

## **Nursing Professional Practice Environment and its Influence on Safety Climate during Covid 19 Variants**

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### **Abstract**

**Background:** Safety climate is the requirement of the current changeable and very stressful environment, requiring quick decision-making and action. **Aims:** The study aimed to investigate the nursing professional practice environment and its influence on safety climate during covid 19 variants. **Subjects and methods:** A descriptive correlational design was used of 300 staff nurses, at Ain Shams University Hospitals. A self-administered questionnaire with Practice Environment scale, and nurses' characteristics as was

provided, as well as a section for safety attitudes questionnaire to measure safety climate was used to collect data. **Results.** The current study results showed statistically significant correlation between overall score of professional nursing practice environment and overall score of safety climate among staff nurses ( $P < 0.05$  and  $P < 0.05$ , respectively). Regarding safety climate dimensions, perception quality of team work dimension (34.24), and safety climate dimension (22.83) were highest mean score. while, professional nurse practice

environments were regarding nurse manager ability, leadership, and support of nurses (20.25), and nursing foundations for quality of care (19.45). **Conclusion and recommendations:** The study concluded that environments favorable to these professionals' nursing practice result in perceived a better staff nurses attitudes favorable to safety climate. The present study can be used as a reference. The study recommends that hospital management and staff nurses should foster to develop strategy to improve nurse practice environment to response effectively during crisis and maintain safety climate.

**Keywords:** Nursing professional practice Environment, safety climate, staff nurses and covid 19 variants.

#### \* Introduction

Nowadays, Health care face challenges and complexity due to the of patients' illnesses, covid 19 pandemic variants, so requiring trained professionals with mastering knowledge, practice. The COVID-19 pandemic brought challenging times for nurses worldwide. Nursing is one of the professions that is a part of the group of workers who promote care for these patients, exerting an important

influence on the results to be achieved (SANTOS et al, 2021)

Practice work environments may be challenge of promoting quality care with a low number of workers, limited professional qualification, excessive number of patients, lack of material resources and inefficient management (Gasparino et al ,2021; Dorigan and Guirardello,2017). Therefore, the practice work environment is considered as an essential factor and can be defined by the characteristics of the workplace that make it facilitate or hinder the provision of care, work organization and quality of care. The positive characteristics of the work environment that make it easier tend to promote a work environment with greater involvement of professionals, and greater satisfaction, and may affect safety climate (Gea-Caballero et al, 2021).

Safety climate measurements can be used to proactively assess an organization's effectiveness in identifying and remediating work-related hazards, thereby reducing or preventing work-related ill health and injury. This review paper focuses on construction-specific articles that developed and/or measured safety

climate, assessed safety climate's relationship with other safety and health performance indicators, and/or used safety climate measures to evaluate interventions targeting one or more indicators of safety climate. (*Schwatka et al., 2021*).

A safety climate refers to the perceived value that is given to safety considerations within an organization. It is a holistic term that includes corporate policies, management attitudes, and worker beliefs about safety within the workplace. The concept of safety climate is similar to the concept of safety culture; however, the latter term refers more specifically to the individual attitudes toward safety practice. Safety climate is often used interchangeably with safety culture, with the difference being that the former refers to the stable characteristics of the organization (Elsous et al,2017).

Safety climate measurements can be used to proactively assess an organization's effectiveness in identifying and remediating work-related hazards, thereby reducing or preventing work-related ill health and injury (Schwatka et al,2021).

A safety climate dimensions includes six Sub-dimension:

Teamwork climate is refers to perceived quality of collaboration between personnel, Safety climate is perceptions of a strong and proactive organizational commitment to safety , Job satisfaction is means positivity about the work experience, Stress recognition is acknowledgment of how performance is influenced by stressors, perception of management defined as approval of managerial action , and working condition is perceived quality of the work environment and logistical support staffing, equipment etc (Chen et al,2021: Elsous et al,2017).

Thus, they tend to develop better attitudes and behaviors toward their workplace to help in achieving its organizational goals. This would benefit workers' socio-emotional requirements as well as their subjective well being (Kurtessis et al., 2017). This is particularly apparent at times of crisis, such as the COVID-19 pandemic (Byrnes et al,2021).

