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Assessment of Nursing Shift-to-Shift Handover in Intensive Care Unit

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Abstract

Background: Shift-to-shift handover helps the health care provider to summarize or describe patient data via communication**. Aim of the study:** to assess nursing shift-to-shift handover in the intensive care unit. **Research design**: A descriptive design was used to conduct this study. **Setting:** The study was conducted at the intensive care unit located at Beni-Suef General hospital. **Subjects:** A **c**onvenience sample of (69 nurses) was working in the previously mentioned setting. **Tools of data collection:** Two tools were used for data collection included; Nurses' shift-to-shift handover knowledge questionnaire and the nursing shift-to-shift handover observational checklist. **Results**: the study result revealed that (62.3%) of studied nurses had an unsatisfactory level of knowledge, compared to (37.7%) of them had a satisfactory level of knowledge. Furthermore, (27.5%) of nurses had a low performance, paralleled to (37.7%) of them had a moderate performance. Conversely, (34.8%) of studied nurses had a high performance. **Conclusion:** there was a highly statistically positive correlation between total level of knowledge and the total level of performance regarding shift-to-shift handover among the studied nurses at (r= 0.934 & P= 0.000). **Recommendations**: Periodic assessment for the nursing shift-to-shift handover in the intensive care unit and develop counseling office to help nurses for better handover and performance**Abstract:** Shift-to-shift handover helps the health care provider to summarize or describe patient data via communication**. Aim of the study:** to assess Nursing Shift-to-Shift Handover in Intensive Care Unit. **Research design**: A descriptive design was used to conduct this study. **Setting:** The study was conducted at Intensive Care Unit at Beni-Suef General hospital. **Subjects:** All available nurses in the previous mentioned setting. **Tools of data collection:** Two tools were used for data collection included; Nurses' shift to shift handover knowledge questionnaire sheet and Nursing shift-to- shift handover observational checklist. **Results**: More than two third of nurses (62.3%) had unsatisfactory knowledge, while more than one third of them (37.7%) had satisfactory knowledge. More than one quarter of nurses had low performance (27.5%), more than one third of them had moderate performance (37.7%). While one third of them had high performance (34.8%). **Conclusion:** there was highly statistically positive correlation between total of level of knowledge and total level of performance regarding shift-to-shift handover among the studied nurses at (r= 0.934 & P= 0.000). **Recommendations**: Periodic assessment for nursing shift-to-shift handover in intensive care unit. Develop counseling office to help nurses for better handover and performance.

Keywords: Intensive Care Unit (ICU), Nursing Staff and Shift-to-shift handover

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Introduction

Nursing is an art and science by which people are assisted in learning to care for themselves whenever possible and cared for by others when they are, unable to meet their own needs. Nurses coordinate care and apply their knowledge and skills to deliver care. Breakdown of communication between, nurses can interfere with the client's treatment. Communication in nursing is a journey to a destination of clear meaning. Nurses travel this road to help patients, and families heal and promote health and wholeness. Communication is at the heart of nursing and is essential in conveying caring and applying nursing skills and knowledge **(Mori & Shima, 2020).**

On a daily basis, in every "healthcare facility, the responsibility for the care of patients is transferred between care providers. This process may be inactive and interruptive environments that are typical of those in healthcare today. The communication of patient information to the next care provider can be known as "report," "end-of-shift report," "handoff," or "handover." This communicates the information necessary for patient care to continue as planned; and for the purpose of this project, the term "handover" will be used. Three primary things are transferred during every handover: information, authority, and responsibility **(Bressan et al., 2019).**

Hand-over communication relates to the process of passing patient-specific information from one caregiver to another, from one team of caregivers to the next, or from caregivers to the patient and family for the purpose of ensuring patient care continuity and safety **(Forde et al., 2020).**

Handover is a frequent and complex task that also implies the transfer of the responsibility of the care. The deficiencies in this process are associated with important gaps in clinical safety also inpatient and professional dissatisfaction, as well as increasing health costs. Efforts to standardize this process have increased in recent years, appearing numerous mnemonic tools. Despite this, locals are heterogeneous and the level of training in this area is low **(Joy et al., 2018).**

Reporting is the verbal communication of data regarding the client's health status, needs, treatments, outcomes, and responses. As well, a report summarizes the current critical information that facilitates clinical decision- making and continuity of care. Recording and reporting are based on the nursing process, standards of care, and legal and ethical principles. The report should be concise and organized. As well, the nurse should be aware of what to be said, why, how to say, and the expected outcomes are needed **(Spooner et al., 2018).**

