

# The Effect of Implementing the Training Program of iSoBAR Shift Handover Report on Nurses' Patient Handover

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**Abstract:** Communication is at the heart of nursing and is essential in conveying caring and applying nursing skills and knowledge. On a daily basis, in every “healthcare facility, the responsibility for the care of patients is transferred between care providers. This process occurs in active 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.”. Aim: This study was designed to investigate the effect of implementing a training program of iSoBAR shift report on nurse’s handover shift report. Design: A quasi-experimental research design with pre, immediate post and follow up evaluation was utilized to achieve the aim of the study. Sample: It was a convenient sample consisted of 75 nurses working at critical care units, at El Menoufia University Hospital. Setting: The study was conducted in the critical care units, at El Menoufia University Hospital. Tools: Three tools were used for data collection, knowledge questionnaire, Observational Checklist and the training program. Results: There was highly significant positive correlation between total nurses’ knowledge and their practice towards iSoBAR shift report at immediate post implementation of a training program. Conclusion: This study concluded that the implemented of the iSoBAR shift report training program sessions on their knowledge and practice as the implementation of the planned iSoBAR shift report training program was significantly effective as a method to improve the knowledge and practice of critical care nurses as regards nurse’s handover shift report. Recommendations: Similar study can be repeated by increasing the size of the sample for generalization the study, Healthcare facilities and educational institutions should adopt the use of the iSoBAR and provide continuous instructions for the iSoBAR tool throughout the curriculum includes specific applications at each student’s level.

**Keywords:** iSoBAR shift report, Training program.

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## I. INTRODUCTION

Patient's clinical handover which could be a critical organizational and clinical process is taken into account one of the fundamental responsibilities of nurses. During this regard, lack of tools and resources to be applied for this purpose threatens the life of patients. Traditionally, clinical handover skills were learned at local level instead of through formal education processes, this subsequently resulted in a plethora of approaches to both the content and function of clinical handover and particularly how it's given and/or received. It has been identified that poor handover processes may end in poor communication which can subsequently negatively impact on patient safety (*Spooner, et al. 2019*).

Numerous barriers to effective clinical handover have also been identified like informal structure, unnecessary content, lengthy duration, disturbances and lack of confidence. While there's a limited evidence base to guide clinical handover, there's an urgency to enhance and standardize the practice to optimize the method, contributing to seamless and reliable information transfer, minimizing variability and reducing risks for patients. Effective clinical handover will be enabled by

having clear procedures, supportive work environments and educating staff on the potential work of handover on patient safety (*Curtis, Elphick & Eyles, 2020*).

Factors known to reduce the effectiveness of clinical handover include interruptions from staff external to the handover event, telephone calls, extraneous talking and noise, staff hesitancy in complying with standardized communication processes and also the “human factor” in inter-professional communication. Numerous intervention studies support the employment of mnemonic tools to reinforce handover quality and information transfer (*Boje & Ludvigsen, 2020*), including the ISBAR tool, which has been demonstrated to result in improved content similarly as supporting higher-quality communication. Additionally, the utilization of ISBAR during bedside handover may result in improved patient involvement in care (*Yetti, Dewi, and Warashati, 2021*).

Adverse events associated with clinical handover and therefore the growing evidence base regarding the effectiveness of handover improvement programs have led professional and statutory bodies associated with healthcare quality and safety to issue evidence-based recommendations and/or clinical guidelines on best practice in clinical handover. These include the recommendation that handover should occur within adequate protected time (*Ehlers et al. 2021*), in an environment conducive to effective communication, including access to additional clinically relevant information like laboratory reports, and free from interruptions and distractions. Published guidelines also recommend that handover should comprise a written document, alongside face-to-face verbal handover (*Wibrandt & Lippert, 2020*).

Effective interpersonal communication is prime to safe patient care. It lies at the core of the continuum of care from nurse to nurse, from shift to shift, between departments and between hospitals. Shift-to-shift nursing handover has been identified as high risk area during which improved clinical handover solutions are urgently required, clinical handover requires a transfer of data, responsibility, accountability for patient care unless the receiver of the information during handover understands and acts upon the information given, continuity of patient care won't be achieved. In which major factors inhabiting handover improvement include the lack of basic understanding of handover process and also the absence of common structure (*Burgess et al., 2020*).

#### SIGNIFICANCE OF THE STUDY

Patient handover between nurses at shift change has been a crucial process in clinical nursing practice, allowing nurses to exchange necessary patient information to ensure patient safety continuity of care and promote patient health care. On the other hand, the omission of accurate, timely, easily accessible vital information by health care provider significantly increases risk of patient harm and can have devastating consequences for patient care, (*Powell et al., 2020*). For instance, in the United States, it is estimated that 80 % of serious medical errors have been attributed to breakdown in communication during handover and an analysis of local incident and clinical review reports indicates that up to 70% of adverse events occur because of miscommunication at points of transition or handover of care (*Wang, He & Feng, 2021*). In Egypt, there is no evidence of using iSoBAR shift handover report. So, it's essential to utilize a standardized communication way in handover process, especially there is a lack of dedicated tool to support patient handover activities and the nurses continue to use verbal reports during handover rely on memory.

#### AIM OF THE STUDY

This study aims to determine the effect of implementing a training program of iSoBAR shift report on nurse's handover shift report through:

1. Assess nurses' knowledge toward using iSoBAR shift report.
2. Assess nurses' performance toward using iSoBAR shift report.
3. Develop a training program on using iSoBAR shift report for staff nurses working at critical care units at El Menoufia University Hospital based on their assessment.
4. Implement a training program on using iSoBAR shift report for staff nurses working at critical care units at El Menoufia University Hospital based on their assessment.
5. Evaluate the effect of the implemented program on nursing handover reports.

