



## Effectiveness of Educational Program on Nurses' Knowledge and Performance Regarding Shift Change Handoff and Its Effect on Continuity of Patient Care

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### ABSTRACT

**Background:** Handoff is a vital step in nursing care, particularly in critical care units, because it involves the transfer of clear and simple patient clinical information that leads to enhanced continuity of patient care. **Aim of the study:** Assess effectiveness of educational program on nurses' knowledge and performance regarding shift change handoff and its effect on continuity of patient care. **Design:** A quasi experimental research design was used to carry out this study. **Setting:** The research was carried out in Intensive Care Units at Benha Teaching Hospital. **Subjects:** All available 48 nurses. **Tools for data collection:** Three tools were used for data collection namely; Handoff Knowledge Questionnaire, Handoff Observational Checklist, Continuity of Care Observational Checklist. **The results showed that,** there was highly statistically significant improvement in nurses' knowledge and performance regarding handoff at post, follow up program than preprogram. Also there was highly statistically significant improvement in level of continuity of care post program, follow up as majority of nurses has satisfactory level of continuity of care (83.3%, 85.4%) compared to preprogram (25.0%). **Conclusion:** Implementing the educational program had a significant effect in improving nurses' knowledge and performance of handoff, as well as total continuity of care during the post-program phase. There was a highly statistically significant positive correlation between total knowledge, total performance regarding handoff, and total continuity of care among nurses post-program scores. **The study recommended that:** Conducting continuous in-service workshops about intradepartmental communication among nurses through hospital continuous training and learning center

**Keywords:** Continuity of patient care, Educational program, Shift change handoff.

### Introduction

Intensive Care Units (ICUs) are healthcare settings for patients in critical conditions that require complex and specialized care delivered by multiprofessional and interdisciplinary teams. This setting is characterized by being dynamic and constant flow of health professionals, the need to manage therapies, information systems, and high-complexity equipment, patient instability. Thus, continuity of patient care deserves special attention, because patients are more vulnerable to adverse events because of the severity of their diseases and the greater need for specific, continued care. (Trobiano, et al., 2018)

The change of shift report is a critical process in which one nurse provides critical clinical information to the next incoming nurse. During this process, critical information about the patient's condition and treatment plan must be accurately communicated. Patient safety and continuity of care are also dependent on communication of patients' status during handoffs. (Young, 2017). Handoffs, Handovers, sign-off and inter-shift reports, nurse-to-nurse change-of-shift handoff, or nurse-to-nurse change-of-shift handoff occur when nurses share related information about their patients to allow continuity of patient care. It's also known as a way of communicating data, primary duty, and authority from one or more nurses to oncoming personnel. In theory, the handoff should provide critical patient information, involve communication mechanisms between sender and

receiver, transfer responsibility for care, and be carried out within complex organisational structures and cultures that affect patient safety and continuity of care. (Margaret, Yvonne, 2015; Campbell, Dontje, 2019). The type of information, communication channels, and various nurses for each of these aspects has an impact on the handoff's effectiveness and efficiency, as well as patient safety (Williams, 2019).

The shift change handoff is a common and routine activity that occurs over the course of 24 hours, including morning, afternoon, and night shifts. During this procedure, vital information about the patient's condition and treatment plan must be transmitted correctly, as patient status communication is critical to patient safety and continuity of care. (Nasarwanji, Badir, Gurses, 2016; Merkel, Zwißler, 2017). Handoff reports, which are viewed as crucial in ensuring continuity of care, delivering quality treatment, and providing safe patient care, are the most common type of communication between nurses. (Shahid and Thomas, 2018).

Communication is patient-centered, effective, and efficient during handoff, and the handoff template has been developed to include critical questions that health workers and client advocates must answer. A bedside report is a method that meets the criteria for safe reporting. (Randmaa, et al., 2016). It is a strategy of satisfying a patient's needs successfully by encouraging constructive participation in care. Patients assist with the reporting process by asking questions and evaluating information such as medical history, treatment plans, and lab findings. A bedside report is also an interactive method that allows nurses to interact directly with a nursing colleague and the patient. Nurses can think critically, confirm outcomes, and undertake brief evaluations to verify information provided during the bedside report. (Ting, 2014; Tobiano, et al., 2020).

