

Effect of Implementing Training Program about Handoff on Nurses' Caring Behavior at Children Hospital, Taif, Saudi Arabia

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Abstract:

Background: Effective handoffs not only improve patient safety but also influence nurses' caring behavior, which is central to delivering high-quality, and compassionate care. Effective handoff communication directly supports caring behavior by fostering a shared understanding of patient needs and conditions, and allow nurses to visualize the patient, clarify concerns, and actively involve the patient in their care plan, enhancing both safety and the perception of compassionate caring behavior. **Aim:** to evaluate the effect of implementing training program about handoff on nurses' caring behavior at Children Hospital, Taif-Saudi Arabia. **Method:** A quasi-experimental design with pretest-posttest was utilized at all inpatient departments of Children hospital on 98 staff nurses using three tools for data collection namely, Handoff knowledge questionnaire, handoff observational checklist and Wolf caring behavior questionnaire. **Results:** There was a statistically significant improvement in total nurses' knowledge level about handoff across the training program phases. In pretest phase, total level of nurses' knowledge was at high level (94.3%), and in the immediate post-test and after 3-month follow-up phases were (94.9%), and (95.9%) respectively at high level as well as there was a statistically significant improvement in nurses' levels of handoff performance of the studied nurses pre and post training program. At the pretest phase, it was (54.1%), and improved significantly in the immediate post-test phase to (79.6%), and after 3-month follow-up test phase was (65.3%), there was a highly statistically significant positive correlation between total scores of handoff knowledge and total scores of handoff performance in immediate post-test and after 3 months follow up ($p= 0.0001$). Also, there was a highly statistically significant positive correlation between total scores of handoff Knowledge and total scores of caring behaviors in all phases ($p= 0.0001$), as well as there was a highly statistically significant positive correlation between total scores of handoff performance and total scores of caring behaviors in all three phases ($p= 0.001^*$ & 0.0001^*). **Conclusion:** it was concluded that the implementation of the training program had a significant and sustained positive impact on nurses' handoff knowledge, handoff performance, and caring behavior. **Recommendations:** Participating actively in structured handoff training programs to strengthen knowledge and performance.

Keywords: Caring Behavior, Handoff, Nurses, Implementing, Training Program.

Introduction

Nurses are the backbone of health systems, providing up to 80% of basic health services and consequently being the most crucial group of “frontline workers” in most health systems. Inpatients’ nursing care is outsourced at least 2-3 times every 24 hours among nurses, however nurses are required to always provide proper care. Nurse handoff is therefore an important nursing role. The receiving nurse understands the patient’s condition from the satisfy and style of information communicated by the sending nurse (Do, & Shin, 2024).

As health care has grown more advanced and specialized and more nurses have become involved in the care of the patient, it is expected that patients will involvement more handoffs than did patients in the simpler, less specialized system of health care delivery of previous generations. Communication in healthcare involves the transmission of vital information and the delegation of patient care responsibilities from one healthcare provider to another. This critical transfer point is known as a handoff. A good handoff is the passing on of important information and ensures endurance of care and treatment (Ghasemi, Sadeghi, Jamali, Pourghaznein, & Far, 2025).

The handoff or handover or transfer of care is the procedure of transferring patient information, responsibility and accountability for the care of a patient from one healthcare professional to another. In nursing handoffs occur at shift changes, changes of department or changes in care level. This mode of communication is important as it provides the nurse assuming the patient’s care with enough data regarding the patient’s condition, treatment plan, and any special needs or concerns. Good handoff is important for quality of care, reducing errors, and improving patient safety (Galatzan, Shan, Johnson, & Patrician, 2025).

Critical health care handoffs move patient information, responsibility, and accountability from one physician to another. Good handoffs promote patient safety, continuity, and error reduction. Structured handoffs improve communication and clinician understanding, reducing medical errors and unnecessary adverse events. Shift changes should be communicated to avoid misunderstandings and medication errors. Poor communication is the major source of pharmaceutical errors, requiring consistent clarifying initiatives (Toth et al., 2025).

Poor handoffs are associated with delays in treatment, unnecessary tests, increased fears of malpractice, and increased costs of health care. Inadequate or unclear transfer of information during handoffs has been connected with increased morbidity & mortality. Addressing these shortcomings is significant to improve patient

outcomes and decrease the economic burden on healthcare systems. Effective handoffs face many challenges such as a lack of time to communicate during busy shifts, frequent interruptions that disturb the flow of concentration, inconsistent communication protocols leading to inconsistent transfer of information, and staff lacking sufficient knowledge of the patient's condition or procedures (Vald, Sermet, Chi, & Demir, 2025).

To improve handoffs, strategies include team training, simulation, and technology. Examples of interventions that health care organizations can implement include ongoing training in effective communication techniques, practice using role-playing exercises for structured handoff protocols, and electronic health records (EHRs) to help transfer information. Lack of team work between divisions or hierarchal organizations may hinder transparent communication. However, supportive leadership stimulates collaboration and compliance with standard protocols. Thus, developing a safety and teamwork culture helps nurses to focus on effective communication (Saleh, Pazokian, & Esmaili, 2025).