## RESEARCH HYPOTHESIS

iSoBAR shift report of nurses will improve quality of nurses reporting of patient care after the program than before the implementing program.

## II. SUBJECTS AND METHODS

**Design:** A quasi-experimental research design with pre, immediate post and follow up evaluation was utilized to achieve the aim of the study.

**Subjects:** It was a convenient sample consists of 75 nurses working at critical care units in the aforesaid study setting, at El Menoufia University Hospital at the time of the study.

**Setting:** The study was conducted at the ICUs in El Menoufia university Hospital, Egypt.

### Tools of Data Collection:

Data were collected using the following tools:

**Tool I: Self-administered interview questionnaire:** It was developed by the investigator after reviewing the related literature from (*JCI, 2015*). It consisted of two parts, Socio-demographic Characteristics, and observational checklist.

#### First Part: Demographic Characteristics:

It was developed by the investigator after reviewing the related literature. It consisted 6 self- reported questions included: Job title, Working unit, Education Level, Experience years, Age, and Gender.

#### Second Part: The Knowledge Questionnaire:

The questionnaire sheet was used to assess staff nurses' knowledge about iSoBAR shift report before and after implementing the program, it consisted of 18 self-reported questions.

**Tool II: An observational check list (Appendix II).** It was adapted from (*Müller et al., 2018*). It is an observational checklist consisted of 18 items that assess nurses' practice utilizing iSoBAR shift report in intensive care unit.

#### Tool III: The Training program (appendix III).

The Training program for nurses working in intensive care units regarding their application of iSoBAR shift report was developed by the researcher based on nurse's needs assessment to include setting objectives, preparing the educational materials and designing the methodology and media. The materials for the program were obtained from textbooks, journals, periodicals, magazines, the Internet and professor in the field to ascertain relevance, clarity and completeness of the program, experts elicited responses, which were either agree or disagree for the face validity and content reliability.

### Methods of data collection:

The study was conducted according to the following steps:

An official approval letter clarifying the purpose of the present study was issued from the Dean of the Faculty of Nursing at Helwan University, to the General Director El- Menuofia University Hospital, and Scientific Research Ethical Committee in the Faculty of Nursing as an approval to conduct this study. The tool used in the study was developed by the researcher after reviewing the relevant and related literature. All studied nurses (n= 75) were invited to participate in the study. This study started from beginning of December 2019, till the end of August 2020 for data collection. Data were collected through three phases: Assessment phase (pre-test), implementation phase (conducting education program), and follow up and evaluation phase (post-test):

#### I. Assessment phase:

In the beginning, data was collected from nurses working at intensive care units in morning, and afternoon shifts with average of 7 nurses per week. Time required for filling the socio-demographic sheet and knowledge questionnaire was estimated to be between 30 and 45 minutes. Each nurse was then observed two times (morning and afternoon) shifts during interaction with patients and the investigator filled the observational checklist himself.

## II. Implementation phase:

Each session consumed approximately 45 minutes. The Sample (75 nurses) were divided into small groups (15 nurses per session). Each group received the same program content using the same teaching strategies and hand out.

## III. Evaluation phase:

After completion the iSoBAR shift report training program, the investigator introduced the post-program tools set and asked the participants to fill, then the investigator observed each nurse utilizing the checklist for three times during interaction with another nurse in the beginning of the shift, by the end of the shift and with patient transfer to another department or hospital.

## Ethical Considerations

All official permissions to carry out the study were secured from pertinent authorities. All nurses were informed about the importance and aim of this study. Oral consents were obtained from all the studied nurses. All nurses were informed that their participation voluntary and they had the rights to withdraw at any time without giving any reason and confidentiality of the information were assured. As well, the nurses were informed that the collected data would be used only for the purpose of the present research, as well as for their benefits.

## Statistical analysis:

The collected data were organized, analyzed using appropriate statistical significant tests. The data were collected and coded using the Computer Statistical Package for Social Science (SPSS), version 20.0, and was also used to do the statistical analysis of data. Microsoft Office Excel software was used to construct the needed graphs. Data were presented using descriptive statistics in the form of frequencies and percentages. Pearson, and t tests were used to compare frequencies and correlation between study variables

## Degrees of significance of results were considered as follow:

p-value > 0.05 not significant (NS).

p-value ≤ 0.05 Significant (S).

p-value ≤ 0.01 Highly Significant (HS).

## III. RESULTS

**Table (1)** showed that, 64% of the studied nurses their age ranged between 26- ≤ 35 years with mean  $31.94 \pm 2.31$  year. Related to gender and job title, 62.7% and 90.7% of the studied nurses were female and staff nurse, respectively. Also, 34.7% of the studied nurses working in a Medical Intensive care units. Regarding to education level, 53.3% of them had associate degree in nursing. Also, 49.3% of the studied nurses their years of experience ranged between 3- ≤ 7 years with mean  $8.45 \pm 2.30$  years.

**Table (2)** indicated that, there was a marked improvement in nurses' knowledge about communication post implementation of a training program with highly statistically significant difference at ( $P = < 0.01$ ) between pre, immediate post and follow-up implementation of a training program.

