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The Relationship Between The Safety Of Patients In Intensive Care Units And The Factors Influencing The Quality Of Nursing Handover Among Staff Nurses

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Abstract

Background: *Handover involves the transfer of health care providers' responsibility and accountability for some or all aspects of care for a patient, or groups of patients, to another clinician or nurse on a temporary or permanent basis with communication being a major factor for the transfers. Effective handover is essential for safe health care and should use in all clinical situations. Intensive Care Unit (ICU) staff nurses role includes maintaining the continuity of patients care around the clock. High-quality nursing handover helps them to accomplish their role efficiently.* ***The study aimed****: To assess factors affecting quality of nursing handover among staff nurses and its relation to patients' safety in ICUs.* ***Method:*** *A descriptive correlational study design was used to achiev[1]e the aim of the present study. The study was conducted at Hospital (ICUs) in Makkeh, KSA. 255 staff nurses were involved in the study. Two tools were used to collect the data.* ***Tool I:*** *Factors Affecting Quality of Nursing Handover in ICUs Questionnaire.* ***Tool II****: Patients' Safety Issues in ICUs Questionnaire.* ***Results:*** *ICU staff nurses' highest mean percent of factors affecting nursing handover process quality were regarding relations with outgoing nurse 86.7, last handover experience 80.6 and unit safety climate 71.2. According to total ICU staff nurses' perceptions about patients' safety, 51.8% perceived a fair level in their work environment. 53.8% of staff nurses perceived a good level of patients' safety issues in their supervisors' expectations and actions promoting safety.* ***Conclusion:*** *There was a positive correlation between total factors affecting quality of nursing handover process and patients' safety issues in ICUs.* ***Recommendations:*** *Hospital management need to conduct continuous updating of handover policies and strategies to ensure its efficiency to keep patients' safety. Also, ICU staff nurses require allocating enough time every shift for the handover process.*

Keywords*: Intensive Care Units, Nursing handover, Patients' safety, Quality of nursing handover, Staff nurses.*

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Introduction

Patients in intensive and critical care are severely ill and require support for vital functions. These patients are often sedated and their communication impaired, meaning patients can be vulnerable because of their inability to protect their integrity and autonomy [1]. Intensive and critical care nurses strive to protect patients' integrity and autonomy while providing care for their medical concerns [2]. Patients are transferred to critical care units from various other care settings such as the resuscitation room, surgery or other wards [3]. As patients are moved into and out of critical care units (ICU), different nursing specializations must communicate with one another. Communication breakdowns are particularly frequent as a result of the obvious differences between the two situations [4]. When high-acuity patients are taken from the ED to an ICU, they may be critically ill. A seamless transition from one provider to another is necessary for continuity and quality of care to prevent negative effects [5].

Intensive care is a multidisciplinary and inter-professional specialty dedicated to the overall management of patients' needs or acute and life-threatening organ dysfunction. While the underlying disease is being treated and resolved, the primary goal of intensive care is to prevent additional physiologic deterioration [6]. Nursing care is provided around the clock in intensive care by nurses having special qualifications and specialized training. The nurse to patient ratio is higher than in other areas of the hospital [7]. ICU staff nurses role includes protection, promotion and optimization of health and abilities [8]. There is a significant nursing shortage in ICUs which has led to concerns about the adverse impact of this shortage on the quality of patients' care [9].

Maintaining the continuity of care between working shifts is one of the most important aspects of patient care in ICUs [10]. Effective nurse handover can reduce the amount of time spent searching for information [11]. Nursing handover is considered to be a communication pattern used in the daily nursing procedures, to fulfill the goals of healthcare organization, continuity, consistency and patients' safety [12]. Factors affecting quality of nursing handover in ICUs consist of five dimensions , last handover experience, work environment, relationship with the outgoing nurse, staff nurses' feelings about work in general and unit safety climate [13] Last nursing handover experience characteristics are key factors for the reinforcement of a wider understanding around main handovers points [14]. In work environment, nursing handover requires determining an area away from interruptions and maintaining patients' privacy [15].