Effective handovers can improve patient safety and impact on caring behaviors of nurses which are important for delivery of high-quality, compassionate care. Effective handoff communication facilitates compassionate behavior through shared understanding of the needs and situations of the patient. Good and organized handoffs help nurses to provide more individualized, compassionate and attentive care. At the bedside handoffs allow the nurse to see the patient, troubleshoot problems and engage the patient in their care plan increasing safety and the perception of compassionate care (Nilsson, 2025).

Caring behavior in nursing refers to the actions and attitudes exhibited by nurses in caring for the physical, emotional, social and mental welfare of patients. It is considered to be the core of nursing practice, where technical and emotional aspects are interwoven. The technical dimension involves the provision of the physical needs of the patients through clinical skills, therapeutic interventions, and problem-solving while the emotional dimension involves empathy, emotional support, sensitivity to patients' needs, and respect for their privacy (Zoromba, Abousoliman, Zakaria, El-Monshed, & El-Gazar, 2025). Better healthcare services can be provided through compassionate behavior. It boosts trust between nurses and patients, boosts patient satisfaction, and reassures patients all throughout their treatment course. Caring behavior is important in developing patient-centered care that focuses on meeting the physical and psychosocial requirements. Improved caregiving behaviors lead to better patient

outcomes and organizational efficiency (Gharajeh-Alamdari, Dadashzadeh, Tarbiyat, Hedayati, Saemi, & Mirzaei, 2025).

Caring behavior consists of technical care which includes clinical competence such as accurate administration of medicine, monitoring of vital signs, patient education about their diseases and solving medical problems. Expressive care is the provision of emotional support through listening, empathizing, creating trust and being sensitive to the patient's feelings. Respect for privacy, including the confidentiality of patients and respect for their dignity. Therapeutic presence: The patient feels safe and comfortable when the caregiver is present physically and emotionally during the treatment process (Nugraha, Situmorang, & Mukaromah, 2025).

Nurses' ability to exhibit caring behaviors is affected by several factors, such as workload, psychological well-being and cultural background. Heavy workloads can disrupt the delivery of individualized treatment. When leadership does not support nurses, there is less likelihood that nurses will prioritize caring behaviors. Also, caring behaviors are negatively impacted by stress, fatigue, and mental health problems especially during emergency situations like COVID-19. Nurses' cultural background and the characteristics of the hospital setting can also influence their perception of care (Atta, Hammad, & Elzohairy, 2024). Healthcare businesses can promote nurses' compassionate behaviors through training programs, supportive work environments, and stress management strategies. Nurses are better equipped to appreciate the significance of compassionate behaviors from the outset if compassionate behaviors are incorporated into nursing curricula, sufficient staffing, resources and leadership support are supplied, a culture that appreciates patient-centered care is promoted and nurses are able to cope with stress and continue to offer compassionate caregiving during challenging times (Nazari, et al., 2025).

Significance of the Study

When nurses start their shifts they need to handover information, responsibilities and duties to the oncoming nurse. Handoffs are complex and dynamic processes that require excellent communication skills and knowledge of patient information in order to protect patient safety and continuity of nursing care. Liao et al (2025) estimates that 80% of serious patient care errors are caused by carer miscommunication at a patient handoff. The Joint Commission has permitted health care organizations to standardize handoffs to avoid communication problems. Recent reports have indicated that poor handoffs/handovers delay treatment, diagnosis and hospitalization,

making them a high risk factor for patient safety. Therefore, approaches to increase the handover competency of medical professionals are being developed and evaluated (Liao, et al., 2025).

The nurses' caring behaviors influence the well-being and motivation of the patients. Sensitivity, calming, attentive listening and honesty enhance patient satisfaction and quality of care. Research indicates that the caring behaviors of nurses improve patient outcomes and underscore the importance of nursing. These acts are outside the technical competence to offer a conducive environment that fosters healing and patient happiness (Zina, & Helaly, 2025). There is scant documentation on the effects of handoff training programmers on nurses' compassionate behavior. The present study aims to investigate the effect of handoff training on nurses' caring attitude in Children Hospital, Taif, Saudi Arabia.

Research hypotheses

H1. The nurses' knowledge level, performance level regarding handoff, and caring behavior improves after implementing a handoff training program .

Study Design:

A quasi-experimental design with pretest-posttest was utilized in conducting the study (Siedlecki, 2020).

Setting:

This study was conducted at all inpatient departments of Children hospital in Taif.

Participants

A Convenient sample was utilized which include all staff nurses (n=98) who are responsible for providing patients care in all above-mentioned settings and fulfilled the criteria of having at least one-year of work experience and willing to participate in the study.

Tools of data collection:

Tools I: Handoff Knowledge Questionnaire:

It consisted of two parts:

Part I: This part included personal data of the studied staff nurses as age, gender, marital status, educational qualifications, and years of experience.