**Table (3)** indicated that, there was a marked improvement in nurses' knowledge about iSoBAR shift report post implementation of a training program with highly statistically significant difference at ( $P = < 0.01$ ) between pre, immediate post and follow-up implementation of a training program.

**Figure (1)** showed that, 76% of nurses had poor level of total knowledge about iSoBAR shift report before program implementation. While after program implementation, 80% of nurses had good level of total knowledge. Also, 73.3% of nurses had good level of total knowledge at follow-up implementation of a training program.

**Table (5)** presented that, there was a marked improvement in nurses' practice regarding to organizing hand-over process before the time of hand-over post implementation of a training program with highly statistically significant difference at ( $P = < 0.01$ ) between pre, immediate post and follow-up implementation of a training program.

**Table (6)** revealed that, there was a marked improvement in nurses’ practice regarding to process of hand-over post implementation of a training program with highly statistically significant difference at ( $P = < 0.01$ ) between pre, immediate post and follow-up implementation of a training program.

**Figure (2)** showed that, 82.7% of nurses had unsatisfactory level of total practice towards iSoBAR shift report. While after program implementation, 80% of nurses had satisfactory level of total practice. Also, 74.7% of nurses had satisfactory level of total practice at follow-up implementation of a training program.

**Table (10)** demonstrate that, there was highly statistically significant relation between total nurses’ knowledge at immediate post implementation of a training program and their socio-demographic characteristics as education level and experience years at ( $P = < 0.01$ ). Also, there was statistically significant relation with their age, Job title at ( $P = < 0.05$ ). While, there was no statistically significant relation with their gender and working unit at ( $P = > 0.05$ ).

**Table (11)** reveal that, there was highly statistically significant relation between total nurses’ practice at immediate post implementation of a training program and their socio-demographic characteristics as education level and experience years at ( $P = < 0.01$ ). Also, there was statistically significant relation with their age, Job title at ( $P = < 0.05$ ). While, there was no statistically significant relation with their gender and working unit at ( $P = > 0.05$ ).

**Table (12)** showed that, there was highly significant positive correlation between total nurses’ knowledge and their practice towards iSoBAR shift report at immediate post implementation of a training program at ( $P = < 0.01$ ).

**Table (1): Number and percentage distribution of the studied nurses according to their demographic data (n=75).**

Items	N	%
<b>Age (Year)</b>		
≤ 25	10	13.3
26- ≤ 35	48	64
36- ≤ 45	12	16
46- ≤ 55	4	5.3
≥ 56	1	1.4
<b>Mean SD</b>	<b>31.94 ± 2.31</b>	
<b>Gender</b>		
Male	28	37.3
Female	47	62.7
<b>Job title</b>		
Staff Nurse.	68	90.7
Head Nurse	7	9.3
<b>Working unit</b>		
Medical Intensive care units	26	34.7
Surgical Intensive care units	24	32
Pediatric Intensive care units	14	18.7
Neonatal Intensive care units	11	14.6
<b>Education Level</b>		
Diploma in Nursing	8	10.7
Associate Degree in Nursing	40	53.3
Bachelor of Nursing Science	22	29.3
Postgraduate	5	6.7
<b>Experience years</b>		
≤ 2	8	10.7
3- ≤ 7	37	49.3
8- ≤ 12	15	20
≥ 13	15	20
<b>Mean SD</b>	<b>8.45 ± 2.30</b>	

**Table (2): Comparison between the studied nurses regarding to their knowledge about communication at pre, immediate post and follow-up implementation of a training program (n=75).**

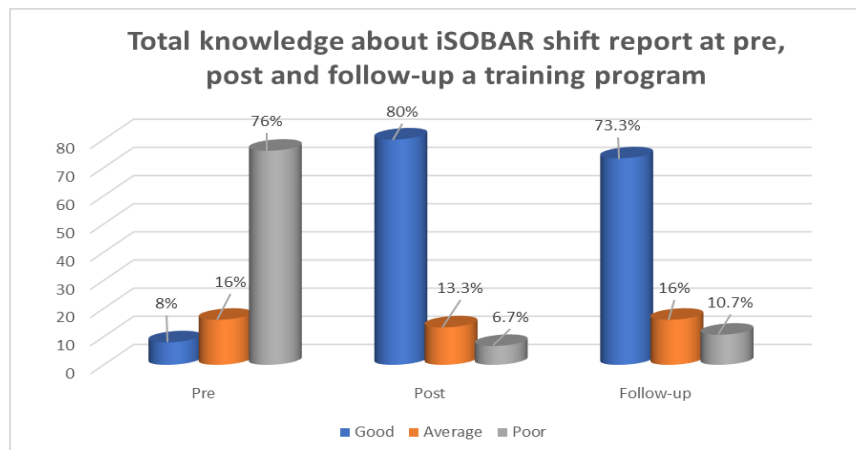
Items	Pre				Immediate Post				Follow-up				Friedman	
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect		F	p-value
	N	%	N	%	N	%	N	%	N	%	N	%		
Definition of Communication	20	26.7	55	73.3	70	93.3	5	6.7	62	82.7	13	17.3	10.31	.000**
Principles of effective communication	12	16	63	84	65	86.7	10	13.3	60	80	15	20	8.015	.000**
Elements of basic communication	28	37.3	47	63.7	68	90.7	7	9.3	65	86.7	10	13.3	9.187	.005**
Methods of Verbal communication	25	33.3	50	66.7	70	93.3	5	6.7	68	90.7	7	9.3	10.60	.008**

\*\*p-value <0.01 HS.