Beneficial relationships with the outgoing nurse help nurses to make appropriate decisions about the type and amount of information provided to the incoming nurse [16]. Staff nurses' feelings about work in general include fatigue and job stress can hinder nursing handover. Positive safety climate appears in low rates of pressure ulcers as well as increased safety behaviors [17]. Lack of handover protocols jeopardizes patients' safety causing delays in care and inappropriate interventions. The hospital work unit, the supervisor expectation and action promoting safety, communication, frequency of events reported and the hospital management support for patients' safety are the five dimensions of patients' safety issues. The hospital work unit with good work environment and better professional staff nurses has more satisfied patients and staff nurses. [18]

Supervisor expectations and actions promoting safety include establishing patients' safety as strategic priority [19]. Communication among staff nurses is an essential element to the planning and evaluation of patients' care and safety. [20] Frequency of events reported include documentation of all adverse events that may or actually cause harm to the patients [21]. The hospital management support for patients' safety which manifests itself in increased hospital administration awareness and reinforcement leads to improve patients' safety [22]. The quality of nursing handover can affect patients' safety as it saves time spent searching for omitted information [23]; it can prevent nursing mistakes and reduce medication errors. [24]

Accordingly, safe treatment in a safe environment is a basic patients' right and a fundamental hospital duty. The main goal of patients' safety is to prevent physical and

psychological harm to the patients. [25] So, this study assessed the factors affecting quality of nursing handover and its relation to patients' safety issues in ICUs which hope to assure an interactive qualified handover that maintains patients' safety.

Method

A descriptive correlational study design was used to achieve the aim of the study. The study was conducted at at Hospital (ICUs) in Makkeh, KSA. The subjects of the study consisted of all (n=255) staff nurses from the previously mentioned setting as follow; Neonatal (n = 55), Medical (n=54), Pediatric (n=17), Anesthesia (n=50), Cardiac (n=60) and Burn (n=19) Intensive Care Units. **Tools of data collection**: Tool (I): Factors Affecting Quality of Nursing Handover in ICUs Questionnaire, The tool was developed by the researcher based on Thomson (2016) [13] and recent related literature [25-31]. It consisted of two parts; Part 1: Personal characteristics of staff nurses working in ICUs included age, sex, marital status, educational qualification and years of experience in nursing.

Part 2: Factors affecting quality of nursing handover in ICUs. It included 49 items under five subscales: last handover experience, work environment, relationship with the outgoing nurse, staff nurses' feeling about work in general and unit safety climate. Staff nurses responses were measured on a three points Likert Scale ranged from 3-1 where agree = 3, uncertain = 2 and disagree = 1. The total score was calculated by summing of all categories and high scored factors indicated high effect on quality of nursing handover. The scoring system was reversed for the negative items

Tool II: Patients' Safety Issues in ICUs Questionnaire. This tool was developed by the researcher based on Agency for Healthcare Research and Quality (AHRQ) (2016) [32] and recent related literature [33- 35]. It includes 56 items under five subscales: the hospital work area/unit, the supervisor expectation and action promoting safety, communication, frequency of events reported and the hospital management support for patient safety. Staff nurses responses were measured on a three points Likert Scale ranged from 3-1 where agree= 3, uncertain = 2 and disagree = 1. The scoring system was reversed for the negative. The total scores were calculated by summing of all categories and classified into levels (31): good patient safety ≥ 75%, fair patient safety 60 < 75% and poor patient safety < 60%.

An official permission to conduct the study was obtained from the responsible authorities of Hospital. Approval of the ethical committee of the University was obtained. An informed consent for participation in the study was obtained from staff nurses after explanation of nature and purpose of study. Confidentiality was put into consideration regarding the data collected. A code number was used instead of names. Subjects had the right to withdraw from the study at any time during the study. The tools were translated into Arabic and presented to a jury of five experts in the area of specialty to check content validity and clarity of questionnaire. The face validity value of Tool (I) = 93.96% and Tool (II) =97.18%.

A pilot study was done on 10% (26 nurses) of the subject. Reliability of tools was tested using Cronbach' Alpha Coefficient Factor, its value for tool I was 0.762 and for tool II was 0.821. The researcher met ICU staff nurses individually during their work shifts to distribute the questionnaires. The appropriate time for data collection was according to the type of work and workload for each unit; sometimes it was in the middle of the shift in morning, afternoon and night shifts. The time needed to complete the questionnaires was around 30 minute. The duration for collecting data was 4 months from January to April 2022.