A bedside shift report reassures the patient that the nursing staff works as a team that everyone knows the plan of care. By working together, patients witness a safe, professional transfer of responsibilities; patients can ask questions, allowing the nurse and patient to share their information; and promotes involvement and improved satisfaction and patients' empowerment. Bedside shift- report has been shown to empower nursing staff, improve patient involvement, and allow for a safe transition of care between providers. It establishes and promotes trusting relationships between patients and staff members, which serve as a foundation for teamwork **(Schmidt et al., 2019).**

Significance of the study

Handover is important to ensure continuity of patient care and patient safety. It serves many functions and there are many factors that affect clinical handover. Poor clinical handover is associated with discontinuity of patient care and medical errors. Handover has been identified as a high priority in patient safety. In the US, interest in improving handover has increased with The Joint Commission issuing a requirement that hospitals implement a standardized approach to handover communications, including an opportunity to ask and respond to questions **(Mello et al., 2018).**

Over 96 percent to 100 percent of information was retained using the preprinted sheet containing patient information and verbal report. Only 31 percent to 58 percent of the data

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were retained using the note taking style and verbal report. The verbal-only style demonstrated the greatest amount of information loss, with retention ranging from 0 percent to 26 percent. None of the data was retained using the verbal-only method for two handoff cycles. The insertion of incorrect information was observed in the verbal-only method. The generation of incorrect data did not occur at all during the handoff with the written or preprinted form style of report **(Anderson, & Mangino, 2018)**. So, this study will assess nursing shift to shift handover in ICU.

Aim of the study

The aim of this study was to assess nursing shift-to-shift handover in intensive care unit through: assessing knowledge regarding nursing shift-to-shift handover in Intensive care unit and determine level of practice and attitude regarding nursing shift-to-shift handover in Intensive care unit.

Research questions:

1. What is the knowledge regarding nursing shift-to-shift handover in Intensive care unit?
2. What is the level of practice and attitude regarding nursing shift-to-shift handover in Intensive care unit?

Subjects and Methods

Research design:

Descriptive research design was used in conducting the current study.

Setting:

The current study was conducted at conducted in (Intensive Care Unit) at Beni-Suef General hospital.

Beni-Suef general hospital consists of three main buildings:

- Outpatient clinics building consists of 15 outpatient clinics serve several people and apply corona vaccine service for citizens.
- Obstetrics and Gynecology building provides delivery, maternity and family planning services.
- The building of the internal departments and Intensive Care Units consists of seven internal building and reception and emergency department.
- There are four intensive care units in Beni-suef general hospital (heart ICU has 12 patient bed, medical ICU has 14 patient bed, children ICU has 6 patient bed, brain and nerve ICU has 12 patient bed).

Subjects:

Convenient sample of all available nurses (69) in aforementioned setting.

Tools of data collection:

Two data collection tool was used to carry out the current study namely; Nurses' shift to shift handover knowledge questionnaire sheet, and Nursing shift-to- shift handover observational checklist.

Tool (I): Nurses' shift to shift handover knowledge questionnaire sheet (Appendix I): In order to assess nurses' knowledge during shift handover in intensive care unit. Adopted from **(Sanaa, 2016)**. It consists of two parts:

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Part 1: Nurse's personal characteristics: To collect personal characteristics data of the studied nurses. It includes age, gender, marital status, qualification and years of experience.

Part 2: Nurses' shift to shift handover knowledge questionnaire sheet (Appendix II): It included (35) multiple choice questions. It consisted of 3 dimensions as follows: communication (11 items), shift report handover (17 items) and patient safety (7 items).

Scoring System:

Each question was assigned a score of (one) if it was the correct answer and (zero) if it was incorrect answer, the maximum possible total score was thirty-five, Mean and Standard Deviation was calculated and then converted into percent, and then level was determined. Satisfactory knowledge if the total score was 60% or more, unsatisfactory knowledge if the total score was less than 60%.

Tool II: Nursing shift-to- shift handover observational checklist:

This tool was developed by **(Nadzam, 2014 & Sanaa, 2016)** then modified by the researcher after reviewing the literature to assess nurses' practice and attitude regarding nursing shift-to-shift handover in Intensive care unit, it consists of three dimensions as follows: clinical skills (30 items), ethical practice (2 items) and communication& interpersonal relations (4 items).