**Table (3): Comparison between the studied nurses regarding to their knowledge about iSoBAR shift report at pre, immediate post and follow-up implementation of a training program (n=75).**

Items	Pre				Immediate Post				Follow-up				Friedman	
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect		F	p-value
	N	%	N	%	N	%	N	%	N	%	N	%		
Definition of Report	18	24	57	76	72	96	3	4	68	90.7	7	9.3	10.04	.003**
Types of intra-departmental report	10	13.3	65	86.7	65	86.7	10	13.3	62	82.7	13	17.3	11.96	.001**
Definition of iSoBAR shift report	8	10.7	67	89.3	68	90.7	7	9.3	65	86.7	10	13.3	10.75	.000**
The acronym (iSoBAR) refers to	2	2.2	73	9.7	64	85.3	11	14.7	60	80	15	20	13.25	.000**
Aim of nursing shift report	48	64	27	36	75	100	0	0.0	70	93.3	5	6.7	9.016	.008**
Responsible for iSoBAR shift report writing	22	29.3	53	70.7	72	96	3	4	66	88	9	12	10.09	.003**
iSoBAR shift report is exchanged between	10	13.3	65	86.7	65	86.7	10	13.3	62	82.7	13	17.3	12.44	.000**

\*\*p-value <0.01 HS.



**Figure (1): Distribution of the studied nurses regarding to total knowledge about iSoBAR shift report at pre, immediate post and follow-up implementation of a training program (n=75).**

**Table (5): Comparison between the studied nurses regarding to organizing hand-over process before the time of hand-over at pre, immediate post and follow-up implementation of a training program (n=75).**

Items	Pre				Immediate Post				Follow-up				Friedman	
	Done		Not done		Done		Not done		Done		Not done		F	p-value
	N	%	N	%	N	%	N	%	N	%	N	%		
Review the report content of each patient	8	10.7	67	86.7	68	90.7	7	9.3	64	85.3	11	14.7	12.98	.000**
Make sure that all significant data is documented and completed.	10	13.3	65	86.7	60	80	15	20	58	77.3	17	22.7	11.05	.001**
Make sure that all report is														
A. Direct.	5	6.7	70	93.3	64	85.3	11	14.7	60	80	15	20	13.09	.000**
B. Clear& Concise.	5	6.7	70	93.3	66	88	9	12	63	84	12	16	12.99	.000**
C. Easy to change.	8	10.7	67	89.3	64	85.3	11	14.7	62	82.7	13	17.3	13.14	.000**
D. Organized	16	21.3	59	78.7	68	90.7	7	9.3	65	86.7	10	13.3	12.92	.000**
Make sure that all reports are present in the patient's file	12	16	63	84	70	93.3	5	6.7	64	85.3	11	14.7	14.05	.000**
Ask all staff nurses about patient' condition.	20	26.7	55	73.3	68	90.7	7	9.3	65	86.7	10	13.3	10.92	.008**
Make sure that all staff nurses are present before the time of hand-over.	5	6.7	70	93.3	60	80	15	20	55	73.3	20	26.7	12.36	.000**
Make sure that all patients are presented in the unit.	5	6.7	70	93.3	58	77.3	17	22.7	55	73.3	20	26.7	10.95	.008**
Make sure that the place of hand-over is														
A. Quiet.	6	8	69	92	52	69.3	23	30.7	48	64	27	36	9.670	.009**
Suitable for exchange.	5	6.7	70	93.3	50	66.7	25	33.3	48	64	27	36	9.402	.009**

\*\*Highly significant at  $p < 0.01$ .

**Table (6): Comparison between the studied nurses regarding to process of hand-over at pre, immediate post and follow-up implementation of a training program (n=75).**

Items	Pre				Immediate Post				Follow-up				Friedman	
	Done		Not done		Done		Not done		Done		Not done		F	p-value
	N	%	N	%	N	%	N	%	N	%	N	%		
Attend during hand-over process.	5	6.7	70	93.3	70	93.3	5	6.7	62	82.7	13	17.3	14.32	.000**
Clarify any point if needed.	8	10.7	67	86.7	70	93.3	5	6.7	65	86.7	10	13.3	12.36	.000**
Make sure that staff nurse exchange all the contents of the report.	5	6.7	70	93.3	60	80	15	20	58	77.3	17	22.7	11.95	.001**

\*\*Highly significant at  $p < 0.01$ .