Part II: It was developed by the researcher based on reviewing related literature (Ghonem, & El-Husany, 2023) and (Galatzan, & Carrington, 2022). To assess staff nurses' knowledge about handoff. It consisted of 15 questions in the form of true and false and multiple choices that related to staff nurse handoff. The questions were scored as "1" for correct answer, and "zero" for incorrect answer.

Scoring system: Knowledge level was classified into three levels based on statistically cutoff point as the following;

- Low level (<60% of total scores),
- Moderate level (60-75% of total scores)
- High level (>75% of total scores).

Tool (II): Handoff Observational Checklist:

It was adopted from El-Guindy, El-Shahate, & Ahmed, (2022). 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 parts (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). 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 scores were calculated by summing up- the grades of items of checklist and the total possible scores ranged from 0-38.

Scoring system: The scores were converted into percent scores, and classified into three levels based on statistically cutoff points as the following;

- Low level (<50% of total scores),
- Moderate level (50-75% of total scores)
- High level (>75% of total scores).

Tool (III): Wolf Caring Behavior Questionnaire

This questionnaire was developed by Wolf, Giardino, Osborne, & Ambrose, (1994) to assess nursing care behaviors. Wolf et al. (2017) reduced the CBI to a 16-item version. The 16-item Caring Behaviors Inventory (CBI) was used in the present study to assess nurses' caring behavior.

The items were answered on a 6-point Likert scale, ranged from 1= never, almost never = 2, sometimes = 3, usually = 4, almost always=5, and always=6 and the total score ranged from 16 to 96. A higher score indicates better caring behavior.

Scoring system: The scores were converted into percent scores, and classified into three levels based on statistically cutoff points as the following;

- Low level (<50% of total scores),
- Moderate level (50-75% of total scores)
- High level (>75% of total scores).

Validity and reliability:

Validity of the instruments were evaluated by five experts in Nursing Administration at Faculty of Nursing, Mansoura University. The experts evaluated the tools for clarity, relevance, applicability, comprehensiveness, comprehensibility and ease of implementation and made necessary modifications. Reliability assessment: Reliability of instrument is assessed by evaluating the extent to which items representing the same construct yield comparable outcomes. Tool I: Handoff Knowledge Questionnaire had reliability coefficient of 0.821, Tool II: Handoff Observational Checklist had a coefficient of 0.801 and Tool III: Wolf Caring Behavior Questionnaire had a coefficient of 0.784.

Pilot study

It was conducted on 10% (n=9) of the randomly selected participants to assess the clarity and applicability of the tools, identify potential obstacles during data collection, and determine the time required for completing the questionnaires. All requisite modifications were implemented, and to identify potential difficulties and issues that may arise during data collection, individuals from the pilot project were excluded from this investigation.

Ethical considerations:

Research Ethics Committee of Mansoura University Faculty of Nursing (Approval No. 550) granted ethical approval. The nominated hospital agreed to data gathering. The signed informed consent of staff nurses who met the inclusion criteria to complete the questionnaires and participate in the study was considered. After explaining the study's purpose to consenting participants, the researcher collected data. Participants were assured anonymity and confidentiality. Participants have the right to join and leave the study at any time.

Data collection process:

1. Preparatory phase: Lasted two months from October to November 2024. The Mansoura University Faculty of Nursing Research Ethical Committee approved. Hospital administration gave permission. The researcher informed participants of the study's purpose and received consent. Based on facts and literature, the training program was created.

2. Phase of implementation:

The Nursing faculty at Mansoura University wrote to the director of the Taif Children's Hospital to authorize the study. After explaining the study's goal, the director of the Children Hospital-Taif gave written authorization to perform the study. Training was implemented by the researcher. The programme lasted one month (January 2025) The programme ran in the morning on Sunday, Monday, and Tuesday. Staff nurses formed four groups. Five 2-hour sessions comprised the 10-hour training programme. The programme had five sessions over three days but was conducted across four weeks by separating participants into four groups. The programme lasted a week for each group. Each group completed the programme in one week:

Pretest:

- The researcher visited with participants individually to discuss study goals and obtain consent. The pretest was completed in 20-25 minutes by staff nurses. Methods of teaching: Lecture, group discussion, and brainstorming were used to instruct one group in the day by the researcher. Educational media included film, data show, and programme booklet provided to study group on first day.

Designing the training programme took around two months, from October to November 2024. Nurses took tests before training. The Research Ethical Committee of Faculty of Nursing, Mansoura University, approved the study, and the hospital administrator gave authorization.

The handoff training programme was developed using statistics and literature to identify important subjects and produce session content. Brainstorming, lectures, films, group discussion, and researcher-prepared handouts were used to instruct.

- The programme has two primary parts: a theoretical learning part covering programme introduction. Handoff concepts and talents. Principles of handoff. Effective handoff traits. The second phase was practical, with nurses given activities and handoff assignments.

- During one shift, the researcher observed each participant three times using the participant observation method. The findings were recorded

in field notes. Participants verbally described these field notes after being followed up.

- The researcher remained present during data collecting for explanation. Data from this phase was the study's pretest.

Results:

Table (1): Personal characteristics of the studied nurses at Children Hospital, Taif - Saudi Arabia. Children Hospital, Taif - Saudi Arabia (n=98).