Scoring System:

The items had two levels of answers: "done", "not done". These were respectively scored 1 and zero. The scores of the items of each part were summed up and the total divided by the number of items, giving a mean score for the part. These scores were converted to a percent score and computed as adequate performance or inadequate performance. Total score of nurse's performance during shift handover considered "high" if the total score was 75% or more, "moderate" if the total score was from 60% to less than 75% and "low" if less than 60%.

Tools Validity:

Face and content validity of the study tools was assessed by jury group consisted of five experts (Professors) in nursing administration from different faculties of nursing. Jury group members judge tools for comprehensiveness, accuracy and clarity in language. Based on their recommendations correction, addition and / or omission of some items were done.

Tools Reliability:

The study tools were tested for its internal consistency by Cronbach's Alpha. It was 0.783 for Nurses' shift to shift handover knowledge questionnaire sheet, and 0.856 for nursing shift-to- shift handover observational checklist.

II- Operational Design:

The operational design for this study included three phases namely; preparatory phase, pilot study, and field work.

Preparatory phase:

This phase started with a review of current and past, national and international related literature concerning the subjects of the study, using textbooks, articles, journals, and websites. This review was helpful to the researcher in reviewing and developing the data collection tools, and then the researcher tested the validity of the tool through jury of expertise to test the content, knowledge, accuracy, and relevance of questions for tools.

Pilot study:

Pilot study was carried out on 10% of the total study sample (7 nurses) to evaluate the applicability, efficiency, clarity of tools, assessment of feasibility of field work, beside to detect any possible obstacles that might face the researcher and interfere with data collection.

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Necessary modifications were done based on the pilot study findings such as (omission of some questions from tool) in order to strengthen their contents or for more simplicity and clarity.

Field work:

Data collection of the study was started at the beginning of June 2020, and completed by the end of August 2020. The researcher attended the Intensive Care Unit at Beni-Suef General hospital three days per week from 9am to 2pm for the nurses that worked in Intensive Care Unit at Beni-Suef General hospital. The researcher first explained the aim of the study to nurses and reassures them that information collected was treated with confidentiality principals and will be used only for the purpose of the research.

The researcher met with the nursing director of the hospital to determine the suitable time to collect the data and confirm the days and times to assess staff nurses knowledge, and staff nurse's performance. The study was carried out through an assessment nurses' knowledge regarding Nurses' shift to shift handover knowledge questionnaire sheet, the questionnaire sheet took from 10:15 minutes. Assessment nurses' performance regarding Nurses' shift to shift handover observation checklist, the observation checklist took from 30:45 minutes.

III-Administrative Design

An official letter requesting permission to conduct the study was directed from the dean of the faculty of nursing Helwan University to director of Intensive Care Unit at Beni-Suef General hospital to obtain their approval to carry out this study. This letter included the aim the study and photocopy from data collection tools in order to get their permission and help for collection of data.

Ethical Consideration

Prior study conduction, ethical approval was obtained from the scientific research ethical committee of the faculty of nursing, Helwan University. The researcher met director of the Intensive Care Unit at Beni-Suef General hospital to clarify the aim of the study and take their approval. The researcher also met the staff nurses to explain the purpose of the study and obtain their approval to participate in the study. They were reassured about the anonymity and confidentiality of the collected data, which was used only for the purpose of scientific research. The subjects' right to withdraw from the study at any time was assured.

IV- Statistical Analysis:

The collected data were coded and entered into the statistical package for the social science (SPSS 23.0). Data was presented and suitable analysis was done according to the type of data obtained for each parameter. Data were presented using descriptive statistics in the form of frequencies and percentages for categorical variables, and means and standard deviations for continuous quantitative variables. Qualitative categorical variables were compared using Chi-square (X^2) test but when the expected count is less than 5 in more than 20% of the cells; Fisher's Exact Test was used. Person and spearman correlation was used to examine the correlation between quantitative and qualitative variables. Statistical significance was considered when P-value < 0.05.