Off-going and oncoming nurses handoff have been described in the literature as a technique for ensuring safe continuity of care and the implementation of optimal patient care by sharing vital patient information, responsibility, and accountability. A written report, a tape-recorded report, a verbal face-to-face report delivered in a private location, and a face-to-face bedside handoff are the primary types of nurse reports documented in the literature. Although the written nursing report prevents face-to-face communication between off-going and on-coming nurses, it is a written

record of the patient's medical history, state, treatment, and care plan that is normally completed behind closed doors. (Lee, et al., 2016, Rossell, 2018).

The off-going and on-coming nurses, as well as the tape-recorded nursing report, are unable to communicate. It's a time-saving method, but it has downsides, including a nurse's inability to clarify patient information, an unclear or low-volume audiotape recording, and outdated or misheard data pertinent to the patient's current condition. Patients and their families are not included in the verbal report, which is conducted in a private location and allows off-going and oncoming nurses to discuss face-to-face. Furthermore, it takes longer than other reporting formats. One strategy to increase patient safety and satisfaction is to ensure that shift handoff takes place at the bedside with patient participation rather than at the nurses' station. This allows patients and family members to be active participants who can clarify issues. (Fabila et al., 2016).

Nurses are the primary communicators and partners in patient coordination of care, and they have been thought to be the best equipped members of the care team to organise a successful nurse to nurse change - of - shift handoff, which includes the oncoming and outgoing nurses trying to visualize the patient together, reviewing medication records and physician and nursing orders, and trying to establish the patient shift report. During handover, the incoming staff nurse and exiting staff nurse should stand beside the patient bed and communicate information about the patient. This is critical for patient contact and confidentiality. (Randmaa et al., 2016).

During handoffs, information relevant to the patient's continuity of care should be communicated, including the patient's present health condition, recent changes, and the treatment being administered. During hospitalization, admission, and discharge, it is a means of assigning patient care to another professional team. For communicating patient-specific health care information during handoff, situational awareness, or a comprehension of a patient's current status and clinical advancement, is essential. Loss of situational awareness can have unfavourable consequences, endangering continuity of patient care and safety. (Rezende, Campos & Celestino, 2018).

Continuity of care is concerned with quality of care over time. It is the process by which the patient and physician-led care teams are cooperatively involved in

ongoing health care management toward the shared goal of high quality, cost-effective medical care. Thus, it facilitated by a physician-led, team-based approach to health care. It reduces fragmentation of care and thus improves patient safety and quality of care (Ebd-Alrahman, 2018).

Additionally, during handoff, precise and straightforward transfer of patient clinical information from one health care professional to another ensures continuity of care. In order to provide safe patient care, effective communication is essential. In a health-care context, a breakdown in communication could result in significant medical blunders. Situational awareness is required when sharing patient-specific health care information during handoff. The majority of patient-care communication takes place between nurses and physicians in the hospital setting. Differences in training and reporting expectations aren't the only barriers to communication among health care practitioners. (Nogueira&Rodrigues, 2015).

Since, health care has evolved and grown more specialized, with greater numbers of professionals engaging in patient care, patients in critical care units are likely to experience more handoffs than in the simpler and less sophisticated health care delivery system of a few generations ago. Ineffective handoffs can result in gaps in patient care as well as patient safety breakdowns (i.e. failures), such as medication errors and patient death. Clinical settings are dynamic and complex, presenting a number of challenges to effective communication between health care providers, patients, and their families. Some hospitals "transfer or release 40 percent to 70 percent of their patients every day," leaving ill patients in the hospital. (McCarthy, 2019).

### Significance of the study

Effective communication among health care professionals is challenging in dynamic and complex clinical situations. The failure of healthcare professionals to communicate accurately, timely, and easily available important information raises the risk of patient injury and can have devastating impacts for patient care especially at intensive care unit. Furthermore, communication breakdowns among healthcare staff are well-known dangers to patient safety, contributing for more than 60% of the causative factors of sentinel incidents reported to The Joint Commission. Working will continue 24 hours a day, seven days a week at health care intensive care unit; a team of nurses is required to provide round-the-clock patient care, and this procedure necessitates the transfer

of patient care responsibilities. A "handoff" occurs at least twice or three times a day among a team of nurses (Forde, Coffey, 2020).