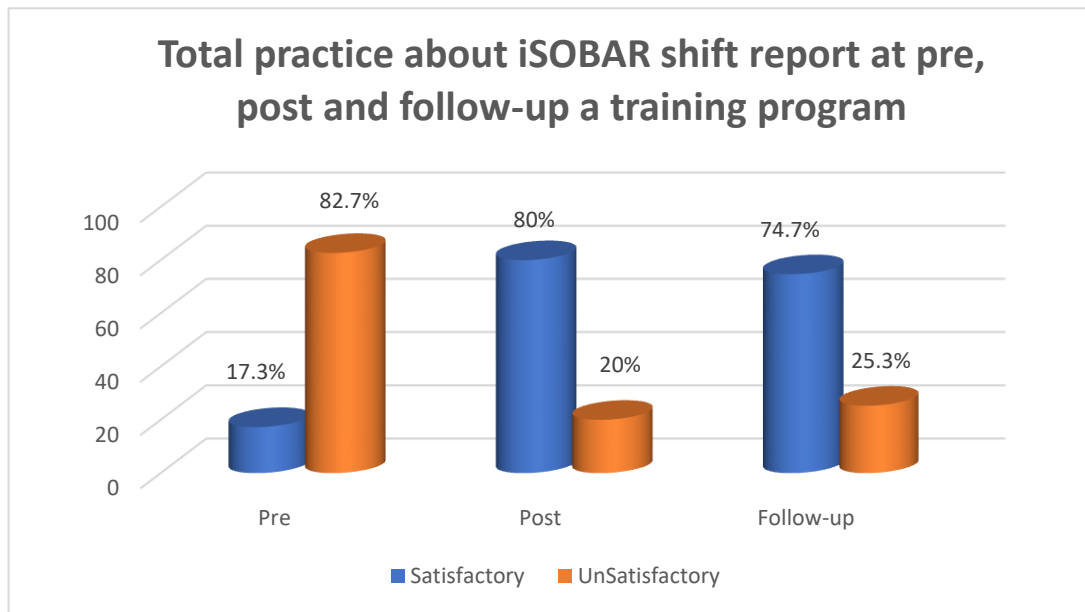


Figure (2): Distribution of the studied nurses regarding to total practice about iSoBAR shift report at pre, immediate post and follow-up implementation of a training program (n=75).

Table (10): Relation between nurses' demographic characteristics and their total knowledge about iSoBAR shift report at immediate post implementation of a training program (n=75).

Items		Total knowledge at immediate post implementation of a training program						X2	P-Value
		Good (n=60)		Average (n=10)		Poor (n=5)			
		N	%	N	%	N	%		
Age (year)	≤ 25	5	8.3	5	50	0	0.0	9.328	.018*
	26- ≤ 35	46	76.7	2	20	0	0.0		
	36- ≤ 45	9	15	3	30	0	0.0		
	46- ≤ 55	0	0.0	0	0.0	4	80		
	≥ 56	0	0.0	0	0.0	1	20		
Gender	Male	20	33.3	5	50	3	60	3.026	.127
	Female	40	66.7	5	50	2	40		
Job title	Staff Nurse.	54	90	9	90	5	100	9.562	0.01*
	Head Nurse	6	10	1	10	0	0.0		
Working unit	Medical	21	35	4	40	1	20	1.994	.264
	Surgical	21	35	2	20	1	20		
	Pediatric	10	16.7	2	20	2	40		
	Neonatal	8	13.3	2	20	1	20		
Education Level	Diploma in Nursing	0	0.0	3	30	5	100	17.10	.000**
	Associate Degree in Nursing	33	55	7	70	0	0.0		
	Bachelor of Nursing Science	22	36.7	0	0.0	0	0.0		
	Postgraduate	5	8.3	0	0.0	0	0.0		
Experience years	≤ 2	5	8.3	3	30	0	0.0	15.60	.006**
	3- ≤ 7	35	58.3	2	20	0	0.0		
	8- ≤ 12	12	20	3	30	0	0.0		
	≥ 13	8	8.3	2	20	5	100		

\*Significant at p < 0.05. \*\*Highly significant at p < 0.01.



**Table (11): Relation between nurses’ demographic characteristics and their total practice about iSoBAR shift report at immediate post implementation of a training program (n=75).**

Items		Total knowledge at immediate post implementation of a training program				X2	P-Value
		Satisfactory (n=60)		Unsatisfactory (n=15)			
		N	%	N	%		
Age (year)	≤ 25	8	13.3	2	13.3	8.255	.023*
	26- ≤ 35	46	76.7	2	13.3		
	36- ≤ 45	6	10	6	40		
	46- ≤ 55	0	0.0	4	26.7		
	≥ 56	0	0.0	1	6.7		
Gender	Male	22	36.7	6	40	1.922	.191
	Female	38	63.3	9	60		
Job title	Staff Nurse.	54	90	14	93.3	7.660	0.044*
	Head Nurse	6	10	1	6.7		
Working unit	Medical ICU	20	33.3	6	40	1.994	.264
	Surgical ICU	20	33.3	4	26.7		
	Chest ICU	11	18.3	3	20		
	CCU	9	15	2	13.3		
Education Level	Diploma in Nursing	0	0.0	8	53.3	18.05	.000**
	Associate Degree in Nursing	33	55	7	46.7		
	Bachelor of Nursing Science	22	36.7	0	0.0		
	Postgraduate	5	8.3	0	0.0		
Experience years	≤ 2	7	11.7	1	6.7	13.25	.009**
	3- ≤ 7	35	58.3	2	13.3		
	8- ≤ 12	12	20	3	20		
	≥ 13	6	10	9	60		

\*significant at  $p < 0.05$ . \*\*highly significant at  $p < 0.01$ .

**Table (12): Correlation between total nurses’ knowledge and their performance about iSoBAR shift report at immediate post implementation of a training program.**

Items	Total practice	
Total knowledge	R	.612
	p- value	.000**

\*\*p-value < 0.01 HS.

#### IV. DISCUSSION

An effective handover supports the exchange of important information and continuity of care and treatment. However, the ineffective handover can leads to gaps in patient care and breaches in patient safety, including medication errors, wrong-site surgery, patient deaths, delays the course of treatment, patient dissatisfaction, and prolonged hospital stay. Handover communication is basic for health care providers; the aim of handover should achieve safe, effective, comprehensive and high quality communication during the transitions of patients’ care (Malekzadeh et al., 2017).