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Results

Table (1): Number and Percentage Distribution of demographic data among The Studied Nurses (n=69)

Items		No.	%
Age (year)	▪ 20-<35	19	27.5
	▪ 35-<40	29	42.1
	▪ ≥ 40	21	30.4
	▪ **Mean± SD**	32.8 ± 4.6	
Gender	▪ Male	7	10.1
	▪ Female	62	89.9
Educational Level	▪ Diploma nursing degree	25	36.2
	▪ Technical Institute of Nursing	13	18.8
	▪ Bachelor nursing degree	22	31.9
	▪ Master's in nursing science	6	8.7
	▪ Doctorate in nursing science	3	4.3
Years of experience	▪ <5 years	22	31.9
	▪ 5-<10 years	3	4.3
	▪ 10 -< 15 years	13	18.8
	▪ ≥ 15	31	44.9
	▪ **Mean± SD**	8.13 ± 2.16	
Marital status	▪ Single	9	13
	▪ Married	49	71
	▪ Widowed	5	7.2
	▪ Divorced	6	8.7
Attending training courses	▪ Yes	21	30.4
	▪ No	48	69.6

Table (1): as regard to demographic characteristic of the studied nurses. It Illustrates that 42.1% of the age of the studied nurses was between 35-<40 years old with a mean age of 32.8 ± 4.6. Also, more than four fifth (89.9%) of the studied nurses were female. While regarding educational level, more than one third (36.2%) of the studied nurses had a diploma nursing degree. Additionally, considering years of experience, more than two fifth of them (44.9%) have experience ≥15 with a mean of (8.13 ± 2.16). Moreover, regarding marital status, (71%) of the studies nurses were married. Concerning, attending training programs about the shift-to-shift handover, (69.6%) of the studied nurses didn't have any training about the shift-to-shift handover.

1) Percentage Distribution of Total Satisfactory Knowledge Regarding Shift-to-Shift Handover among The Studied Nurses (n= 69).

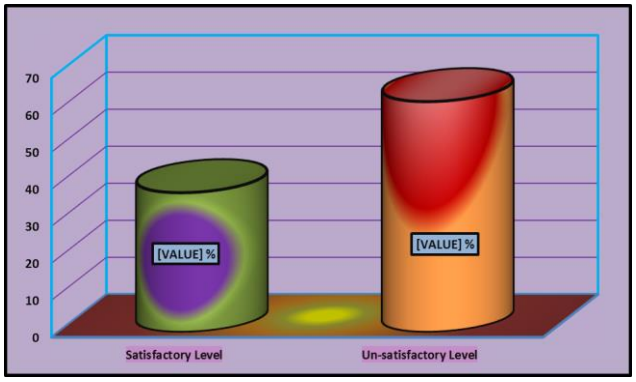

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Figure (1) which illustrates percentage distribution of total satisfactory knowledge regarding shift-to-shift handover among the studied nurses. It clarifies that more than two third (62.3 %) of the studied nurses had un-satisfactory level of knowledge regarding shift-to-shift handover. In addition to presence of difference between observed and expected values with a significant statistical difference at P = 0.041. Moreover, un-satisfactory to satisfactory level of knowledge ratio = 1.7:1.

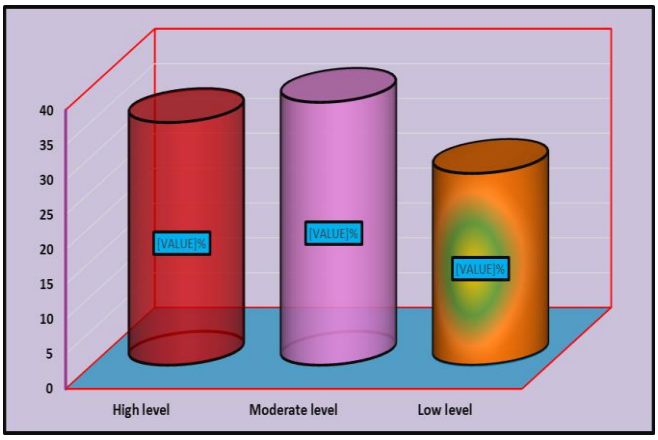
Table (2): Frequency Distribution of Total and Sub-Total Mean of Knowledge Score Regarding Shift Report Hand-off among the Studied Nurses (n= 69)