In the United States, for example, it is claimed that 80 percent of significant medical errors are due to a breakdown in communication during handoff. In Egyptian studies (Dorgahm, and Obied, 2021) concluded that (77%) of nurses were dissatisfied with the current handover process. (30%) reported they experienced error during handover process due to ineffective communication.

The interdisciplinary healthcare team, especially in the critical care unit, faces a challenge in improving patient safety and continuity of care for critically sick patients. If adverse events occur, they must be properly documented through hospital reporting systems so that staff may learn from them, devise remedies, and, most importantly, exchange best practices and, if required, establish new national guidelines. As a result, sustaining staff engagement for extremely good communication during shift change handoff and promote continuity of patient care involves everyone working together, supporting one another, and providing training. So, this study was conducted to assess the effectiveness of educational program on nurses' knowledge and performance regarding shift change handoff and its effect on continuity of patient care.

### 1.2 Aim of the Study

This study aimed to assess the effectiveness of educational program on nurses' knowledge and performance regarding shift change handoff and its effect on continuity of patient care.

### 1.3 Research Hypothesis:

1. It was hypothesized that an implementation of educational program will lead to significant improvement of nurses' knowledge and performance regarding shift change handoff
2. It was hypothesized that an implementation of educational program will have a positive effect on continuity of patient care.

## II. Subjects and Method

### 2.1. Research Design:

A quasi experimental research design with one group pre and posttest assessments was used in conducting the present study.

## 2.2. Setting:

The study was conducted at Benha Teaching Hospital in Critical Care Units. Benha teaching hospital composed of three separating buildings; first was main building had inpatient medical, surgical, intensive care units, second was hemodialysis building, and third was emergency and outpatient building. The Intensive Care Units which included in the study were General Intensive Care Unit, Pediatric & Neonatal Care Unit, and Emergency Care Unit. Bed capacity of Intensive care units was 20 beds. It provides free and economic services for all patients.

## 2.3. Subjects:

All 48 nurses available from the presented units who are responsible for providing direct patient care in intensive care units; 24 nurses from the General Intensive Care Unit, 12 nurses from the Pediatric & Neonatal Care Unit, and 12 nurses from the Emergency Care Unit, regardless of their inclusion criteria.

## 2.4. Tools of Data Collection:

Three tools were used to collect the study data.

### 2.4.1. Handoff Knowledge Questionnaire:

It was developed by the researchers based on review of related literature (Horwitz, et al., 2013; Wheeler, 2015; Marquis and Huston, 2016; Ayala, 2017 and Young, 2017). It was aimed to assess nurses' knowledge about nurse to nurse handoff. It consisted of two parts:

**Part (1):** Contained items related to personal characteristics of the study subjects (age, gender, marital status, educational qualification, years of experience, and previous training about handoff). **Part (2):** It included 29 questions; 19 multiple-choice questions and 10 true and false questions related to nurses' knowledge about nurse to nurse handoff as concept, benefits, and methods of handoff.

#### Scoring system:

Nurses' responses were given (1) for correct answer and (0) for wrong answer. The maximum total score was 29; the total scores were converted into percentages. The total level of knowledge was considered

poor if the percent score less than 60% (0-17), average if the percent score 60% - 75% (18-21) and good if the percent score more than 75% (22-29) (Elsayed, 2013).

### 2.4.2. Handoff Observational Checklist:

It was developed by the researchers after reviewing of relevant literature (Elsayed, 2013; Soliman, 2014; Ho, 2016; Obioma, 2017; Akhu-Zaheya, Al-Maaitah, & Bany-Hani, 2018). It was used to observe and assess level of nurse-to-nurse handoff communication performance during shift report. This tool was consisted of 38 items divided into two main sections (1) nurse-to-nurse written communication during handoff (20 items) to assess the written preparation and completeness of handoff report as (Write report by readable handwrite), (2) nurse-to-nurse oral communication during handoff (18 items) to assess the methods and conditions of reporting handoff report as (Exchange the content of the report beside the patient bed).

#### Scoring system:

Each item of observational checklist was scored as the following: (1) was given when observed item "Done" and (0) when the item was "Not done". Total score was calculated by summing up- the grades of items of checklist and the total possible scores were ranged from 0-38. The scores were converted into percent scores. The level of performance was determined as satisfactory performance if the score equal to and more than 75% (29-38), unsatisfactory performance if the score less than 75% (0-28). (Elsayed, 2013).