Shift handover is a common tradition among nurses; however, standard and effective handover and information communication skills are not taught formally during nursing academic education; rather, nurses learn such skills during their daily performance and from more experienced nurses (Jukkala, 2020). So, the researcher seek to improve the knowledge and performance of critical care nurse by developing a training program regarding iSoBAR shift report to improve nurse’s handover shift report.

The aim of the study is to determine the effect of implementing a training program of iSoBAR shift report on nurse's handover shift report in critical care units, at El Menofia University Hospital, Egypt.

Interpretation and discussion of results obtained from the current study were presented in five main sections; the first section describes the socio-demographic characteristics of the sample. The second section is concerned with the sample knowledge about iSoBAR shift report in critical care units, the third section is concerned with the sample performance toward iSoBAR shift report in critical care units.

Regarding characteristics of the studied nurses, the results of the present study revealed that more than two thirds of the studied nurses were in the age group ranged between 26- ≤ 35 years, with a mean age of (31.94 ± 2.31). This result disagreed with that of *Seada & Bayoumy, (2017)*, who conducted a study entitled "Effectiveness of Handoff Educational Program on Nurses Interns' Knowledge, and Communication Competence" and revealed that, the majority of the studied nurses in all intensive care units with different specialties, which affiliated with Kasralainy hospital, Cairo University were in age group ranged between 22- less than 24 years.

Also, this result was contradicted with that of *Pakcheshm et al. (2020)*, who conducted a study entitled "The impact of using "iSoBAR" standard checklist on nursing clinical handoff in coronary care units" and found that, almost half of the nurses in Afshar Hospital of Yazd were in the age group ranged between 30-39 years, with a mean age of (33.8±7.63).

Concerning gender of the studied nurses, the results of the present study showed that around two thirds were female. This result was consistent with *Abdel Aal et al. (2020)*, who conducted a study entitled "patient safety: Assessing nursing performance During shift handover" and demonstrated that among nurses working in ICUs of Hazrat Rasool Hospital affiliated to Iran University of Medical Sciences, the majority of them were females .

From the researcher's point of view this may be due to the greater proportion of the nurses in Egypt was female and may also related to the studying of nursing in Egyptian universities and institutions were exclusive for females only till few years ago.

This result approved with *Khamaiseh et al. (2020)*, who conducted a study entitled " Patient safety culture in Jordanian primary health-care centers as perceived by nurses" and found that, almost two fifths of nurses working in intensive care units were females.

Concerning job title of the studied nurses, the results of the present study showed that most of the studied nurses were staff nurse. This result accepted with *Inanloo et al., (2017)*, who conducted a study entitled "The effect of shift reporting training using the iSoBAR tool on the performance of nurses working in intensive care units" and demonstrated that the majority of them were staff nurse.

Regarding working unit, results of the current study indicated that more than one third of the studied nurses were working in a Medical Intensive care units. This result agreed with that of *Rafü, et al., (2017)*, who conducted a study entitled "The Effect of Shift Reporting Training Using the iSoBAR Tool on the Performance of Nurses" and indicated that more than one third of the studied nurses were working in a Medical Intensive care units.

Regarding education level and experience years, this study revealed that almost three fifths of the studied nurses had associate degree in nursing and nearly half of them had 3- ≤ 7 years of experience, with a mean 8.45 ± 2.30 years respectively. This result disagreed with those of *Ito, & Iijima, (2018)*, who found that the majority of the nurses working in Intensive care units had bachelor of nursing science, and had 3 to 5 years' experience.

Also, this result disagreed with those of *El-Gendi, Seung, Abdelsamie and, Feemster, (2017)*, "who conducted a study entitled" Assessment of Patient Safety Culture among Egyptian Healthcare Employees" and showed that all ICU nurses had a bachelor degree in nursing science.

An effective handover supports the exchange of important information and continuity of care and treatment. However, the ineffective handover can leads to gaps in patient care and breaches in patient safety, including medication errors, wrong-site surgery, patient deaths, delays the course of treatment, patient dissatisfaction, and prolonged hospital stay. Handover communication is basic for health care providers; the aim of handover should achieve safe, effective, comprehensive and high quality communication during the transitions of patients' care (*Malekzadeh et al., 2017*).

The nurse's knowledge and understanding of the effective handover are important for the nurse in order to provide safe, effective, comprehensive and high quality patients' care (*Jukkala, 2020*).

Concerning nurses knowledge regarding communication pre/post training program, results of the current study revealed that there was a marked improvement in nurses' knowledge about communication post/ follow up implementation of a training program as more than two thirds of the studied nurses had incorrect knowledge related to the definition, principles, elements and methods of verbal communication preprogram compared with the most of them had correct knowledge post-program and follow up implementation respectively, with highly statistically significant difference.

This result consistent with those of *Abdelwahi & Attia, (2020)*, who conducted a study entitled "Effect of iSoBAR Training Program on Baccalaureate Nursing Students' Self-Confidence in Shift Reporting" and showed that there was highly statistically improvement in nurse's knowledge regarding iSoBAR communication immediately after training program implementation and follow up. From the researcher's point of view, this improvement may be due to that completion of iSoBAR communication training program.

The findings of the present study cleared that, there was a marked improvement in nurses' knowledge about iSoBAR shift report post implementation and follow up of a training program as the majority of the studied nurses had incorrect knowledge related to the definition of report, types of intra-departmental report, definition of iSoBAR shift report and aim of nursing shift report responsible for iSoBAR shift report writing preprogram compared with the most of them had correct knowledge post-program and follow up implementation respectively with highly statistically significant differences.