Personal characteristics	The studied staff nurses (n=98)	
	n	%
■ Age years		
20-<35	65	66.3
35-40	33	33.7
Range	23-40	
Mean± SD	32.08±5.46	
■ Sex		
Male	17	17.3
Female	81	82.7
■ Marital Status		
Single	27	27.6
Married	62	63.3
Divorced	7	7.1
Widowed	2	2.0
■ Experience years		
< 1	3	3.1
1-5	11	11.2
>5-10	42	42.9
>10	42	42.9
Mean±SD	14.88±4.03	
■ Educational level		
Bachelor	81	82.7
Master	10	10.2
PHD	2	2.0
Other	5	5.1

Table (1) showed the personal characteristics of the studied nurses at Children Hospital, Taif - Saudi Arabia. Children Hospital, Taif - Saudi Arabia. It showed that (66.3%) were aged 20-<35 years old, with mean score (32.08±5.46), the majority of them (82.7%) were female, and

nearly two thirds (63.3%) of them were married. Concerning years of experience, (42.9%) had >5-10 and > 10 years of experience with mean score (14.88±4.03), and (82.7%) of them had bachelor's degree.

Table (2): Levels of Handoff Knowledge of the studied nurses at Children Hospital, Taif - Saudi Arabia pre and post training program (n=98).

Handoff Knowledge level (Each item was scored 0-1)	Knowledge level of the studied nurses pre and post training program (n=98)						x ² test P value
	Pretest		Immediate Posttest		After 3 months follow up		
	n	%	n	%	n	%	
A-Multiple choice questions (MCQs) level							
Low level (0-3)	7	7.1	0	0	0	0	40.95 5 0.000 1*
Moderate level (4-5)	19	19.4	3	3.1	2	2.0	
High level (6-7)	72	73.5	95	96.9	96	98.0	
B-True/False knowledge questions level							
Low level (0-4)	29	29.6	0	0	0	0	68.74 7 0.000 1*
Moderate level (5-6)	8	8.2	4	4.1	4	4.1	
High level (7-8)	61	62.2	94	95.9	94	95.9	
Total Handoff Knowledge level							
Low level (0-8)	29	29.6	0	0	0	0	65.8 48 0.00 01*
Moderate level (9-11)	6	6.1	5	5.1	4	4.1	
High level (12-15)	63	94.3	93	94.9	94	95.9	

N.B. Knowledge level was classified into; Low level (<60% of total scores), Moderate level (60-75% of total scores) and high level (>75% of total scores).

Table (2) shows nurses' total handoff knowledge across training programme phases. Total nurses' handoff knowledge improved statistically across training programme phases. Nurses had strong knowledge in the pretest phase (94.3%), immediate post-test, and 3-month follow-up periods (94.9%, 95.9%).

Table (3): Levels of handoff performance of the studied nurses at Children Hospital, Taif - Saudi Arabia pre and post training program (n=98).

Level of Handoff Performance (Each item was scored 0-1)	Performance level of the studied nurses pre and post training program (n=98)						x ² test P value
	Pretest		Immediate posttest		After 3 months follow up		
	n	%	n	%	n	%	
<u>A-Nurse to nurse written communication during handover performance level</u>							29.148 0.0001 *
Low level (0-9)	45	45.9	12	12.2	26	28.0	
Moderate level (10-14)	9	9.2	24	24.5	17	18.3	
High level (15-20)	44	44.9	62	63.3	50	53.8	
<u>B- Nurse-to-nurse oral communication during handoff performance level</u>							76.388 0.0001 *
Low level (0-8)	45	45.9	4	4.1	6	6.1	
Moderate level (9-13)	0	0	9	9.2	10	10.2	
High level (14-18)	53	54.1	85	86.7	82	83.7	
Total Handoff Performance level (38 items)							67.497 0.0001 *
Low level (0-18)	45	45.9	6	6.1	12	12.2	
Moderate level (19-27)	0	0	14	14.3	22	22.4	
High level (28-38)	53	54.1	78	79.6	64	65.3	

N.B. Handoff Performance level was classified into; Low level (<50% of total scores), Moderate level (50-70% of total scores) and high level (>70% of total scores).

***Statistically significant ($P < 0.05$)**

Table (3) shows levels of handoff performance of the studied nurses at Children Hospital, Taif - Saudi Arabia pre and post training program. This table showed that there was a statistically significant improvement in nurses' levels of handoff performance of the studied nurses pre and post training program. At the pretest phase, it was (54.1%), and improved significantly in the immediate post-test phase to (79.6%), and after 3-month follow-up test phase was (65.3%)