### 2.4.3. Continuity of Care Observational Checklist:

It was developed by researchers based on related literature (Elsayed, 2014; Mekawy, 2017; Abd-Elrahman, 2018; Abd El-Hamed, 2020) to assess the continuity of patient care as performed by nurses. It consisted of (26) items grouped under main six categories disturbed as follow: Vital signs (4) items, Medication order (4) items, Fluid chart (4) items, Laboratory investigations (4) items, Abnormal assessment data (4) items, and Documentation (6) items.

#### Scoring system

Nurses` performance was scored as follow three points for "measured and recorded" two points for "measured not recorded" and one point for "not measured but recorded" and zero for "not measured and not recorded". Total nurses performance score was ranges from (0-78).The nurse who had a percent more than 75% (59-78) this indicated done and record satisfactory level of continuity of care. The nurse who had a percent less than 75% (0-58) this indicated done and record unsatisfactory level of continuity of care (Abd-Elrahman, 2018).

## 2.5. Tools Reliability and Validity:

The researcher developed and translated the content of the three instruments into Arabic, and the content validity was assessed by five expert juries: three assistant professors of nursing administration and two professors of medical and surgical nursing from Faculty of Nursing, Benha University, who revised the tools for clarity, relevance, applicability, comprehensiveness, understanding, and ease of implementation, and minor changes were made based on their feedback. The values of content validity for tool I, tool II, tool III (93.14%, 85.71%, and 89.52%) respectively.

Cornbrash's Alpha test was also used to assess the instruments' consistency and homogeneity. The internal consistency of the Handoff Knowledge Questionnaire, Handoff Observational Checklist, Continuity of Care Observational Checklist was (0.92, 0.89, 0.94) respectively.

## 2.6. The Pilot Study

A pilot research was done on 10% of the study sample (5 nurses) to assess the clarity and validity of the study instruments' content, add or remove questions, and determine the time required to complete each questionnaire. There were no changes made, and pilot study participants were included in the main subjects.

## 2.7. Approval:

Official permission to conduct the study at the selected setting was obtained from hospital authorities at Benha Teaching Hospital.

## 2.8. Ethical Consideration

The scientific research committee of Benha University's Faculty of Nursing granted ethical

permission prior to the study's implementation. All participants were interviewed to explain the study's objectives and methods, and they were given the option to withdraw at any time during the study. Furthermore, all data was coded to preserve the subjects' confidentiality and anonymity.

## Field Work

The study was carried out for (7 months) from the beginning of September, 2021 to the end of March, 2022 as the following:

- Assessment phase (Initial assessment): The preprogram tests were fulfilled before beginning of the educational program. Pre program assessment was done by collecting data using Handoff Knowledge Questionnaire which took about 15–20 minutes to be completed, and 25-35 minute for completing Handoff Observational Checklist and 25–30 minutes for completing Continuity of Care Observational Checklist. And pre mentioned observational checklists were used three times for each nurse at each program phase during shift handoff and take mean of the three observations. This pre-study test was designed to allow the researchers collect a baseline assessment of nurses' knowledge, performance regarding handoff and level of continuity of care in order to prepare educational handout about handoff. The data collected three days/week in the morning and afternoon shifts during September, 2021.

- Pre-implementation phase (planning): Took about one month October, 2021. Teaching materials were prepared and the training strategy was developed based on the pre detected needs. As well, time schedule, teaching sessions, media included, and the handout were prepared. Contents of the program sessions were as follows: Introduction of handoff and related different concepts (1st session), methods and tools of communication handoff (2nd session), nursing documentation regarding shift change handoff (3rd session) and nursing documentation ethics (4th session).

- Implementation phase (intervention): Was carried out during November, 2021. Firstly, nurses were divided into (4) small groups each group (12 nurses) according to their units workload.

- The educational program was implemented by the researchers. The educational program has taken 8 hours for each group distributed as the following; 4 sessions, 2hour/session, 2days/week in the morning and afternoon shifts, as two groups were take program in the day. Each group perceived the program content using the same teaching strategies and handout. Different methods of teaching were used such as lectures, group discussion, and

brainstorming. Instructional media included handout prepared by the researchers and distributed to all participants in the first day of implementing the program.