These results in the same line with *La Torre, et al. (2019)*, who conducted a study entitled "Integrated reporting and integrating thinking: Practical challenges" and reported that, the majority of nurses' knowledge about iSoBAR shift report found generally low before the intervention, and improved after intervention.

With total nurses knowledge about iSoBAR shift report, this study illustrated that there was a marked improvement in total nurses' knowledge about iSoBAR shift report post implementation and follow up of a training program as three quarters of the studied nurses had poor level of total knowledge pre-program compared with the majority and around three quarters of them had good level of total knowledge post-program and follow up implementation, with a highly statistically significant difference.

From the researcher's point of view, the finding of the present study interpreted that, implementing a training program regarding iSoBAR shift report was effective in increasing the level of nurse's knowledge regarding handover shift report. This result was in agreement with *Müller et al., and Herawati et al. (2018)*, who conducted a study entitled " Impact of the communication and patient hand-off tool iSoBAR on patient safety" and discovered that health worker' knowledge increases after the iSoBAR training.

The previous result supported by those of *Randmaa et al. (2019)* and *Fitria, (2017)*, who found that health workers' knowledge about the iSoBAR communication significantly improves after the second and fourth week of the training. The implementation of the iSoBAR communication is greatly influenced by the knowledge of the nurses.

According to *Suardana et al, (2018)*, and *Vega-Encabo, (2016)*, who proclaimed that, ineffective iSoBAR communication is influenced by several factors, such as knowledge, education, and age of nurses. This statement means that the successful implementation of iSoBAR highly depends on the knowledge of the nurse associates. From the researcher's point of view, it can be concluded that knowledge greatly influences the ability to apply iSoBAR communication. As the knowledge refers to a person's point of view on something as the perception produced by the five senses that affect his ability to understand a problem.

Regarding nurses organizing hand-over process before the time of hand-over pre/post training program, finding of the present study illustrated that, there was a marked improvement in nurses' performance regarding to organizing hand-over process before the time of hand-over post implementation of a training program as the most of the studied nurses had unsatisfactory performance regarding organization of hand-over process before the time of hand-over pre-program as compared with the most of them had satisfactory performance regarding organization of hand-over process before the

time of hand-over post-program and follow up implementation, with highly statistically significant difference. From the researcher's point of view, this may be due to increase awareness about the iSoBAR shift report-training program.

The current study cleared that, there was a marked improvement in nurses' performance regarding to process of hand-over post and follow up implementation of a training program as most of the studied nurses had unsatisfactory performance regarding the process of hand-over preprogram compared with the most of them had adequate performance regarding the process of hand-over post-program and follow up implementation, with highly statistically significant difference.

These results consistent with that of *Biondi, Dumay, & Monciardini, (2020)*, who found that the no one of nurses had satisfactory performance during hand-over procedure before the intervention. Also, this result was in agreement with *Buus, Hoeck & Hamilton, (2017)*, who reported that majority of nurses had satisfactory performance during hand-over procedure after the intervention.

The present study revealed that, there was a marked improvement in nurses' performance regarding to ensuring exchange and follow up shift report contents post & follow up implementation of a training program as majorities of the studied nurses had unsatisfactory performance regarding ensuring exchange and follow up shift report contents preprogram, compared with the most of them had satisfactory performance regarding ensuring exchange iSoBAR shift report contents post-program and follow up implementation with highly statistically significant difference.

According to *Randmaa et al., (2019)*, who conducted a study entitled " iSoBAR improves communication and safety climate and decreases incident reports due to communication errors in an anesthetic clinic" and showed that using iSoBAR communication tool has been very effective in improving the level of patient's safety, reducing the time spent on shift delivery of nurses, and improving nurses' professional relationships. According to *Cornell et al. (2019)*, who conducted a study, entitled "Impact of iSoBAR on nurse shift reports and staff rounding" and showed the same result.

Considering total nurse's performance regarding iSoBAR shift report pre/post training program, in the current study there was a marked improvement in total nurses' performance towards iSoBAR shift report post implementation & follow up of a training program as the vast majority of the studied nurses had unsatisfactory level of total performance regarding iSoBAR shift report pre-program compared with the majority and three quarters of them had satisfactory level of total performance post-program and follow up implementation, with a highly statistically significant difference.

This result congruent with those of *Ramya et al. (2017)*, who conducted a study entitled " Hand me an isobar method of clinical handover and level of safe nursing performance among nurses working in ICU" and confirmed the positive effect of iSoBAR training program on the improvement of nurse's knowledge and performance regarding hand-over in the intensive care unit.

With regard to the evaluation of iSoBAR method, *De Meester et al. (2013)*, reported that using iSoBAR tool considerably reduced the rate and report of incidents caused by inappropriate connection and weak relationship of physician and nurses from 31% to 11% after the intervention, which like our study, referred to the effectiveness of the iSoBAR method-training program.

As regards the relation between nurse's characteristics and their total knowledge, the present study noticed that there were highly positive relation between nurse's characteristics namely education level, job title and their total knowledge regarding iSoBAR shift report at pre implementation of a training program.

This result in the same line with *Randmaa et al. (2019)*, who found that there were highly positive relation between nurse's characteristics and their total knowledge regarding iSoBAR shift report at pre implementation of a training program.

As regards the relation between nurse's characteristics and their total knowledge, the present study noticed that there were highly positive relation between nurse's characteristics namely education level, experience years and their total knowledge regarding iSoBAR shift report. Also, there were positive relation between nurses characteristics namely age & job title and their total knowledge regarding iSoBAR shift report post program and follow up implementation. This result was argued with *Abdel Aal, (2016)*, who indicated that there were negative relation between total nurses' knowledge regarding shift report handover and personal characteristics.