#### **\* Significance of the research**

In recent years practice work environments must be constantly assessed to serve as guarantee its consistency with the Health Sector Transformation Program, which was launched to meet the requirements and

achieve the objectives of Vision 2030 and sustainability. The positive characteristics of the work environment that make it easier tend to promote a work environment with greater involvement of professionals, and greater satisfaction and may affect safety climate (Gea-Caballero et al., 2018).

Beside Canadian nurses demonstrated the importance of the work environment in mitigating the effect of such stressors, and recommended that hospital leadership provides a more adequate work climate (Buckley et al., 2021). Moreover, a limited studies in Egypt studied the safety climate and professional work environment as a characteristic that may facilitate or hinder to achieve safe quality care. Therefore, the study aims to investigating nursing professional work environment and its influence on safety climate during covid 19 variant.

**\* Aim of the study**

This study aims to investigating nursing professional work environment and its influence on safety climate Through:-

- 1- Assessing nursing professional work environment
- 2- Assessing safety climate as

perceived by nurses

- 3- Investigating nursing professional work environment and its influence on safety climate

**\* Research Question**

What is the influence of nursing professional work environment and its influence on safety climate?

**\* Subject and Methods**

**Research design:** This study employed a cross-sectional descriptive correlational technique in which all dependent and independent variables were measured concurrently to determine their associations.

**Study setting:** The research was carried out across all departments and critical care units at Ain Shams University Hospitals.

**Participants:** the study sample includes 300 nurses working in the abovementioned settings constituted the Sampling population have exclusion criteria includes nurses who their experience less than 6 months. The sample size required to estimate a correlation coefficient of  $r = 0.3$  or greater among at 95 percent confidence and 80 percent power was computed. The required sample size was determined using UCSF software calculations to be 300, account for an anticipated nonresponse rate of about

10% (Chow et al., 2008). A stratified proportionate sampling technique was utilized in recruiting nurses at Ain Shams University hospital.

**Data collection tools:** Data for this study was collected using the following two tools.

**Practice Environment scale,** and creativity was provided, as well as a section for participant characteristics.

**Nurses' characteristics:** This section was for the participant's personal data such as age, nursing qualification, marital status, residence, income, experience years, and attendance of related training courses.

**\* Practice Environment Scale(PES)**

This scale, developed by Gasparino and Guirardello (2017). Based on Lake (2002).Brazilian version The PES is a tool that aims to analyze the presence of characteristics that are favorable for professional nursing practice, included 31 items categorized into five subscales as follows: (1) nurse participation in hospital affairs (nine items); (2) nursing foundations for quality of care (10 items); (3) nurse manager ability, leadership, and support of nurses (five items); (4) staffing and resource adequacy (four items); and (5)

collegial nurse-physician relations (three items).

**\* Scoring system**

It was measured using a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree) to indicate whether the feature is present in the current work setting. The subscale score is the average of the subscale item responses. Values of 2.50 or greater imply a general agreement, whereas values less than 2.50 imply disagreement regarding the presence of the characteristics measured by the scales. NPE is classified into three categories based on the subscales' weighted mean: favorable, mixed, and unfavorable; practice environments are considered favorable if four or five subscales are above 2.50, mixed if two or three subscales are above 2.50, and unfavorable if zero to one.

**\* Safety Attitudes Questionnaire**

Short Form developed by **researcher from** (Elsous,2017; Sexton et al, 2006 ) to evaluate how professionals perceive patient safety issues. The instrument has 32 items that attempt to measure perceptions of safety climate through six domains: teamwork climate, job satisfaction, perception of the management unit and

the hospital, working conditions and stress recognition.

Each item on the questionnaire is rated on a 5-point Likert-scale (1 = strongly disagree, 2 = slightly disagree, 3 = neutral, 4 = slightly agree, and 5 = agree). Not applicable responses are scored as 0 points. Totally responses to the questions in each domain are added up and divided by the number of questions in each area. The final score of the instrument ranges from 0 to 100, where zero represents the worst and 100 the best perception of the safety climate. Values are considered positive when the total score is  $\geq 75$  equal to or higher than 75.

