

Educational Process, Issue, Trend

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Don’t interrupt me! development of a handoff education bundle to simulate the real world

https://doi.org/10.1515/ijnes-2023-0092
Received September 10, 2023; accepted February 5, 2024; published online March 27, 2024

Abstract

Objectives: Ineffective nurse-to-nurse handoff communication is associated with information omissions, diagnostic errors, treatment errors, and delays. New nurses report a lack of confidence and ability in handoff communication, which may stem from inadequate training in prelicensure nursing programs. Our objective was to introduce prelicensure nursing students to a standardized, theory-based method for handoff, including behavioral strategies employed by nurses during interrupted handoff.

Methods: A handoff education bundle (HEB) was developed. Kern’s six-step curriculum model was utilized to design, implement, and evaluate the handoff curriculum.

Results: Student feedback highlighted the importance of integrating multiple, varying distractors during learning cycles and recognition of the impact of distractors on handoff.

Conclusions: Implementing a HEB at the prelicensure nursing level could promote competency in handoff communication for new graduate nurses.

Implications for International Audience: Handoff is an international patient safety priority, as inadequate communication has been linked to adverse patient events.

Keywords: nurse handoff; nurse education; distractions; interruptions; competency-based education; Kern’s curriculum model

Introduction

Nurse-to-nurse handoff refers to the transfer of patient information and responsibility from one to another and occurs on average 4,000 times a day in a typical teaching hospital [1, 2]. Ineffective communication during handoff is associated with information omissions, diagnostic errors, treatment errors, and increased costs. Rates of errors in handoff communication range from 30 to 80%, increasing the risk for poor patient outcomes [1, 3]. The unpredictable practice environments in which nurses work shapes communication flow, with distractions and interruptions identified as common barriers to effective handoff. Distractions, most commonly from people, patients, and environmental noise lead to interruptions which impact nurses’ ability to communicate, concentrate, and provide a complete transfer of information necessary for incoming nurses to provide safe, competent care [4].

According to the American Association of Colleges of Nursing (AACN), communication is a core component of nursing education and practice and is one of eight core concepts for basic and continuing preparation of nurses.

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However, effective communication, including nurse-to-nurse handoff, has been recognized as a skill in which new graduate registered nurses lack confidence and are inadequately equipped to perform upon entry into clinical practice [6, 7]. It is estimated that only 37% of nursing students receive formal handoff training prior to graduation, and little information exists about handoff education in students’ academic preparation [8]. In a recent integrative review of eight studies on nursing handoff education, it was recommended that handoff training include multimodal approaches with opportunity to observe and practice handoff throughout the curriculum [9]. The need to design handoff training programs using a theory-based approach was also endorsed [9]. Role play and simulations were the most common methods of handoff training among the included studies [10].

The purpose of this paper is to describe the creation and implementation of a handoff education bundle (HEB) using Kern’s six-step theoretical model. Kern’s model can be used to structure quality education with a focus on healthcare disciplines through: (a) problem identification and general needs assessment; (b) target needs assessment; (c) goals and objectives; (d) educational strategies; (e) implementation; and, (f) evaluation and feedback [11]. This project was deemed exempt by the primary author’s Institutional Review Board.

**Approach**

**Problem identification and general needs assessment**

The first step in Kern’s model is problem identification and general needs assessment. To better understand the problem of handoff education in nursing education, a comprehensive review of the literature on handoff education at both the prelicensure and practicing nurse level was completed. In 2016, the Joint Commission reported patient safety concerns due to inadequate handoff and communication shortcomings based on data that estimated up to 80% of serious medical errors had some component of miscommunication error during patient handoff [1, 12]. Both nursing and medical students reported a lack of handoff training, with more than 60% of nursing students and 70% of medical students not having dedicated or standardized handoff education [12]. In 2017, the Joint Commission released a sentinel alert urgently recommending a greater focus on handoff, as it was cited as a common and longstanding problem with little change or consensus since their 2016 report [1].

A 2018 state-of-the-science handoff paper described a lack of effective nurse-to-nurse handoff communication methods and strategies and specifically called out handoff ability as contingent on clinical experience [13]. In a 2023 integrative review of nurse-to-nurse handoffs, the impact of distractors and interruptions during handoff was explored [4]. Practicing nurses reported that interruptions and distractions were limitations in handoff quality and handoff efficiency during inter-shift and unit-to-unit handoff. The two most common types of interruptions and distractions were people (patient, family) and environmental factors (equipment alarms). An organized and standardized approach to handoff was recommended, but few specific examples were identified to effectively mitigate patient safety problems during nurse-to-nurse handoff. None of the literature in the review included prelicensure nursing [4].

Avallone and Weidman [14] noted that there is an abundance of handoff research from populations of practicing nurses, with limited literature describing the effects of handoff education on nursing student handoff skills. The authors noted that students are considered “passive recipients” of handoff and are not given the opportunity to engage in deliberate practice of handoff. Regular practice of skills is recommended; yet opportunities are often limited for nursing students to perform nursing skills beyond their initial learning [15].