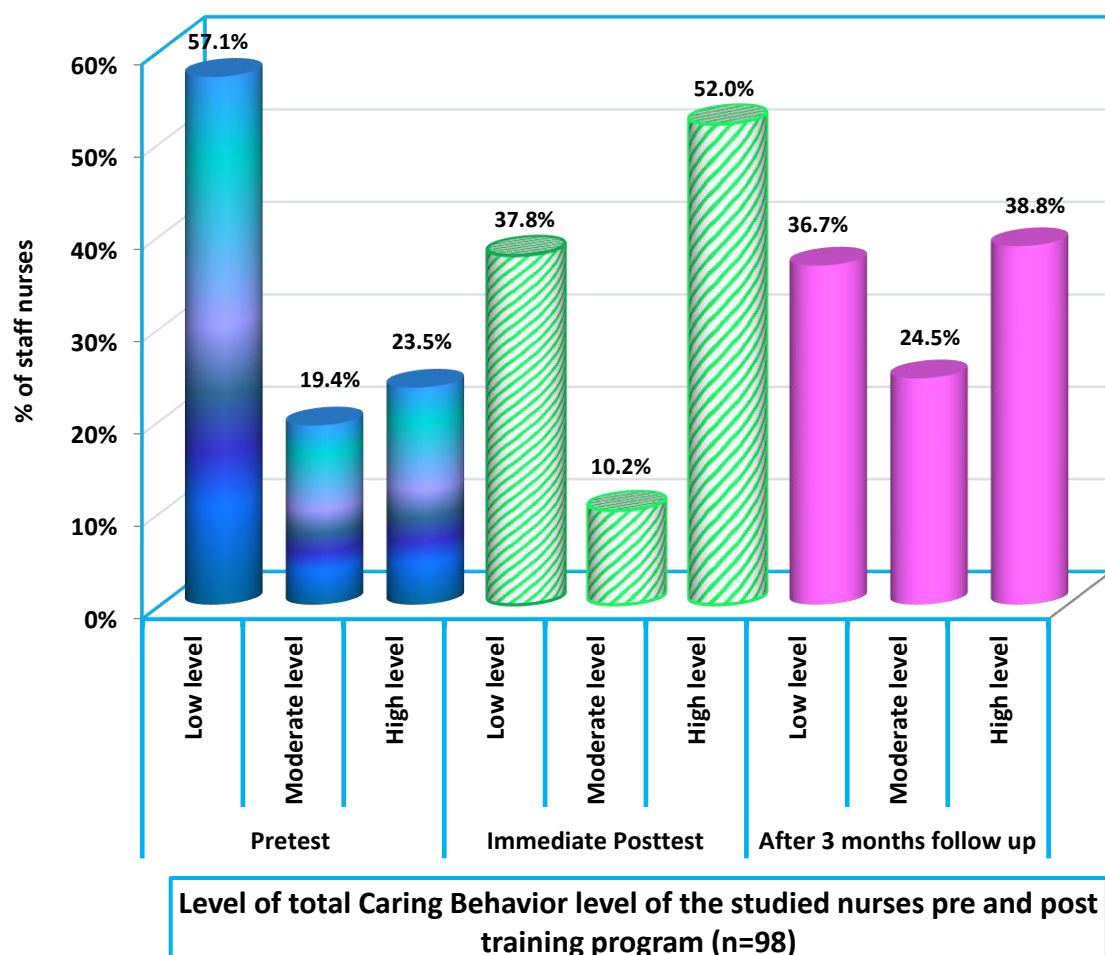


Figure (1): Levels of total caring behavior of the studied nurses at Children Hospital, Taif - Saudi Arabia pre and post training program(n=98)

Figure (1) depicts the pre- and post-training overall caring behavior of Children Hospital, Taif, Saudi Arabia nurses. This table revealed that nurses' caring

behavior improved statistically pre- and post-training. The pretest level was low (57.1%), but it improved dramatically in the immediate post-test and 3-month follow-up tests to high (52.0%) and 38.8%, respectively.

Table (4): Correlation between total scores of handoff Knowledge, handoff Performance and Caring Behavior among the studied nurses at Children Hospital, Taif - Saudi Arabia pre and post training program (n=98).

Variables	Total Handoff Knowledge scores of the studied nurses pre and post program (n=98)					
	Pretest		Immediate posttest		After 3 months follow up	
	r	P value	r	P value	r	P value
Total Handoff Performance scores	0.043	0.676	0.683	0.0001*	0.640	0.0001*
Total Caring Behavior scores	0.697	0.0001*	0.635	0.0001*	0.470	0.0001*

***Statistically significant (P<0.05)**

r=Correlation Coefficient

Table (4) shows the link between handoff Knowledge, Performance, and Caring Behavior scores for nurses at Children Hospital, Taif, Saudi Arabia before and after training. The table shows a highly statistically significant positive association between handoff knowledge and performance scores immediately post-test and after 3 months ($p=0.0001$). A highly statistically significant positive association existed between total handoff ratings. All-phase caring behavior knowledge and scores ($p=0.0001$).