• Evaluation phase: During December 2022, the effect of educational program was evaluated; it was carried out immediately after the program implementation by collecting data using the same pre mentioned study tools; Handoff Knowledge Questionnaire, Handoff Observational Checklist and Continuity of Care Observational Checklist. Observational checklists were used three times for each nurse during shift handoff and take mean of the three observations. And evaluation three months follow up program implementation was carried out during March, 2022 by using the pre mentioned study tools of data collection

**Statistical Analysis**

Analysis of data was carried out by the researcher, Data was verified prior to computerized entry and categorized, coded, computerized, tabulated using IBM SPSS (statistical package for social science) statistical software version (26). Descriptive statistics were applied (e.g., frequency, percentages, mean, and standard deviation). Test of significance Chi- square " $\chi^2$ " and correlation coefficient (r) were used. A significant level value was considered when  $p < 0.05$  and A highly significant level value was considered when  $p < 0.01$ . No statistical significance difference when  $p > 0.5$ .

**Results**

**Table (1):** Showed that there was more than half of nurses (52.1%) had age from 25 to less than 35 years old with a mean age of (34.189±5.241) years. While the highest percent of them (68.7%, 85.4%) were females and married respectively. As regarding to educational qualification, less than half of nurses (47.9%) had B.Sc. Nursing. According to

**Table 1: Distribution of the personal characteristics (n =48).**

| Personal Characteristics | No                  | %    |
|--------------------------|---------------------|------|
| <b>Age (years)</b>       |                     |      |
| < 25                     | 7                   | 14.6 |
| 25 <35                   | 25                  | 52.1 |
| 35 <45                   | 12                  | 25.0 |
| ≥ 45                     | 4                   | 8.3  |
| <b>Mean ±SD</b>          | <b>34.189±5.241</b> |      |
| <b>Gender</b>            |                     |      |
| Male                     | 15                  | 31.3 |

years of experience, 47.9% of staff nurses had years of experience from 5 to less than 10 years with a mean year of experience (8.124±3.457). And (16.7%) of them had training about handoff.

**Figure (1):** Illustrated that there was highly statistically significant improvement in nurses` knowledge scores regarding handoff at post program, follow up program as majority of them had good knowledge (81.3%, 77.1%) than preprogram (33.3%).

**Table (2):** Clarified that that there was highly statistically significant improvement in nurses` performance scores regarding handoff at post, follow up program as majority of them had satisfactory performance (79.2%, 81.3%) than preprogram (37.5%).

**Figure (2):** Illustrated that there was highly statistically significant improvement in level of continuity of care immediate post, follow up program as majority of nurses has satisfactory level of continuity of patient care (83.3%, 85.4%) compared to preprogram scores (25.0%).

**Table (3):** Demonstrated that there was a positive highly statistically significant correlation between level of handoff knowledge, performance, and continuity of patient care attitude and experience, educational qualification of studied nurses during post program phase.

**Table (4):** Clarified that there was a positive highly statistically significant correlation between nurses' level of knowledge and performance toward handoff immediate post program. Also, that there was a positive highly statistically significant correlation between level of performance and level of continuity of patient care post program.

studied nurses according to their

|  |                    |      |
|--|--------------------|------|
| Female                                 | 33                 | 68.7 |
| <b>Marital status</b>                  |                    |      |
| Married                                | 41                 | 85.4 |
| Unmarried                              | 7                  | 14.6 |
| <b>Educational qualification</b>       |                    |      |
| Nursing diploma                        | 13                 | 27.1 |
| Technical institute                    | 12                 | 25.0 |
| B.Sc. Nursing                          | 23                 | 47.9 |
| <b>Years of experience</b>             |                    |      |
| 1 < 5                                  | 4                  | 8.3  |
| 5 < 10                                 | 23                 | 47.9 |
| 10 < 20                                | 15                 | 21.3 |
| ≥ 20                                   | 6                  | 12.5 |
| <b>Mean ±SD</b>                        | <b>8.124±3.457</b> |      |
| <b>Previous training about handoff</b> |                    |      |
| Yes                                    | 8                  | 16.7 |
| No                                     | 40                 | 83.3 |

Figure (1): Frequency distribution of nurses regarding their total handoff knowledge levels during different periods of assessment (n=48).