Variable		N	%	Min	Max	$\bar{x}$	SD	T test	P value
Communication	Satisfactory	26	37.7	14	22	20.62	2.45		
	Un-satisfactory	43	62.3	11	13	11.30	0.513		
	Total	69	100.0	11	22	14.8	4.8	2.78	0.007**
Shift Report	Satisfactory	25	36.2	28	34	33.64	1.25		
	Un-satisfactory	44	63.8	17	20	17.34	0.914		
	Total	69	100.0	17	34	23.25	7.96	2.97	0.004**
Patient Safety	Satisfactory	24	34.8	11	14	13.75	0.737		
	Un-satisfactory	45	65.2	7	8	7.16	0.367		
	Total	69	100.0	7	14	9.45	3.21	2.71	0.008**
Cumulative total	Satisfactory	26	37.7	42	70	67.04	9.71		
	Un-satisfactory	43	62.3	35	41	35.70	1.51		
	Total	69	100.0	35	70	47.51	15.87	2.88	0.005**

*Significant $p \leq 0.05$ **Highly significant $p \leq 0.01$

Table (2): it represents that the total mean score of knowledge regarding shift report hand-off among the studied nurses was $\bar{x} \pm$ SD= 47.51 $\pm$15.87 with a significant statistical difference at P = 0.005.

Part (III): Studied Nurses' practice and attitude regarding observational checklist of shift-to-shift handover.



χ^2=1.130, P= 0.568

Figure (2): Percentage Distribution of Level of practice and attitude Regarding Observational Checklist of Shift-to-Shift Handover among The Studied Nurses (n= 69).

Figure (2) which illustrates percentage distribution of total level of performance regarding observational checklist of shift-to-shift handover among the studied nurses. It clarifies that more than one third (37.3 %) of the studied nurses had moderate level of performance regarding observational checklist of shift-to-shift handover. Ther is no presence of

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difference between observed and expected values with a significant statistical difference at P > 0.05.

Table (3): Frequency Distribution of Total and Sub-Total Mean of Score of practice and attitude Regarding Observational Checklist of Shift Report Hand-off among the Studied Head Nurses (n= 69)

Variable		N	%	Min	Max	$\bar{x}$	SD	T test	P value
Clinical skill	Competent	26	37.7	46	60	55.35	4.8		
	In- Competent	43	62.3	30	44	36.21	4.1		
	Total	69	100.0	30	60	43.42	10.32	5.97	0.000**
Ethical practice	Competent	34	49.3	3	4	3.82	0.387		
	In- Competent	35	50.7	2	2	2.00	0.000		
	Total	69	100.0	2	4	2.90	0.957	4.32	0.000**
Communication & Interpersonal relations.	Competent	49	71	6	8	7.41	0.537		
	In- Competent	20	29	4	5	4.20	0.410		
	Total	69	100.0	4	8	6.48	1.54	8.99	0.000**
Cumulative total	Competent	24	34.8	59	72	68.00	4.40		
	In- Competent	45	65.2	36	53	44.69	5..89		
	Total	69	100.0	36	72	52.80	12.41	2.31	0.024*

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01

Table (3): it represents that the total mean score of performance regarding observational checklist of shift-to-shift handover among the studied nurses was $\bar{x} \pm$ SD= 52.80 ±12.41 with a significant statistical difference at P = 0.024.

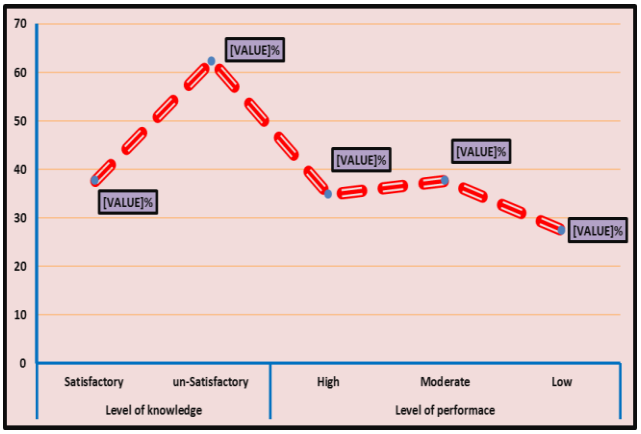

Figure (3): Percentage Distribution of Total Knowledge and level of practice and attitude Regarding Shift-to-Shift Handover among The Studied Nurses (n= 69).

Figure (3) which illustrates percentage distribution of total level of knowledge and performance regarding shift-to-shift handover among the studied nurses. It shows that more than two third (62.3%) of studied nurses had un-satisfactory level of knowledge regarding shift-to-shift handover. While more than one third (37.7%) of them had moderate level of performance regarding shift-to-shift handover.