#### \* Tool validity and reliability

The two tools used to collect data had been shown to be valid and reliable developed by Sexton (2006). The three scales were translated into Arabic using the translate- back-translate process to guarantee their validity. A self-administered questionnaire and scale were provided to five specialists, in nursing administration departments at Ain Shams University's Faculty of Nursing, to assess its relevance and intelligibility. Based on their feedback, the questionnaire needs minor

changes. The reliability of the two tools were evaluated using the internal consistency approach. Cronbach's  $\alpha$  values of the sub-dimensions of PES ranged from 0.76 to 0.87, indicating the scale's high internal.

**Ethical considerations:** The researchers made it clear to nurse managers that participation was entirely voluntary, and that anonymity was guaranteed. They verbally agreed to take part in the study after being told they could withdraw at any moment and that the information would only be used for research. consistency and reliability. Cronbach's alpha values for of 0.89 for overall Safety Attitudes Questionnaire .

**Administrative design:** The directors of the hospital under research received official letters from the nursing faculty at Ain Shams University requesting their permission to collect data. They took a copy of the data collection form and the purpose of the study. The researchers met with the medical and nursing directors of each institution to obtain permission to conduct the study and to schedule data collection.

**Statistical analysis:** While averages, standard deviations, and medians were employed for quantitative data, frequencies, percentages, and other

descriptive statistics were used for qualitative data. Analytical statistics included Spearman's rank correlation analyses for the relations among the variables used and with nurse managers' quantitative and ranked variables. The scores for Practice Environment Scale (PES), and safety climate were subjected to multiple linear regression analysis to determine the independent factors. To evaluate the influence of practice work environment and safety climate, a hierarchical regression model containing an interaction variable was used. The statistical significance level was set at  $< 0.05$ , SPSS 25.0 statistical software was used for all analyses.

**Pilot study:** Prior to fieldwork, pilot research was conducted with ten nurse managers, representing approximately 10 % of the study sample, to assess the feasibility and practicability of the study as well as the clarity of the data collection form. It was also used to estimate the time needed by each nurse manager to fill the form, and this was found to range between 15-20 minutes. The researchers undertook some necessary adjustments on the tools and procedure of data collection on the basis of the pilot results. The pilot study group did not include the nurse

managers who participated in the pilot research.

**Field work:** After gaining official permission to perform the study, the data collection process began. The researchers met with the nurse individually and invited them to join the study after fully explaining the study's purpose, procedures, and rights. Those who consented to participate were given a self-administered questionnaire and detailed instructions on how to complete it. The researchers were always on hand to answer any questions. The filled forms were then collected and revised for completion. The fieldwork was done two times a week during the morning and afternoon shift. The data gathering period lasted approximately four months, commencing in early June 2021, and ending in October 2021.

#### \* Results

**Table (1):** The study involved 300 nurses with median age  $29 \pm 456$  years, mostly females (71.6%) with bachelor's degree (80.7%) as presented in Table 1. Approximately more than two-thirds were married (73.3. %), Their median total and current job. Experience was 5-10 and less than 5.0 years respectively. Also,

a very few of them reported having attended training course regarding safety climate or nurse work environment.

**Table (2):** Demonstrates that highest mean score of safety climate was regarding perception of team work climate dimension (34.24), and safety climate dimension (22.83). While the lowest mean score were respectively regarding stress recognition and perception of management dimensions (15.54), (16.45). Overall perceptions of safety climate dimensions were (20.61).

**Table (3):** Professional nursing practice environment subscale score were more favorable regarding nurse manger ability, leadership, and support of Nurses , (20.25). Nursing foundations for quality of care and Collegial nurse physician relationships (19.45, 16.45) respectively. While, the lowest mean score was regarding staffing and resources adequacy (2. 8).

**Table (4):** Spearman's correlation between the professional nursing Practice environment and the safety climate verified that all subscales were correlated and had statistically significant except for working condition and stress recognition were only positive correlated with

participation in hospital affairs and statistically significant with all subscales. In this essence, highly correlated were regarding most of the dimensions. As relationship between nurses and physicians and working condition( 0.65\*). Manager ability with safety climate and perception of management (0.65\*). Moreover, Participation in hospital affairs and resource adequacy with perception of management ( 0.65\*).