Table (2): Distribution of handoff performance among nurses levels during different periods of assessment (n =48).

| Handoff performance  | Pre-program (mean of three observations) |       | Post-program (mean of three observations) |       | Follow up program (mean of three observations) |       | χ <sup>2</sup> | P value |
|--|--|-------|---|-------|--|-------|----------------|---------|
|  | No                                       | %     | No  | %     | No   | %     |                |         |
| <b>Nurse to nurse written communication during handoff</b> |  |       |   |       |  |       |                |         |
| <b>1- Preparedness of the written handoff report</b>       |  |       |   |       |  |       |                |         |
| Satisfactory   | 17                                       | 35.4% | 42  | 87.5% | 41   | 85.4% | 60.44          | 0.000** |
| Unsatisfactory   | 31                                       | 64.6% | 6   | 12.5% | 7  | 17.6% |                |         |
| <b>2- Content of written handoff report</b>                |  |       |   |       |  |       |                |         |
| Satisfactory   | 9  | 18.7% | 39  | 81.3% | 42   | 87.5% | 45.42          | 0.000** |
| Unsatisfactory   | 39                                       | 81.3% | 9   | 18.7% | 6  | 12.5% |                |         |

|   |    |        |    |       |    |       |       |         |
|---|----|--------|----|-------|----|-------|-------|---------|
| <b>3- Total nurse to nurse written communication during handoff</b> |    |        |    |       |    |       |       |         |
| Satisfactory  | 22 | 45.8%  | 45 | 93.7% | 43 | 89.6% | 55.25 | 0.000** |
| Unsatisfactory  | 26 | 54.2%  | 3  | 6.3%  | 5  | 10.4% |       |         |
| <b>Nurse to nurse oral communication during handoff</b>             |    |        |    |       |    |       |       |         |
| <b>1-Methods and conditions of oral handoff</b>                     |    |        |    |       |    |       |       |         |
| Satisfactory  | 10 | 20.8%  | 35 | 72.1% | 39 | 81.3% | 56.23 | 0.000** |
| Unsatisfactory  | 38 | 79.2%  | 13 | 27.9% | 9  | 18.7% |       |         |
| <b>2- Content of oral handoff report</b>                            |    |        |    |       |    |       |       |         |
| Satisfactory  | 8  | 16.67% | 41 | 85.4% | 42 | 87.5% | 49.57 | 0.000** |
| Unsatisfactory  | 40 | 83.33% | 7  | 17.6% | 6  | 12.5% |       |         |
| <b>3- Total nurse to nurse oral communication during handoff</b>    |    |        |    |       |    |       |       |         |
| Satisfactory  | 15 | 31.3%  | 43 | 89.6% | 38 | 79.2% | 60.46 | 0.000** |
| Unsatisfactory  | 33 | 68.7%  | 5  | 10.4% | 10 | 20.8% |       |         |
| <b>Total handoff performance</b>                                    |    |        |    |       |    |       |       |         |
| Satisfactory  | 18 | 37.5%  | 38 | 79.2% | 39 | 81.3% | 85.25 | 0.000** |
| Unsatisfactory  | 30 | 62.5%  | 10 | 20.8% | 9  | 18.7% |       |         |

Figure (2): Distribution of nurses according to levels of continuity of patient care during different periods of assessment (n=48)



Table (3): Correlation between handoff knowledge, performance and continuity of patient care among nurses and their personal characteristics during post program.

| Variables                               | Personal characteristics of nurses |         |                           |         |
|---|------------------------------------|---------|---------------------------|---------|
|   | Years of experience                |         | Educational qualification |         |
|   | r                                  | P value | r                         | P value |
| Handoff knowledge post program          | 0.389                              | 0.003** | 0.470                     | 0.000** |
| Handoff performance post program        | 0.507                              | 0.000** | 0.519                     | 0.000** |
| Continuity of patient care post program | 0.497                              | 0.000** | 0.431                     | 0.000** |

**Table (4): Correlation between handoff knowledge, performance and continuity of patient care among nurses during post program.**

| Variables                               | Handoff knowledge post program |         | Handoff performance post program |         | Continuity of patient care post program |         |
|---|--------------------------------|---------|----------------------------------|---------|---|---------|
|   | r                              | P value | r                                | P value | r                                       | P value |
| Handoff knowledge post program          | -                              | -       | 0,633                            | 0.000** | 0,761                                   | 0.000** |
| Handoff performance post program        | 0,633                          | 0.000** | -                                | -       | 0,379                                   | 0.000** |
| Continuity of patient care post program | 0,761                          | 0.000** | 0,379                            | 0.000** | -                                       | -       |