Discussion

The transfer of patient knowledge, responsibility and accountability from one nurse to another; the transmission of clear and exact patient information. A robust handoff process is the This reduces errors, avoids missed treatment and helps nurses to respond rapidly to patient needs, increasing awareness, empathy and responsiveness. Robust handoff knowledge and performance enables nurses to anticipate patient needs, prioritize care and maintain therapeutic communication which is fundamental to caring behavior (Maluenda et al. Confident nurses can communicate with their colleagues, relieve anxiety during the change of shift, and focus on patient-centered operations without being

interrupted or inspected. Therefore, handoff is more than a technical task; it affects the way nurses work with patients and facilitates compassionate, attentive, and holistic care. Effect of handoff knowledge and performance training on caring behaviors of nurses. Such increased skill facilitates a safer, more structured workflow allowing nurses to focus on personalized care, patient rapport, and emotional and psychosocial needs (Lee, & Wilson, 2023). The objective of this study was to evaluate the impact of handoff training on caring behaviour of nurses at Children Hospital, Taif, Saudi Arabia.

Nurses' handoff knowledge pre- and post-training

The current results suggest that nurses have complete knowledge of handoff during training phases. Statistically, nurses' handoff expertise was improved throughout the programme. Nurses' handoff knowledge was high at the pretest, increased in the immediate posttest and improved further during the follow-up phase, indicating the knowledge gained during the training session persisted. Structured instructional activities reinforce fundamentals of theoretical and practical handoff communication. The baseline knowledge of nurses was good in pre-test phase, but the training programme standardized content, clarified responsibilities and obligations and enhanced awareness of safe handoff principles, enhancing understanding. The increases immediately after the test and at follow-up suggest that repeated exposure, practice, and reinforcement helped consolidate learning and improve retention of knowledge over time, proving the sustainability of the training programme. Galatzan & Carrington (2022) who studied data, information and knowledge communication during nursing handoffs, found that structured approaches and informatics-supported handoff processes improve nurses' understanding and clarity of transferred information, improving handoff knowledge and consistency. In addition, Seada & Bayoumy (2017) reported a statistically significant improvement in nurses' handoff knowledge following programme implementation which was sustained after training, validating the observed improvement across programme phases in the present study. In keeping with the current results, Ghonem & El-Husany (2023) discovered that the SBAR training programme of the shift report increased the knowledge, practice and perception of the shift handoff communication and the retention of it over time among nurses. Also, Smith, Peterson, & Beck (2015) explored handoff training among medical students on attitudes, knowledge, and skill sustainability. They found significant knowledge improvements immediately after training with sustained outcomes over follow-up periods indicating the

sustainability of educational interventions. El-Guindy, El-Shahate, & Mohamed (2022) also observed significant increases in nurses' awareness of shift change handoff following the intervention, with the favourable effects remaining over time. The continuous improvement demonstrated in this study was confirmed by the results of Mashail et al. (2024) that a nursing handoff educational package improved the handoff knowledge and communication ability of nurse interns.

Nurses' rating of performance of handoff before and after training This study revealed a significant improvement in nurses' overall handoff performance following training. Nearly half of the nurses scored well on the pretest. The majority of nurses scored well on the initial posttest after the programme and maintained those results at the 3-month follow-up.

Structured and targeted instructional interventions enhanced nurses' practical competence, communication correctness and adherence to standardized handoff protocols. This rapid improvement on the posttest is attributed to the information and skills that were applied in a clinical setting. The approach allowed nurses to adopt more effective techniques through targeted coaching and opportunity for practice, resulting in a long term shift to high level performance. The intervention probably improved oral and written communication in handoffs because of enhanced cognitive understanding and behavioral confidence. The good performance maintenance at the 3-month follow-up might be explained by programme reinforcement and practice.

In line with the present findings, Lee, & Wilson (2023) performed an integrative literature review of nursing handoff education and found that educational and training interventions consistently improved nurses' handoff performance, especially in the immediate post-programme period, with some indication of partial decline over time but with sustained improvement relative to baseline levels. In addition, a scoping review by Maluenda et al. This is consistent with the current findings El-Guindy et al. (2022) found that an educational course on shift change handoff resulted in a statistically improved nurses' handoff performance, which was sustained above baseline at follow-up. In line with the present study's results, Vanderzwan et al. (2023) conducted nurse-to-nurse handoff with distractions and interruptions and found that customized training programs improved nurses' handoff performance despite environmental barriers. (2025) showed significant improvement in nurses' performance and communication effectiveness after participating in structured and simulation-based handoff communication training programs, with the highest improvement immediately after training supporting the present study's findings.

Ghonem & El-Husany (2023) implemented a training course on SBAR shift report that improved nurses' knowledge, practice, and perception of handoff communication with slight decline at follow-up, but performance remained above baseline. Ji and Chung (2024) designed SBAR simulation training to improve patient handoff communication among nursing students and found that simulation-based education improved handoff performance immediately after training supporting the present study's strong immediate post-test results. (2023) reported that shift handoff training improved nurse interns' knowledge and communication competence and practical handoff performance. Vanderzwan et al. Multi-site simulation research on handoff education programs demonstrated immediate, sustained improvement in handoff performance with ongoing reinforcement (Riesenberg et al., 2024). An educational course based on a standardized handoff communication model improved nurses' handoff performance and patient safety culture post-intervention, highlighting the need for structured training programs (Ghasemi et al., 2025). Repeated structured practice improved the nurse handoff ability but performance improvements may decay over time without continued reinforcement, consistent with follow up results in this present study (2025). Lee & Lim. (2021) found that students who participated in a simulation-based handoff education course scored significantly higher in handoff performance than the control group and their baseline. The structured simulation training enhanced the practical handoff performance in terms of accuracy and organization among the participants. A patient handoff education courses for nursing students in clinical practice based on the contextual learning theory enhanced handoff performance (Kim & Kim, 2022). The findings suggest that the learners performed better in patient handoffs after the training and the importance of structured instruction. Mashail, et al. (2024) found that a nursing handoff education package resulted in increased handoff knowledge and communication skills in nurse interns. The study indicated that structured teaching techniques increased communication and handoff procedures.