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Part (IV): Additional and correlational findings between variable under the study

Table (4): Relation between Total Knowledge Regarding Shift-to-Shift Handover and demographic characteristics among the Studied Nurses (n= 69).

Demographic characteristics		Total Knowledge				X^2	P-Value
		Satisfactory		Un-Satisfactory			
		26	37.7	43	62.3		
		No.	%	No.	%		
Age (year)	▪ 20-<30	0	0.0	19	27.5	51.37	0.000**
	▪ 30-<40	5	7.2	24	34.8		
	▪ ≥ 40	21	30.4	0	0.0		
Gender	▪ Male	4	5.8	3	4.3	1.25	0.262
	▪ Female	22	31.9	40	58.0		
Educational level	▪ Diploma	0	0.0	25	36.2	52.54	0.000**
	▪ Technical	0	0.0	13	18.8		
	▪ Bachelor's degree	17	24.6	5	7.2		
	▪ Master's science	6	8.7	0	0.0		
	▪ Doctorate science	3	4.3	0	0.0		
Years of experience	▪ <5 years	22	31.9	0	0.0	65.1	0.000**
	▪ 5-<10 years	3	4.3	0	0.0		
	▪ 10 -< 15 years	1	1.4	12	17.4		
	▪ ≥ 15	0	0.0	31	44.9		
Marital status	▪ Single	9	13.0	0	0.0	21.72	0.000**
	▪ Married	17	24.6	32	46.4		
	▪ Widowed	0	0.0	5	7.2		
	▪ Divorced	0	0.0	6	8.7		
Attending training courses	▪ Yes	20	29.0	1	1.4	42.5	0.000**
	▪ No	6	8.7	42	60.9		

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01

Table (4): show that, there was a significant statistical relation between demographic characteristics (age, educational level, years of experience & marital status, attending training courses) and total level of knowledge regarding observational checklist of shift-to-shift handover and demographic characteristics among the studied nurses, at P = 0.000.

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Table (5): Relation between Total of Level of Performance Regarding Observational Checklist of Shift-to-Shift Handover and demographic characteristics among the Studied Nurses (n= 69).

Demographic characteristics		Total practice and attitude						X^2	P-Value
		High		Moderate		Low			
		24	34.8	26	37.7	19	27.5		
		N	%	N	%	N.	%		
Age (year)	▪ 20-<30	0	0.0	0	0.0	19	27.5	123.1	0.000**
	▪ 30-<40	3	4.3	26	37.7	0	0.0		
	▪ ≥ 40	21	30.4	0	0.0	0	0.0		
Gender	▪ Male	4	5.8	0	0.0	3	4.3	4.71	0.094
	▪ Female	20	29.0	26	37.7	16	23.2		
Educational level	▪ Diploma	0	0.0	6	8.7	19	27.5	82.9	0.000**
	▪ Technical	0	0.0	13	18.8	0	0.0		
	▪ Bachelor's degree	15	21.7	7	10.1	0	0.0		
	▪ Master's science	6	8.7	0	0.0	0	0.0		
	▪ Doctorate science	3	4.3	0	0.0	0	0.0		
Years of experience	▪ <5 years	22	31.9	0	0.0	0	0.0	88.1	0.000**
	▪ 5-<10 years	2	2.9	1	1.4	0	0.0		
	▪ 10 -< 15 years	0	0.0	13	18.8	0	0.0		
	▪ ≥ 15	0	0.0	12	17.4	19	27.5		
Marital status	▪ Single	9	13.0	0	0.0	0	0.0	51.37	0.000**
	▪ Married	15	21.7	26	37.7	8	11.6		
	▪ Widowed	0	0.0	0	0.0	5	7.2		
	▪ Divorced	0	0.0	0	0.0	6	8.7		
Attending training courses	▪ Yes	20	29.0	0	0.0	1	1.4	48.7	0.000**
	▪ No	4	5.8	26	37.7	18	26.1		

*Significant p ≤ 0.05 **Highly significant p ≤ 0.01

Table (5): show that, there was a significant statistical relation between demographic characteristics (age, educational level, years of experience & marital status, attending training courses) and total level of performance regarding observational checklist of shift-to-shift handover among the studied nurses, at P = 0.000.