## Discussion

Nursing care provision must continue 24 hours a day, seven days a week at healthcare institutions, particularly critical systems such as intensive care units. To provide round-the-clock patient care, a team of nurses is required, and this procedure necessitates the transfer of patient care duties, often known as a "handoff. (Zou, Zhang, 2016). The most prevalent kind of communication between nurses is handoff reports, which are seen as critical in ensuring continuity of care and delivering safe patient care. The purpose of the handoff is to transmit important client information so that safe and ongoing care may be provided. (Shahid and Thomas, 2018).

Efficient communication among health care practitioners is difficult in complex and dynamic healthcare settings. The failure of health care professionals to deliver accurate, timely, and easily available critical information raises the risk of patient injury and can have catastrophic outcomes for patient care. An efficient nurse handoff facilitates the systematic transfer of accurate, timely, and vital patient information, as well as care and treatment continuity, resulting in improved patient safety.

The current study was aimed to assess the effectiveness of educational program on nurses' knowledge and performance regarding shift change handoff and its effect on continuity of patient care.

The current study found that nurses' knowledge levels improved significantly in the immediate post-program follow up phase compared to the pre-program phase. In the immediate post-program phase, the largest

percentage of nurses got good scores. This might be the educational program succeeded in improving nurses' knowledge about handoff also, the educational process is a major element in increasing job performance as a consequence of gaining knowledge and skills, and nurses have the motivation and capacity to improve their performance.

This finding matched with (Thaeter, et al. 2018), who showed that knowledge dramatically altered and improved following the handover teaching and training programme, resulting in a decrease in information omission and improved handover quality. Also, (Elhanafy, Hammour, 2014), who discovered a significant difference in nurses' handoff knowledge between pre and post educational sessions, and they added that, inadequate handoff of patient information carries significant risks for individual clinicians, their organizations and for their patients. So a Sufficient and relevant information through educational sessions should be exchanged to ensure patient safety and continuity of care.

This result was similar to (Seada and Bayoumy, 2017), who found that there was statistically significant and marked improvement in nurses interns' levels of handoff knowledge dimensions during different periods of assessment for the majority of handoff knowledge dimensions. And (Soliman, 2014), who revealed that there was a general improvement in nurses' knowledge, with two-thirds of the staff nurses surveyed having good knowledge of intradepartmental communication and reporting at the time of the immediate post-educational programme assessment.

In the same line (**Daniel, N-Wilfong, 2014**), who found that participants' knowledge of handoff communication improved after the educational program. Also, (**Smith 2015**) who stated that the handoff workshop improved participants' attitudes, knowledge, and skills, but performance gains declined in the months following training.

Regarding nurse-to-nurse communication during handoff through different phases of the educational program, the present study reported that at pre-program phase less than two thirds of nurses had unsatisfactory practice regarding handoff, meanwhile at immediate post-program, follow up phase more than three quarters of the study subjects had highly satisfactory performance. So it is noticed from these results that, there was general improvement in nurses performance related to communication during handoff according to immediately post educational program assessment.

This result was supported with (**Graham et al., 2013**), who found improved quality of verbal (oral) and written handoffs, better handoff documentation and greater resident satisfaction with handoffs. Also, (**Thaeter, et al. 2018**) reported that as nurses' handoff knowledge and performance improved they were more confident at communicating with health care team and performing verbal and written handovers, as well as using standardized communication tools. Furthermore, they rated handover training as useful and important.

In the same line **Soliman, (2014)**, mentioned that continuing education is along learning process that takes place after the basic nursing education program. It consists of planned learning experiences which are designed to promote the development of knowledge and skills for enhancement of nurse performance. Moreover, these findings supported by **El-Sayed, (2013)** who reported regarding shift report that the performance of staff nurse was satisfactory immediate after the program.