Caring conduct of nurses in children hospital, Taif, Saudi Arabia before and after training. The caring attitude of the nurses in the study showed statistical improvement pre and after training. The nurses' caring conduct was low in the pre-test phase, but increased significantly in the immediate post-test phase and remained high in the follow-up phase, showing that the training course had a persistent good effect. The training may have increased the nurses' therapeutic communication, empathy, compassion, patient-centered care and nursing values. Through interactive lessons, practical demonstrations,

role play and reflective discussion the nurses were able to develop and practice caring habits. The high level of caring conduct seen during follow-up suggests that the training programme has allowed nurses to internalize caring attitudes and to include caring behaviors in caring for patients. The curriculum might have improved the nurses' attitudes, self-awareness and professional identity, and established a caring environment.

Yetti & Nuraini (2019) revealed that nurses who effectively performed bedside handover between shifts had significantly higher levels of caring behavior. They observed that organized communication and active patient participation during handover improved the nurses' care and nurse-patient relationships. The professional development activities and communication-focused treatments enhanced the caring conduct of nurses, which is consistent with the current findings that indicated significant improvements after the training programme. Consistent with the current findings, Bachtiar, Baua, & Pizarro (2023) reported that a caring-based training programme increased nurses' caring behaviours as perceived by patients numerically and maintained positive perceptions over time. Alikari et al. (2022) also reported that education, training and professional development of nurses had positive impact on caring behaviours. This is in tandem with the improvement in caring behavior after the training curriculum in this study. The present findings demonstrated that structured programmes improve caring practices, consistent with the observation of Inocian et al. (2025) that caring behaviors of clinical nurses improved with improved professional support and focused interventions during the COVID-19 pandemic, and validated by the observation of Li et al. (2020) that educational exposure and training experiences enhanced caring behaviors in student nurses. Aty et al. (2020) reported that education, training and organizational support were effective for improving nurse caring behavior. In a similar way to the present study, Labrague et al. (2020) reported that, higher levels of nurse caring behavior were associated with improved quality of care and lower adverse patient events, thereby confirming the value of treatments that increase caring behaviors.

It has been reported that supportive work environments and treatments to increase resilience improve the caring behaviors of mental health nurses (Foster et al., 2020). The data from this study demonstrate that the training plan improved caring conduct of nurses over time. Comparison of handoff Knowledge and Performance scores at Children Hospital, Taif, Saudi Arabia before and after training. The study results reveal a strong statistically significant beneficial association between knowledge of handoff and performance in the

immediate posttest and three months after. This has to be done with regard to the interconnection of nursing competencies and the whole training plan. As nurses apply this knowledge to clinical practice, a strong theoretical basis and evidence-based knowledge of effective communication, patient safety principles, and information transfer processes lead to increased handoff performance.

El-Guindy et al. (2022) reported an educational programme on shift change handoff that enhanced nurses' handoff knowledge and performance following programme implementation, with persistent improvements during follow-up periods. This supports the significant favorable association between knowledge of handoff and performance in the immediate posttest and follow-up phases of the present study. Galatzan & Carrington (2022) in their study on data, information and knowledge exchange in nursing handoffs also emphasized the need for knowledge transmission for accurate performance and professional nursing practices. Their findings reveal the favorable relationships between knowledge, performance and caring conduct in all phases of the training programme. That is, handoff knowledge enhances the nurses' handoff tasks and patient-centered communication. In line with the present findings, Jeoung et al. (2016) reported that an educational curriculum for effective nursing intershift handoff communication increased nurses' intershift performance, self-efficacy and professional relationship. These results are consistent with the present study's findings that handoff knowledge-performance correlations were strong after training.

In addition, Stojan et al. (2015) reported that teaching on handoffs throughout medical school improved postgraduate trainee performance and confidence. This justifies the association between post-training performance improvement and knowledge gain in the present investigation.

Smith, Peterson, & Beck (2015) reported that medical students with higher handoff knowledge levels demonstrated improvement in performance skills over time. Their results showed that there was a significant positive correlation between handoff knowledge and performance at both immediate and follow-up time points of investigation.

Zhao et al. (2017) showed that information transmission is critical to task completion and continuity during asynchronous handoff processes and that strong handoff knowledge is conducive to efficient execution and professional behaviors (especially caring behaviors) in clinical settings, which indirectly supports the present findings.

Pre and post training handoff knowledge and care conduct scores at Children Hospital, Taif, Saudi Arabia.