As regards the relation between nurse's characteristics and their total knowledge, the present study noticed that there were highly positive relation between nurse's characteristics namely education level, job title, experience year and their total

knowledge regarding iSoBAR shift report at follow-up implementation of a training program. Also, there were positive relation between nurses characteristics namely age and their total knowledge regarding ISOBAR shift report at follow-up implementation of a training program.

This result in the same line with *Randmaa et al. (2019)*, who found that there were highly positive relation between nurse's characteristics and their total knowledge regarding ISOBAR shift report at follow-up implementation of a training program.

As regards the relation between nurse's characteristics and their total performance, the present study noticed that there were highly positive relation between nurse's characteristics namely education level & experience years & job title and their total performance regarding iSoBAR shift report at pre implementation of training program. Also, there were positive relation between nurses' characteristics namely age and their total performance regarding iSoBAR shift report at pre implementation of training program.

This result argued with *Santhirani et al. (2017)*, who indicated that there were negative relation between nurse's characteristics and their total performance regarding iSoBAR shift report at pre implementation of training program.

As regards the relation between nurse's characteristics and their total performance, the present study noticed that there were highly positive relation between nurse's characteristics namely education level & experience years and their total performance regarding iSoBAR shift report. Also, there were positive relation between nurses characteristics namely age & job title and their total performance regarding iSoBAR shift report post program and follow up implementation. This result was argued with *Edwards, (2016)*, who reported that there was negative relation between nurse's characteristics and their total performance regarding iSoBAR shift report after training program.

In our country, work shift delivery report is performed orally and using the nursing kardex and memories of the nurse responsible for the patient's care and without following a uniform and standard instruction. Nursing care is very complex and vital in Intensive Care Units (ICUs) and communicating information using common methods is very challenging and difficult. Unfortunately, nurses do not follow a systematic and integrated approach for their reports. Accordingly, one of the problems and challenges of work shift reporting is the poor communication of information among the nurses (*Etezadi et al., 2019*).

Taking into consideration the consequences of poor transmission of information regarding clinical consequences for patients, so we need to raise awareness of the healthcare system and especially the health team regarding the new standard related to the effective hand over shift report. The researcher used these standards to improve the knowledge and performance of nurses working in the intensive care unit regarding the hand over shift report. The results showed that the training program significantly positively affects the nurse's knowledge and performance regarding the hand over shift report. This intervention helped nurses learn and adopt a new standard related to effective hand over shift reporting.

## V. CONCLUSION

### Findings of the present study concluded that:

- The most of the nurses under study responded positively to the effect of the iSoBAR shift report training program sessions on their knowledge and performance as the implementation of the planned iSoBAR shift report training program was significantly effective as a method to improve the knowledge and performance of critical care nurses as regards nurse's handover shift report.
- There were highly significant positive correlation ( $P < 0.01$ ) between total nurses knowledge and their total performance regarding iSoBAR shift report post program and follow up implementation.
- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' knowledge at pre implementation of a training program and their socio-demographic characteristics as education level and job title.
- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' knowledge at immediate post implementation of a training program and their socio-demographic characteristics as education level and experience years.

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- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' knowledge at follow-up implementation of a training program and their socio-demographic characteristics as education level, job title and experience years.
- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' performance at pre implementation of a training program and their socio-demographic characteristics as education level, experience years and job title.
- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' performance at immediate post implementation of a training program and their socio-demographic characteristics as education level and experience years.
- There were highly statistically significant relation ( $P < 0.01$ ) between total nurses' performance at follow-up implementation of a training program and their socio-demographic characteristics as education level, experience years and job title.
- There were highly significant positive correlation ( $P < 0.01$ ) between total nurses' knowledge and their performance towards iSoBAR shift report at pre implementation of a training program.
- There were highly significant positive correlation ( $P < 0.01$ ) between total nurses' knowledge and their performance towards iSoBAR shift report at immediate post implementation of a training program.
- There were highly significant positive correlation ( $P < 0.01$ ) between total nurses' knowledge and their performance towards iSoBAR shift report at follow-up implementation of a training program.

## VI. RECOMMENDATIONS

**Based on the study results, the following recommendations can be given:**

### ➤ At nursing personnel level:

- Training programs for nurses and nursing students about standard handoff and related tools such as iSoBAR in hospitals and universities.
- Continuous in-service training program should be held for critical care nurses about standardized shift handover protocols.

### ➤ At the organizational level:

- Raise awareness of the policymakers regarding importance of implementing the iSoBAR communication techniques to create better hospital services
- Replication of the study on a larger sample and in different geographical areas in Egypt is recommended for generalization of findings.

### ➤ At the educational level:

- Healthcare facilities and educational institutions should adopt the use of the iSoBAR and provide continuous instructions for the iSoBAR tool throughout the curriculum includes specific applications at each student's level.
- Developing strategies to enhance the use of iSoBAR during all patient related communication among health care providers.

### ➤ At the research level:

- A study to assess attitude of critical care nurses regarding iSoBAR shift report training program.
- Future researches with larger sample sizes and multiple settings are recommended to substantially evaluate the effectiveness of iSoBAR shift report training program on nurse's handover shift report.
- More studies to investigate the effects of standardized shift handover protocols on nurses' satisfaction and nursing error incidence rate in other caring units is recommended.

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