Results

Table (1) shows personal characteristics of ICU staff nurses. The table revealed that the age of staff nurses ranged between 22 to 45 years old with mean age 27.34+2.92. Regarding educational qualification, it was noticed that less than half (47.5%) of staff nurses had Bachelor degree and 43.1% of them had Associate degree in nursing. Also, the table represented that years of experience in nursing of staff nurses working in ICUs ranged

from 1 to 21 years of experiences with mean years of experience 4.95+3.08.

Table (2) illustrates work characteristics of ICU staff nurses. The table showed that less than half (48.2%) of staff nurses had night shift in their last work shift. Also, less than quarter (23.5%, 21.5% and 21.2%) of them worked in Cardiac, Neonatal and Medical ICU respectively. Additionally, more than two thirds (69.4%) of staff nurses were mostly assigned to two patients every shift and less than half (45.5%) of them used both oral and written handover. The table indicated that less than one third (30.2%) of staff nurses had more than one source of intrusions.

Mean percent of ICU staff nurses' perception regarding factors affecting quality of nursing handover process. The highest mean percent of ICU staff nurses' perception were (86.66 and 80.64) regarding relations with outgoing nurse and last handover experience that affect quality of nursing handover process respectively. Followed by mean percent (71.18 and 68.95) regarding unit safety climate and work environment that affect the quality of nursing handover process respectively.

Levels of total ICU staff nurses' perception regarding patients' safety issues. The figure clarified that more than half (51.8%) of ICU staff nurses perceived a fair level of total patients' safety issues in their work environment. Levels of ICU staff nurses' perception regarding patients' safety issues. The figure clarified that more than half (53.8%) of ICU staff nurses had a good perception level regarding their supervisors' expectations and actions to promoting safety. Additionally, more than three quarters (79.6%) of ICU staff nurses had a fair perception level regarding hospital work area/unit.

Table (3) shows correlation between factors affecting quality of nursing handover process and patients' safety issues in ICUs. The table showed that there was significant statistical correlation between last handover experience, relations with outgoing nurse, unit safety climate and all patients' safety issues subscales at P-value ≥ 0.001 and r = 0714. Also, there was significant statistical correlation between staff nurses' feelings about work in general and hospital work unit, supervisors' expectations and actions promoting safety in addition to hospital management support for patients' safety at P-value ≥ 0.001 and r = 0714.

Table (1): Personal characteristics of ICU staff nurses (n = 255)

Personal characteristics	**ICU staff nurses**	
	No	**%**
Age in years:		
20-	212	83.1
30-	41	16.1
40-	2	0.8
Range (min-max)	22-45	
Mean ±SD	27.34±2.92	
Sex:		
Male	0	0
Female	255	100
Marital status:		
Single	52	20.4
Married	201	78.8
Widow	1	0.4
Divorced	1	0.4
Educational Qualification:		
Diploma of nursing	1	0.4
Associate degree in nursing	110	43.1
Bachelor of nursing	121	47.5
Post graduate studies	23	9.0
Years of experience in nursing:		
<5	126	49.4

Personal characteristics	ICU staff nurses	
	No	%
5-	108	42.3
10-	15	5.9
15-	5	2
20-	1	0.4
Range (min-max)	1-21	

Table (2): Work characteristics of ICU staff nurses (n = 255)

Work characteristics	ICU staff nurses	
	No	%
Last working shift:		
Morning	54	21.2
Afternoon	78	30.6
Night	123	48.2
Working unit:		
Neonatal ICU	55	21.5
Medical ICU	54	21.2
Pediatric ICU	17	6.7
Anesthesia ICU	50	19.6
Cardiac ICU	60	23.5
Burn ICU	19	7.5
No. of patients mostly assigned/shift:		
1 patient	74	29.0
2 patients	177	69.4
3 patients	4	1.6
The method of handover in the last shift:		
Oral	27	10.6
Written	111	43.5
Both oral and written	116	45.5
Mobil call	1	0.4
The source of intrusions which may happen during handover:		
Patients	3	1.2
Patients relatives	47	18.4
Alarms from devices	68	26.7
Outside noise or chatter	60	23.5
More than one source	77	30.2

Table (3): Correlation between factors affecting quality of nursing handover process and patients' safety issues in ICUs (n=255)