The result of the present study was agreed with this result of **Malekzadeh, et al., (2013)** who found that nurses' scores increased significantly in handoff after the study intervention in terms of patient safety through updating their caring program, maintaining the continuity of care, and improving the quality of inter-shift information communication. Also, **Starmer, et**

**al., (2014)** stated that implementation of a handoff bundle was associated with significant improvements in verbal and written handoff processes. In the same line **Daniel, N-Wilfong, (2014)**, found that participants' knowledge and practice of handoff communication improved after educational sessions. Also, **Elhanafy & Hammour, (2014)** stated that the practice of handoff has gained global attention as an area needing quality improvement due to the high associated patient safety risk.

Also, consistent with **Andreoli et al., (2015)** they showed that there was statistically significant improvement in the nurses' performance about shift handoff from the pretest to posttest. And **Elhanahy & Hammour's (2014)** who reported that there's a significant differences between pre and post educational session of nursing hand off regarding to handoff interventions and nurse perceptions of handoff quality and impact on patient care.

The current study illustrated that there was highly statistically significant improvement in level of continuity of care immediate post, follow up program as majority of nurses has satisfactory level of continuity of care compared to preprogram scores. This might be because the effectiveness of educational program on nurses' knowledge and practice regarding shift change handoff and Also, primary purpose of the shift handoff is to convey essential patient care information and promote continuity of care.

This result was agreed with **Abd El-Hamed (2020)** who showed that the majority of staff nurses had unsatisfactory level of performance regard continuity of care at preprogram while improvement to satisfactory at post program and follow up program evaluation. Also, **Murray, (2016)**, who found that there was significant improvement performance of nurses regarding continuity of patient care on the post training, was far better than that which was on the pre-assessment. In the same line **Elsayed (2014)** who found that all items of continuity of patient care were acceptable among nurses after educational program.

The current study showed that there was a positive highly statistically significant correlation between level of handoff knowledge, performance, and continuity of care and nurses' age, experience, educational qualification of studied nurses during post

program phase. This result might be related to their years of experience, educational qualification which were likely to be more knowledgeable about importance of shift report handoff. This finding agreed with **Nakate, et al., (2015)** who mentioned that there was positive correlation between level handoff knowledge and their personal data of nurses and continuous nursing education on shift report handoff should be done routinely. And supported with **Alsayed (2016)** who stated that there was significant between nurses performance and their personal characteristic due to their experience and level of education

The current study clarified that there was a positive highly statistically significant correlation between nurses' level of knowledge and performance toward handoff immediate post program. Also, that there was a positive highly statistically significant correlation between level of performance and level of continuity of care post program. This can be due to understand by knowledge regarding shift change handoff had a positive effect on performance and continuity of patient care and also due to effective shift report handoff supports the transition of critical information and continuity of patient care and treatment. finally due to achieved goal of nursing handoff educational program is to communicate and exchange accurate, relevant, and up-to-date clinical information about the patient which is necessary for continuity of care.

This finding supported by **Dawod, Ali and Bahaaldeen, (2018)** who they showed that the quality of information associated with the use of SBAR handoff was reported to be good staff nurses, expressed satisfaction with the use of SBAR in handoff and promote continuity of patient care and safety. And consistent with **Taiye, (2016)** reported that highly statistically significant correlation between staff nurses' knowledge and performance toward handoff and level of continuity of care. And **Padgett, (2017)**, who stated that standardizing the communication process during the hand-off process, can contribute to positive change by improving patient safety and continuity of care. Moreover, this finding in the same line with **Elsayed (2014)** who reported that there is a highly statistically significant correlation between level of handoff knowledge, practice, and continuity of patient care.

## Conclusion:

Based on the results of the present study, it can be concluded that: Implementing the educational program had a significant effect in improving nurses' knowledge and performance of handoff, as well as total continuity of patient care during the post-program, follow up phase. There was a highly statistically significant positive correlation between total knowledge, total performance regarding handoff, and total continuity of patient care among nurses post-program scores.

## Recommendations:

The study's findings recommended that:

- 1- Conducting continuous in-service workshops about intradepartmental communication among nurses through hospital continuous training and learning center
- 2- Develop standardized reports format to facilitate communication among nurses and eliminate time waste in nursing documentation.
- 3- More research into the benefits of standardised shift handover protocols on nurse satisfaction and the prevalence of nursing errors in various care settings is needed.
- 4- Future studies with larger sample sizes and several settings are suggested to assess the effectiveness of educational programs on handoff communication skills.

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