**Table (5):** In matrix correlation of professional nursing practice environment and the safety climate among staff nurses indicates that there was statistically significant positive correlation between of nursing practice environment and the safety climate ( $r=0.059^*$ ).

**Table (1): Nurse characteristics in the study sample (n=300)**

	Frequency	Percent
Age:		
<40	220	73.3
40+	80	26.7
Range	88	
Mean±SD	59< -21	
Median	29 ±456	
Gender:		
Male	12	28.4
Female	288	71.6
Nursing qualification:		
Diploma	200	66.6
Bachelor	71	23.7
Technical institute	29	9.9
Marital status:		
Unmarried (single/divorced/widow)	80	26.7
Married	220	73.3
Experience years		
<5	60	20.0
5-10	198	66.0
10+	42	14
Range	1-31	
Attended courses in:		
Safety climate	15	5.0
Nursing professional work environment	6	2.0

**Table (2): Descriptive analysis of the Safety Climate among staff nurses(n=300)**

Safety Climate Dimensions	Mean	SD
<b>Overall perceptions of safety climate.</b>	20.61	±1.16
▪ Perception of team work climate	34.24	±0.87
▪ Safety climate	22.83	±0.86
▪ Job satisfaction	19.45	±0.55
▪ Working condition	20.66	±0.54
▪ Stress recognition	15.54	±0.91
▪ Perception of management	16.45	±0.75

**Table (3): Overall scores of the professional nursing practice environment among staff nurses(n=300)**

Practice work Environment Domain	Mean	SD
<b>Overall score of Practice Work Environment.</b>	2.4	±0.78
▪ Nurse participation in hospital affairs	2.90	±0.86
▪ Nursing foundations for quality of care	19.45	±0.55
▪ Nurse manger ability, leadership, and support of Nurses	20.25	±0.76
▪ Staffing and resource adequacy	2.86	0.77
▪ Collegial nurse physician relationships	16.45	±0.75

**Table (4): Spearman's correlation between subscales of the Practice environment scale and the safety climate dimensions.**

Subscales of the PES	Spearman's rank correlation coefficient					
	Perception team work climate	Safety climate	Job satisfaction	Working condition	Stress recognition	Perception of management
▪ Participation in hospital affairs	0.29*	0.59*	0.49*	34.8	33.4	0.65*
▪ Foundations for quality	0.51*	0.60*	0.43*	0.65*	0.47*	0.51*
▪ Manager ability	0.40*	0.65*	0.51*	0.65*	0.29*	0.65*
▪ Staff and Resource adequacy	0.35*	0.44*	0.47*	0.60*	0.44*	0.65*
▪ Collegial nurse-physician relations	0.51*	0.44*	0.44*	0.65*	0.51*	0.51*

at  $p < 0.05(*)$  Statistically significant  
 at  $p < 0.01(**)$  Statistically significant

**Table (5): Correlation matrix of total scores of Practice environment scale and the safety climate among nurses (n=300)**

		safety climate among nurses	total score of professional nursing practice environment
Overall score of professional nursing practice environment	R	0.059*	-
	P-value	0.059*	-
Overall score safety climate among nurses	R	-	0.059*
	P-value	-	0.059

\* significant result Discussion:

The work environment of

healthcare professionals is important for maintaining good patient care and is receiving increasing attention in scientific research. A favorable work environment is vital to perceived and understood for health care providers to gain objective insights into the work environment (Maassen et al ,2021). Moreover, a positive work environment is strongly associated with attracting and retaining healthcare professionals (Rugulies, 2019), which is crucial in times of healthcare staff shortages, especially during the COVID-19 pandemic.

The safety climate construct has attracted the attention of many organizations. Safety climate may be a useful leading indicator of construction safety and health performance. When the nurses perceive their organization emphasizes safety behaviors, they are less likely to miss or omit nursing care activities. This encourages nurses to be fully motivated, highly engaged and committed to their work, as well as proactive in the care of their patients (Leodoro. and Labrague ,2021; Lake etal.,2020;Zhao et al.,2020).