Patients' safety issues	Factors affecting quality of nursing handover process									
	Last handover experience		Work environment		Relations with outgoing nurse		Staff nurses' feelings about work in general		Unit safety climate	
	r	p	R	p	r	p	r	P	r	P
Hospital work area/unit	0.327	0.001*	-0.006	0.920	0.360	0.001*	0.161	0.010*	0.517	0.001*
Supervisors expectations and actions promoting safety	0.485	0.001*	-0.114	0.070	0.347	0.00*	0.155	0.013*	0.483	0.001*
Communication	0.482	0.001*	0.085	0.178	0.451	0.001*	0.099	0.113	0.552	0.001*
Frequency of reporting of events	0.433	0.001*	-0.036	0.583	0.275	0.001*	0.091	0.147	0.435	0.001*
Hospital management support for patients' safety	0.436	0.001*	0.045	0.476	0.307	0.001*	0.207	0.001*	0.546	0.001*

Discussion

Nursing handover is life-threatening for ensuring ongoing patients care as it involves essential clinical information, clinical care requirements and the transfer of care responsibility. During handover, the staff nurses can obtain immediate feedback and exchange of information; thus, problems or errors can be noticed and rectified quickly [36, 37]. Furthermore, during handover staff nurses must double-check certain information to ensure the patient's safety in their ICUs. Patients' safety is one of the components of quality that aims to improve patients care outcomes and prevent harm occurrence. [38] The present study results showed that the relations with outgoing nurse dimension was the highest factor affecting quality of the nursing handover process from ICU staff nurses' perspective. This could be due to majority of staff nurses aged from 20 to 29 years old. This age affinity creates a common understanding language that facilitated the exchange of information between them.

This result was approved by **Pezzolesi (2013)** [39] who reported that majority of staff nurses rated their outgoing nurses' relationships as being positive. Also, this result was supported by **Bost (2012)** [40] who assured that relationships within staff nurses and

communication which included a discussion of clinical information influence handover quality positively. But this study was disagreement of the findings with **Thomas (2013)** [41] who found that staff nurses who relates to each other positively take longer time to share necessary information.

The current study results clarified that more than half of ICU staff nurses perceived a fair level of total patients' safety issues in their work environment. This could be attributed to ICU staff nurse worked longer hours to give best patient care and felt that their mistakes were held against them. These results were in the same line with **Aiken (2018)** [42] and **Busse (2012)** [43] who reported that nearly half of the staff nurses described their units as providing fair patients safety and quality of care. This finding was contraindicated by **McHugh (2016)**[44] who stated that most of staff nurses perceived a poor level of patients' safety work environments which made complete involvement to evidence- based safety interventions hard.

The results of present study showed a statistically significant correlation between total factors affecting quality of nursing handover and patients' safety issues in ICUs. This can be due to comprehensive and effective handover process provides nurses with adequate information required to adequate patients care necessary to keep the patients safe. This study finding was confirmed by **Rush (2012)** [45] who found that a positively correlated between nursing handover and patients' safety. Also, according to the **Agency for Healthcare Research and Quality (AHRQ) (2016)** [32] effective patient information handover, personal responsibility at shift changes, and department accountability during patient transfers were all strongly linked to patient safety perceptions.

In addition, **Alkhaqani (2022)** [46] confirmed that good communication influenced the teamwork that resulted in a significant improvement in patients' safety culture. This finding was not supported by **Else (2013)** [47] who found that there was no statistically significant correlation between handover and patients' safety. Staff nurses' perceptions of handover were positive and indicated a lack of awareness and implementation of patients' safety procedures. The current study showed a statistically significant correlation between last handover experience, relationships with the exiting nurse, unit safety climate and all patients' safety issues. This could be because staff nurses learned from previous experiences to prevent adverse occurrences from occurring again.

This study finding was confirmed by **Zrelak (2012)** [48] which reported that there were significant statistical relation between staff nurses' handover experience level, relations between them and patients' safety. These findings were parallel with **Gravio (2016)** [49] who stated that significant relationships were found between safety climate and patients' safety performance; therefore, improvements in patient safety climate will improve the safety performance of nurses. These findings were not parallel with **Tlili (2020)** [50] who reported that all aspects of patients' safety needed to be promoted. These findings could be due to lack of knowledge and awareness of the many different domains of patients' safety culture.

Conclusion

ICU staff nurses' highest mean percent of factors affecting nursing handover process quality regarding relations with outgoing nurse, last handover experience and unit safety climate. More than half of ICU staff nurses perceived a fair level of total patients' safety issues in their work unit. More than half of ICU staff nurses' perceived a good level of patients' safety issues in their supervisors' expectations and actions promoting safety. There was a positive correlation between total factors affecting quality of nursing handover process and patients' safety issues in ICUs.

