conducted in Thailand [34] in which there was a strong collegial nurse-physician relation. The finding also is consistent with another study conducted in Philippines to explore the relationship among nurses'

work practice environment, organizational commitment, and work engagement[14] which revealed that the degree of nurse-physician relationship is relatively high.

Our findings revealed the overall nurses' perception regarding their work environment was obvious that, the majority of studied nurses had a negative perception regarding their work environment. This may reflected developed a job dissatisfaction, burnout and intention to leave between the studied nurses. Respectively, different studies founded that better work environments were correlated with lower rates of job dissatisfaction, burnout and intention to leave. Conversely, supported previous international studies linking negative work environments with job dissatisfaction[38,39,40], intent to leave [41]and burnout [39,40], nurse attrition and turnover[34]. Moreover, health care settings with consistently positive work environments had lower nurse burnout and turnover rates, and that nurses had less intention to leave their current job and were likely to be less dissatisfied with their jobs [1,42].Therefore hospital administrators should increase their investment in the nurse work environment, which will benefit both the patients and hospitals [43]by fostering collaborative nurse-physician relationships, modifying the staffing and resource adequacy of nurses and further involving nurses in administrative management and decision-making[44]. These results agreed with a onestudy conducted at, Shebin El-Kom, Egypt [45]which revealed that the majority of the studied nurses 86.8% had a negative perception regarding their work environment. Our finding in consistent with finding described in the previous mentioned study [14] which founded that ED nurses perceived the ED as a positive work practice environment.

Concerningthe patient safety culture. The study finding revealed that there is a statistical significant difference between the studied nurses regarding all items related to patient safety perception. It may be related to inadequate staffing and resources needed to improve quality of care and patient safety. On the other hand, the current study revealed that more than half ofstudied nurses perceived moderate level of patient safetyin spite of their negative perception of work environment reported by nurses in this study. This may be due to the believing of studied nurses as healthcareproviders that patient safety is primarily a nursing responsibility [46].Meanwhile, positive work environment, managerial commitment, nurse education level and identifying reported mistakes have a positive effect on patient safety outcomes [47, 19, and 4]. In addition, [26], who reported that nurses who perceived more supervisor/manager expectations, more feedback and communications about error, more teamwork across hospital units, and more hospital handoffs and transitions had more overall perception of patient safety. These results in consist with the previous study [45, 48] which revealed that more than half of nurses perceived low level of patient safety.

Furthermore, the current study results revealed that there was highly statistically significant relation between the nurses' perception regarding their work environment and their perception regarding patient safety culture. These results agreed with study about Patient Safety and Patient Safety Culture, which revealed that transforming the Work Environment of Nurses, which recognized the value of nurses and the environments in which they provide care, and discussed how to design nurses' work environments to enable them to provide safer patient care. Additionally,these results agreed with study in British Columbia about the role of health care work environments in shaping a safety culture, which revealed that the relationships between work environment factors and safety culture scale also report having a healthier and safer work environment. They also are more committed to their employer, take greater pride in their work and are more satisfied with and engaged in their jobs compared with co-workers with low safety culture scale scores [49]. Our finding also agreed with a study conducted in a developing country (Turkey) about the work environment and empowerment as predictors of patient safety culture, [32] which revealed that the work environment and structural empowerment were related to the patient safety culture. Our study also consisted with [25] who reported that nurses' attitude toward the patient safety culture are often framed as results of all other contributory features of the working environment. Thus , the hospital management needs to improve the working environment for nurses to prevent the worsened working condition in a top priority[50].At the same time, developing and implementing effective strategies to promote patient safety culture is needed[51].Conversely, Patient safety culture also creates a positive environment in which patient safety is likely to occur[52]. One other hand, [53] concluded thatmanagers should ensure a flexible practice environment with adequate staffing and resources in order to improve quality of care and patient safety.Meanwhile, nurses complied with the safetyrequirements in a supportive and collaborative environment [19].At the same time,nurses' attitudes toward patient safety are often framed as a result of all other contributory features of the working environment [54]

V. Conclusion & Recommendations

The current study concludedthat the studied nurses perceive negative work environment, moderate patient safety culture,the work environment and structural empowerment were related to the patient safety culture. Improving the patient safety culture among the studied nurses may be achieved through an enhancement their work environment perception.

In light of the findings, the following actions can be recommended: improving the nursing practice environment using several measures, including: fostering collaborative nurse-physician relationships, modifying the staffing and resource adequacy of nurses. In-service training program about nurse practice environment and patient safety for studied nurses should be conducted. Develop and implement effective strategies to promote patient safety culture. Further study should be conducted based on more randomized sampling process to ensure generalizability of the results.

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