Figure (4): Correlation between Total Knowledge and total level of practice and attitude Regarding Shift-to-Shift Handover among the Studied Nurses (n= 69).

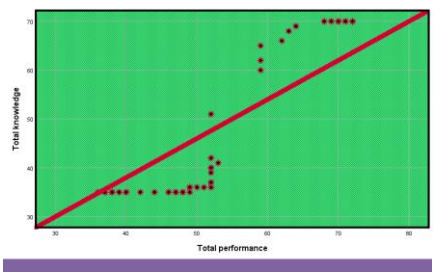

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Figure **(4)** illustrated correlation between total of level of knowledge and total level of performance regarding shift-to-shift handover among the studied nurses. It clarifies that, there was highly statistically positive correlation between correlation between total of level of knowledge and total level of performance regarding shift-to-shift handover among the studied nurses at (r= 0.934 & P= 0.000).

Discussion

Getting a good nursing report before starting shift is vitally important. It is not only important for the nurse, but for the patient as well. A nursing report is given at the end of the nurses' shift to another nurse that will be taking over care for that particular patient. Nurses' shift reports are routine occurrences in healthcare organizations that are viewed as crucial for patient outcomes, patient safety, and continuity of care. A nursing report is usually given in a location where other people cannot hear due to patient privacy **(Inanloo, et al., 2017)**.

So, the current study aimed to assess nursing shift-to-shift handover in intensive care units through assessing knowledge regarding nursing shift-to-shift handover in the intensive care units and determine the level of practice and attitude regarding nursing shift-to-shift handover in the intensive care units through the following sequence.

Regarding demographic characteristics, the current study showed that less than half of nurses were 35- less than 40 years. Additionally, the majority of studied nurses were females with more than one-third of them had nursing school diplomas. Furthermore, less than half of them had experienced of more than 15 years, and two-thirds of nurses were married. Finally, less than two-thirds of nurses did not attend training courses.

This result agreed with **Mio et al. (2020)** who conducted a study entitled "Materiality in integrated and sustainability reporting" and found that the majority of nurses were female and married. Also, this result was supported by **Mardis et al. (2016)** who conducted a study entitled "Bedside shift-to-shift handoffs" and found that more than one-third of nurses had a nursing diploma, and less than half of nurses were (30-40) years old.

Conversely, this result disagreed with **Grimshaw et al. (2020)** who conducted a study entitled "A qualitative study of the change-of-shift report at the patients' bedside" and found that the majority of nurses had technical nursing institute and had experiences from (5-10) years. From the investigators' point of view, this result may be due to a different place selection.

Concerning nurses' knowledge about shift report handoff, less than two-thirds of the studied nurses had an unsatisfactory level of knowledge regarding patient safety, communication, and shift report. From the investigators' point of view, this result may be due to a lack of training courses and a decreased level of education.

This result was reinforced by **McGinn (2017)** who conducted a study entitled "Nurses perceptions' of bedside reporting on an intensive care unit following implementation" and found that less than two-thirds of nurses had decreased level of knowledge regarding communication and patient safety.

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Relating to the nurses' total level of knowledge, the current study showed that nearly half of nurses had a satisfactory level of knowledge about the handover. Meanwhile, nearly two-thirds of them had an unsatisfactory level of knowledge about patient safety during shift handover. From the investigators' point of view, this result may be due to the staff nurses needing an orientation period about how to use shift reports with effective methods.

This result was in accordance with **John & Michelle, (2016)** who conducted a study entitled "Bedside reporting at the change of shift" and found that the majority of the studied nurses had an unsatisfactory level of knowledge. Conversely, this result disagreed with **Hill, (2020)** who conducted a study entitled "Considerations in use and reporting of the retrospective pretest" and found that more than three-quarters of the studied nurses had a satisfactory level of knowledge.

Concerning the nursing level of performance, nearly three-quarters of nurses had a competent level of skills regarding communication and interpersonal relations. Meanwhile, more than three-fifths of them had an incompetent level of skills regarding clinical skills. From the investigators' point of view, nurses needed more practice training on clinical skills.

This result was in accordance with **Bigham et al. (2020)** who conducted an entitled "Using the international integrated reporting framework" and found that more than three-fifths of nurses had lacking clinical skills.

On the topic of the relation between nurses' demographic characteristics and their total level of knowledge, the current study showed that there is a statistically significant relation between demographic characteristics (age, educational level, years of experience & marital status, attending training courses) and total level of knowledge about shift-to-shift handover.