Recommendations

For hospital management: Continuous updating of handover policies and strategies to ensure its efficiency to keep patients' safety. Design and implement continuous training programs and workshops for ICU staff nurses and newly hired nurses, to equip them with

essential knowledge and skills for effective handover and patients' safety. **For ICU nurses' supervisors:** Support ICU staff nurses to select the most appropriate method of handover and follow the structured handover approach that focus on most related information. Provide ICU staff nurses with appropriate feedback about their performance. **For ICU staff nurses:** Allocate enough time every shift for the handover process. Document errors to analyze them and prevent future incidence.

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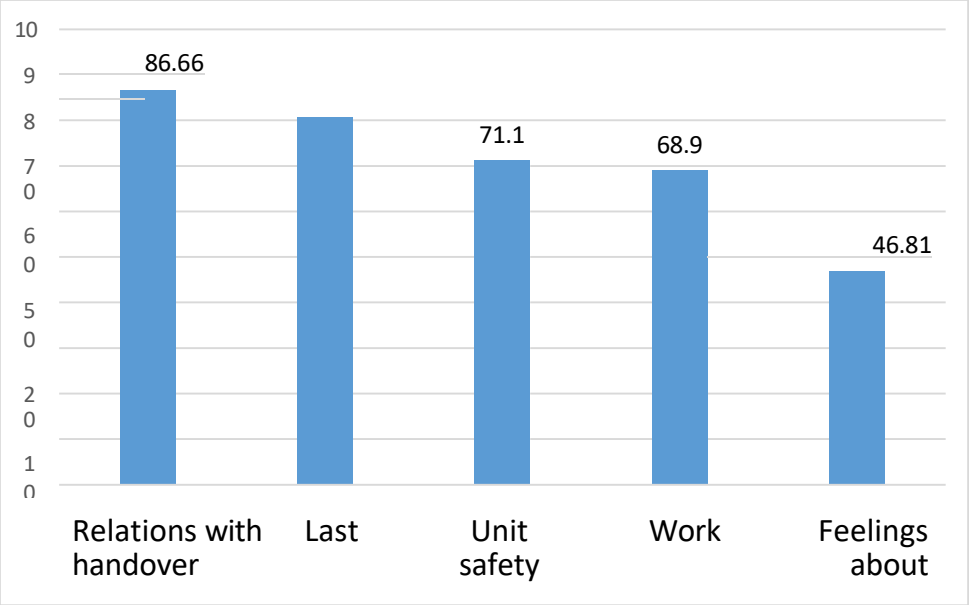

Figure (1): Mean percent of ICU staff nurses' perception regarding factors affecting quality of nursing handover process (n=255)