Regarding professional nursing practice environment subscale score finding of the current study revealed

that all subscales of nursing practice environment were favorable, but the most favorable, and better the perception of the staff nurse were regarding to nurse manger ability, leadership, and support of nurses , this may return because the time of covid 19 variants the nurse managers were direct contact and available all the time to support and guide nurses. Also, nursing foundations for quality of care was the subsequent higher mean score. This study in congruence with study carried out in New Jersey by Hessels et al. (2016), who determine the relationship between the professional nursing environment and missed nursing care and found that the foundation for quality had the highest mean score of professional nursing practice environment domain.

The finding confirmed also by study carried out in four large states of California, Florida, Pennsylvavania and New Jersey by Olds et al (2018), who examined nurse work environment, safety climate and patient outcomes and found that the foundation for quality had the highest mean score of professional nursing practice environment domains.

Furthermore, collegial nurse physician relationships dimension was

better perceived by staff nurses. This result was in agreement with (Leodoro and Labrague ,2021), who reported that, collegial nurse–physician relations was the dimension of the PES-NWI that obtained the highest mean score. This may be due to nurse and physician working together with mutual respect and trust for to provide patient care, benefit of the patient. In the same line, professionals who perceived greater good relationships with the medical team and better control over the work environment can result in positive perception of the safety attitudes(Guirardello,2017).

Meanwhile, the lowest mean score was regarding staff and resource adequacy dimension. Although it is the lowest score but still favorable. This may be due to increase number of admitted patient during the epidemic period who needed more staff and resources. This is congruence with, Dorigan and Guirardello, (2017),who indicated that the adequacy of the material resources and the number of nursing professionals for care, slightly above-average scores.

Nurses’ favorable practice environment had crucial role in the optimal achievement of positive patient outcomes, lower mortality

rates, fewer patient falls, fewer complications and healthcare-related infections and higher quality care (Al Sabei et al., 2020). Additionally, study in Philippines concluded that a favorable nurse practice environment significantly reduced job burnout and job stress eventually may engage a better nurse workforce in the country and subsequently reduce migration and improved the quality of patient care. Managers must focus on developing good nurse practice environments that will improve professional work outcomes and quality patient care (Falguera, et al., 2020).

Concerning safety climate, staff nurses perceived that teamwork climate dimension was the highest mean score. This finding agreed with study conducted in Australian and Sweden, concluded that nursing and medical staff perceived the teamwork climate more positive and noted that teamwork is thought to affect staff safety climate, which in eventually turn impacts patient safety. In the same issue, team work is complex and represents an important strategy to overcome difficulties in situations that require rapid actions by members in which there is coordination and understanding of the role of each one,

ensuring the quality and safety of the care provided, especially in unexpected situations and emergencies (Dunstan and Coyer, 2020).

Spearman's correlation between the professional nursing practice environment and the safety climate verified that staff nurses at all dimensions were correlated and had statistically significant with all safety climate subscales except for working condition and stress recognition were only positive correlated with participation in hospital affairs dimension. In this essence, highly correlated were regarding most of the dimensions. As relationship between nurses and physicians and working condition, manager ability with safety climate and perception of management. Moreover, participation in hospital affairs.

The current finding is in agreement with an international study indicated that, correlation was verified a moderate and significant correlation with the subscale's autonomy, relation between physician and nursing team, personal accomplishment and with the domains: teamwork climate, safety climate, job satisfaction and safe behavior (Guirardello, 2017)

In matrix correlation of

professional nursing practice environment and the safety climate among staff nurses indicated that there was statistically significant positive correlation between of nursing practice environment and the safety climate. **In congruence with the current study, an international study indicated that, correlation** was verified statistically significant between the perceived assessment of the nursing practice environment, job satisfaction and safety climate (Dorigan and Guirardello, 2017).

#### **\* Conclusion and Recommendations**

Professional practice environment are key factors influencing safety climate. Study concluded that favorable professional nursing practice nursing environment were strongly associated with perception safety climate.

#### **\* The study recommended**

- 1- The nurse manager should measure nurses' perceptions toward the practice environment in different units yearly.
- 2- Nursing managers should conduct the conference with the staff nurses for discussion and increase awareness about professional nursing practice environment characteristics, and safety climate and how to react to it for the effective work environment.

3- plan strategy to Providing hospitals with adequate number of professionals for care, staffing and resource .

4- Further studies is recommended to assess and maintain a favorable nursing practice working environment.

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