This result was in arrangement with **Abdalla et al, (2020)** who conducted entitled "Perception of medication errors' causes and reporting among nurses in teaching hospitals" and found that there was a statistically significant relation between nurses' total level of knowledge about shift-to-shift handover and their ages, qualifications, and training course.

In the same line, this result agreed with **Vrbnjak et al., (2016)** who conducted entitled "Barriers to reporting medication errors and near misses among nurses" and found that there is a highly statistically significant relation between nurses' total level of knowledge about shift-to-shift handover and their gender, ages, and qualifications.

Conversely, this result was in dissimilarity with **Foster et al, (2019)** who conducted a study entitled "Emergency room nurses' views on bedside shift reporting" and found that there is no statistically significant relation between nurses' total level of knowledge about the shift-to-shift handover and their ages, and qualifications.

Regarding the relation between nurses' demographic characteristics and their total level of performance**,** the current study showed that there is a statistically significant relationship between demographic characteristics (age, educational level, years of experience & marital status, attending training courses) and total level of performance about the shift-to-shift handover.

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This result was in congruence with **Buus, Hoeck & Hamilton (2017)** who conducted a study entitled "Nurses' shift reports: a systematic literature search and critical review of qualitative field studies" and found that there is a highly statistically significant relation between nurses' total level of performance about the shift-to-shift handover and their gender and years of experience.

Regarding the correlation between nurses' total level of knowledge and their total level of performance about the shift-to-shift handover**,** the current study showed that there is a highly statistically positive correlation between the total level of knowledge and total level of performance regarding shift-to-shift handover among the studied nurses at (r= 0.934 & P= 0.000).

This result was in accordance with **Inanloo et al, (2017)** who conducted a study entitled "The effect of shift reporting training using the SBAR tool on the performance of nurses working in intensive care units" and found that there is a highly statistically significant correlation between nurses' total level of knowledge scores and their total level of performance.

On the other hand, result was disagreement with **Ghosh et al, (2018)** who conducted a study entitled "An exploratory study on how to improve bedside change-of-shift process: Evidence from one hospital using technology to support verbal reporting" and found that there is no statistically significant correlation between nurses' total knowledge scores and their total performance.

One of the major responsibilities of nursing profession is how to communicate, report, take report, record information, and shift-to-shift handover. Besides recording the written report of nurses, oral report is a communication method which its purpose is to transfer essential and key information about patients' medical care. As mentioned, one of the practical reports of nurses is work shift-to-shift delivery report when the responsible nurse for caring the patient provides the other nurses with a summary of patient's activities and condition at the time of leaving the unit to rest or deliver his or her shift so nurses needed to get in-service training program on shift-to-shift handover **(Ghosh et al., 2018).**

Conclusion

In the light of the current study results, it can be concluded that more than one-third of nurses had a satisfactory level of knowledge about shift-to-shift handover compared to less than two-thirds of them had unsatisfactory level of knowledge. Supplementary, more than one-quarter of nurses had a low level of performance regarding shift-to-shift handover, paralleled to more than one-third of them had a moderate level of performance, and nearly one third of them had a high level of performance. Accompanying, there was a highly statistically positive correlation between total of level of knowledge and total level of performance regarding shift-to-shift handover among the studied nurses at (r= 0.934 & P= 0.000).

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Recommendation

In the light of results of this study, the following recommendations were suggested:

At Organizational level

- Develop convenient occupational health and nursing policies inside the organization.
- Improve resources and development of activities to help nurses for better handover and performance.
- Develop counseling office to help nurses for better handover and performance.

At Educational level

- Conducting periodic assessment for nursing shift-to-shift handover in intensive care unit.
- Giving sufficient training for staff nurses on nursing shift-to-shift handover in intensive care unit.
- Helping staff nurses to enhance nursing shift-to-shift handover in intensive care unit.

At Personal level

- Encouraging staff nurses to keep on nursing shift-to-shift handover in intensive care unit.
- Provide nursing shift-to-shift handover in intensive care unit to support patients.
- Conducting nursing shift-to-shift handover in intensive care unit to prevent stress for nursing staff

Further studies

- Replication of the study on large sample size and in different setting about shift-to-shift handover in different nursing units.
- Future research to assess the effect of nursing training program regarding nursing shift-to-shift handover on nurses.

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