The current findings demonstrated a very statistically significant positive association between handoff Knowledge and caring behaviors across all training periods. There is a substantial association between handoff knowledge and caring behaviors. This shows that nurses who have understanding of structured handoff protocols are more likely to demonstrate caring behaviors such as attention to detail, patient advocacy, comprehensive communication and patient safety. This suggests that these two features of nursing have intrinsic nature prior to official intervention. Higher baseline understanding of the handoff procedure may have allowed nurses to exhibit more caring behaviors, given both competences were founded on key professional nursing principles such as patient safety, accountability, attention to detail, effective communication, and quality care. This association indicates that nurses with an increased understanding of handoff principles will naturally value the transfer of comprehensive patient information as a caring behavior that protects patients and ensures continuity of care. The present findings are consistent with the study conducted by El-Guindy et al. (2022) who evaluated the effectiveness of an educational programme on nurses' shift change handoff knowledge and performance and its impact on patient care and found that nurses with higher handoff knowledge had better nursing performance and continuity of care. They suggested that knowledge has a positive influence on nurses' professional behaviors. Also, Ghonem and El-Husany (2023) found that an increase in shift handoff communication knowledge was significantly associated with improved nursing practice and professional interaction, indirectly supporting the link between knowledge and caring behaviors identified in the pre-training phase of the present results.

Ali et al. (2023) studied the effect of a shift handoff training programme on nurse intern knowledge and communication competence and found that the enhancement of knowledge led to increased communication competence-an important aspect of caring behavior. Bachtiar, Baua, & Pizarro (2023) studied the effect of a caring-based training programme on caring behaviors perceived by patients of nurses. The nurses' professional knowledge and understanding have a significant effect on their ability to demonstrate caring behaviors, which supports the positive relationship between handoff knowledge and caring behavior in this study.

Alikari et al. (2022) showed that patients and colleagues considered nurses to be more caring, possessed higher professional knowledge and clinical skill. This indicates a direct relation between handoff knowledge

and nursing caring behaviors. Asadi et al (2020) studied the relation between anxiety and nursing care behaviors and concluded that the factors affecting nurses' cognitive and professional function had a significant impact on caring behaviors, suggesting that adequate knowledge and preparedness resulted in increased positive caring behaviors, which is in agreement with the significant positive correlation observed in the pre-training phase of the current study. Table 3. Correlation between total handoff performance scores and caring behaviors at Children Hospital, Taif, Saudi Arabia pre- and post-training.

The results show a strong positive statistically significant relationship between handoff performance and caring behaviors in all three stages of training. The strong association between handoff performance and caring behaviors suggests that nurses who are familiar with and practice structured handoff processes and have the ability to communicate verbally and in writing are more likely to demonstrate caring behaviors such as attention to detail, advocacy for patients, complete communication and patient safety.

El-Guindy, et al. (2022) also found an educational programme improved nurses' shift change handoff knowledge and performance that improved professional nursing behaviors such as patient-centered care and continuity of care. This supports the strong positive relationship seen for handoff performance and caring behaviors across the study.

Conclusion

The findings of the study resulted in the conclusion that the implementation of the training program had a positive and significant impact on nurses' handoff knowledge, handoff performance and caring behavior. The nurses showed significant improvement in handoff knowledge in all phases of the program, which was translated into better handoff performance, although there was a slight decline at follow-up, the performance levels remained above baseline. Additionally, nurses' caring behavior improved significantly from low baseline levels to high levels after the training program, with these gains maintained over time. Moreover, there was a highly statistically significance positive correlation between total level of handoff Knowledge and handoff performance post training program, a statistically significance positive correlation between total level of handoff knowledge and caring behavior pre and post training program, and a statistically significance positive correlation between total level of Handoff Performance and Caring Behavior pre and post training program

Recommendations

In light of the study's findings, the subsequent recommendations are proposed: Suggestions for hospital management: • Designating resources for continuous handoff training initiatives and professional advancement. • Formulating hospital-wide standards for uniform handoff procedures to guarantee consistency. • Promoting the utilization of evidence-based instruments to enhance handoff procedures and caregiving practices.

Suggestions for chief nursing officers:

- Implementing a systematic meeting and feedback protocol to promote transparent communication and enable nurses to convey their ideas.
 - Offering ongoing support and motivation for nurses to engage in oral and writing communication during daily clinical scenarios.
 - Overseeing adherence to standardized handoff protocols across all shifts.
 - Delivering feedback and mentorship to personnel to improve handoff efficacy and compassionate conduct.
- Suggestions for Nursing Professionals
- Engaging proactively in organized handoff training initiatives to enhance understanding and efficacy.
 - Implementing patient-centered methodologies in all transitions to improve compassionate practices.
 - Engaging with colleagues to exchange best practices and insights acquired during the handoff process.

Suggestions for subsequent investigations Investigating the effects of handoff training programmes on patient outcomes and safety.

- Evaluating the efficacy of various handoff training models (simulation-based, workshop-based, e-learning). Examining the impact of organizational culture on handoff procedures and caregiving behaviors.

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