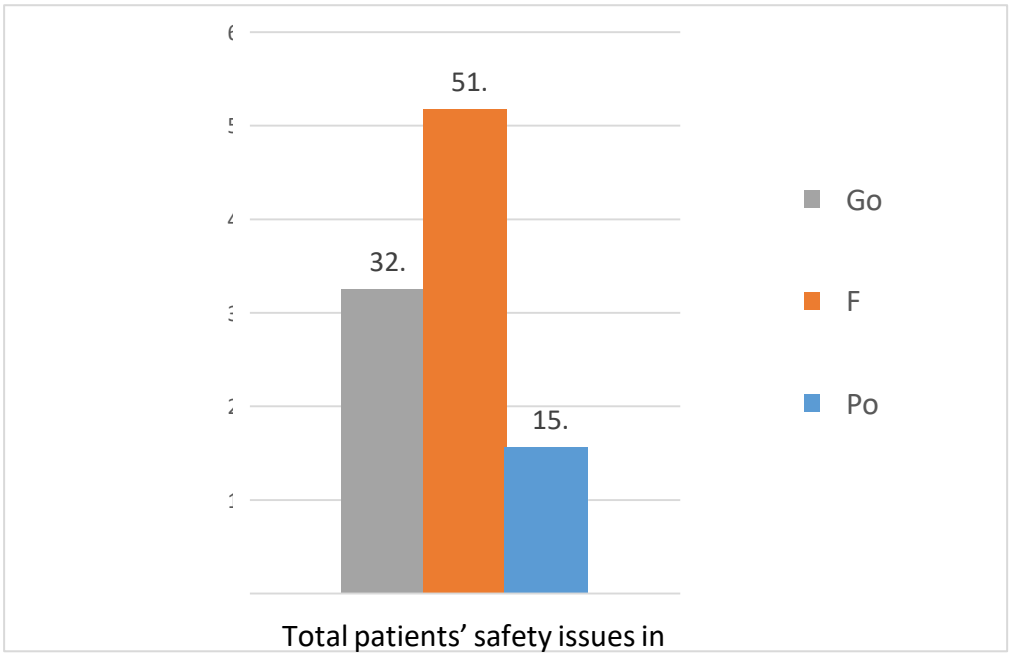

Figure (2): Levels of total ICU staff nurses' perception regarding patients' safety issues (n=255)

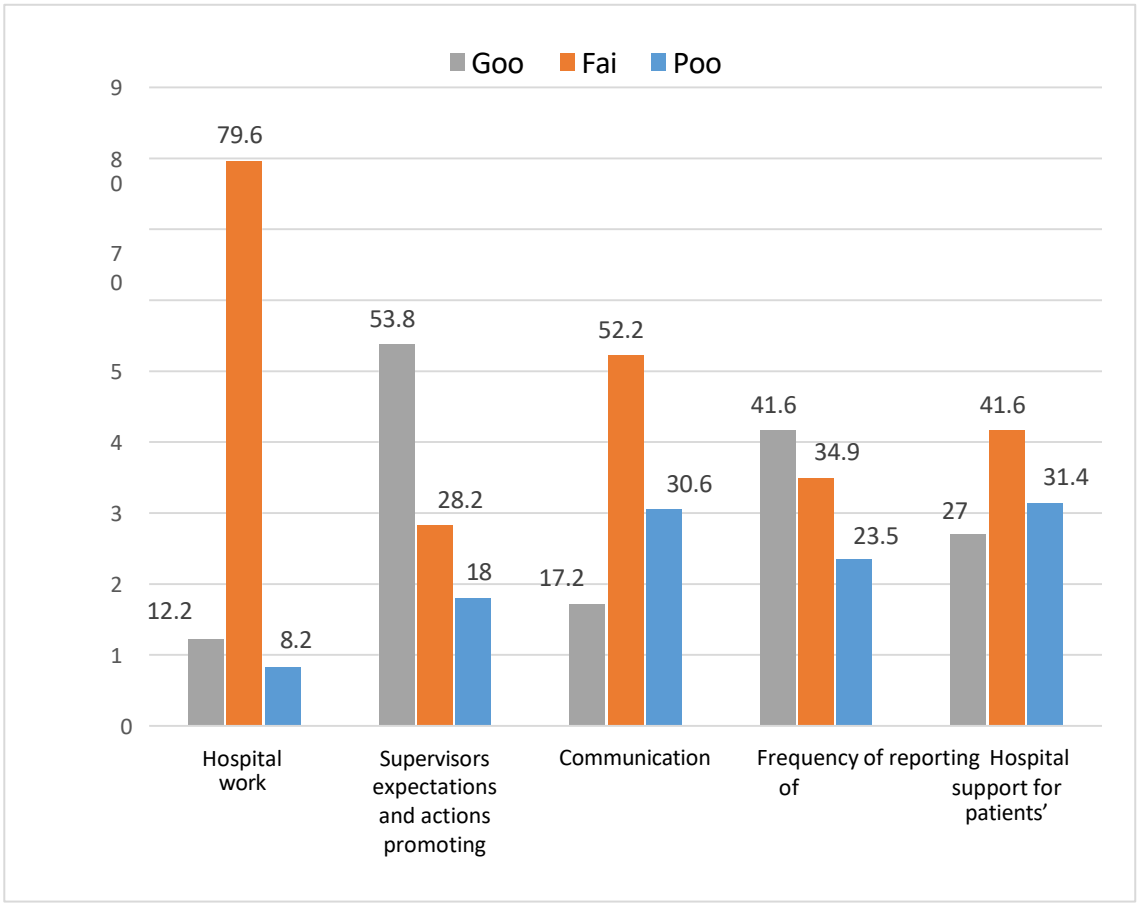

Figure (3): Levels of ICU staff nurses' perception regarding patients' safety issues (n=255)