**Needs assessment of targeted learner**

Based on the problem of a lack of handoff training among nursing students, a targeted needs assessment evaluating a specific group of learners as well as the learning environment was conducted at a large, urban Midwestern school of nursing. The site was selected based on its diverse student demographics with 37% of
Bachelor of Science in Nursing (BSN) students identifying as White, 24% as Asian, 9% as Black, 22% as Hispanic, 4% as multiracial, and 2% as international [16]. All courses within the BSN curriculum were reviewed to identify relevant handoff education. Limited opportunities were identified. An introduction to handoff communication was incorporated in the required Foundations of Nursing Practice didactic/lab course; however, the skills were not practiced in the accompanying lab. The curriculum was using Situation-Background-Assessment-Recommendation (SBAR) as their primary tool for giving report. SBAR is a structured communication framework to help individuals and teams share information about a patient condition [17]. Of the 12 plus BSN simulation days, 50% included a component of using SBAR during the simulation scenario when the nursing student needs to call the provider. However, none of the simulations include utilizing SBAR in nurse-to-nurse handoff or focus on nurse-to-nurse handoff with embedded distractors and interruptions.

Aggregate end-of-program student survey data collected via the College's analytic platform were also examined. The majority of students cited that communication training is not relevant to them, indicating a lack of insight for this foundational knowledge. The data raised sufficient cause to further investigate the implementation of a HEB to improve curricula.

Goals and objectives

The goal of this project was to develop, implement, and evaluate a HEB for prelicensure BSN nursing students. The objectives of the HEB were to prepare students to: (a) demonstrate effective use of the SBAR tool; (b) identify examples of distractions and interruptions in nursing care and their effect on handoff; and, (c) apply behavioral strategies to handle interruptions during handoff. The HEB goal and objectives support the revised AACN Essentials [5] and were threaded into course objectives [11]. The AACN Essentials [5] provide a framework for nursing programs to prepare BSN nursing students using a competency-based approach. The mapping of the HEB objectives is demonstrated in Figure 1.

The goal and objectives established for this HEB are consistent with those in previous nursing curricula and meet cognitive, affective, and psychomotor domains. For example [14], implemented a theory-based Systems Engineering Initiative Model of Work System and Patient Safety (SEIPS) Nursing Handoff Education Bundle (NHEB) with similar objectives, including evaluation of nursing students’ perceptions of the effectiveness of the NHEB post intervention. Additional examples of prelicensure handoff education goals and objectives include increasing learner communication skills, improving the quality of patient handover, and adoption of a mnemonic to standardize handoff [18].

<table>
<thead>
<tr>
<th>AACN Essentials</th>
<th>Curriculum Objective</th>
<th>Handoff Education Bundle (HEB) Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain 1: Knowledge for Nursing Practice</td>
<td>Demonstrate appropriate communication and collaboration required to deliver high-quality and safe patient care</td>
<td>Demonstrate effective use of the SBAR tool</td>
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<tr>
<td>Domain 2: Person-Centered Care</td>
<td></td>
<td>Identify examples of distractions and interruptions in nursing care and their effect on handoff</td>
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<tr>
<td>Domain 5: Quality and Safety</td>
<td></td>
<td>Apply strategies to handle interruptions during handoff</td>
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<td>Domain 6: Interprofessional Partnerships</td>
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<td>Domain 8: Informatics and Healthcare Technologies</td>
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</table>

Figure 1: Mapping of HEB objectives.
Educational strategies

The next step in the development of the HEB was to apply an evidence-based approach to inform and improve current handoff curricula. The Joint Commission [1] endorses a standardized handoff process for healthcare organizations, deliberate handoff training, and measurement of the success of these trainings and processes to drive improvement. These same principles can be applied to teaching handoff during the educational preparation of healthcare providers before they enter the workforce as licensed providers.

In a systematic review of handoff education in healthcare, simulation and role-play were found to be the primary teaching methods for teaching handoff communication skills [18]. Experiential practice of handoff was noted to facilitate information management, reduce the potential for errors, and improve confidence. Simulation-based education can be developed around knowledge gaps and support the transfer of skills to clinical practice [9].

A combined approach of simulation and didactic was included in the HEB. This was role modeled in a nursing education pilot study [14] and by the Patient Safety Institute I-PASS methodology [19]. The I-PASS was developed by and for physicians to assess and implement standardized handoff processes. Since 2016, the I-PASS training methodology has been implemented in over 100 hospitals and has been associated with reductions in preventable medical errors [19].

For the simulation component, three similar valid and reliable National League of Nursing/Laerdal simulation scenarios focused on adult respiratory care were adapted for use in the HEB. A standardized SBAR, used to evaluate the student handoffs, was created for each of the three handoffs and assessed for content validity prior to use in the HEB. The content validity index for each scenario was greater than 0.83, indicating sufficient agreement between reviewers [20]. During handoff, embedded distractors were selected based on fidelity (level of realism) and relevant findings in the literature [4]. Embedded distractors utilized in the HEB included a phone call and an interruption from a family member.

For the didactic content, students received a 30 min PowerPoint presentation on the importance of handoff processes, a review of SBAR components, and behavioral strategies to handle distractions and interruptions during handoff. The didactic PowerPoint presentation included viewing an actual SBAR handoff with a family member interruption, so that participants and the facilitator could discuss nurse responses to an interruption. Common responses cited in the literature as employed by nurses when interrupted by a distraction include blocking, mediating, and engaging [21]. Engaging is giving immediate attention to the source, whereas mediating and blocking are intentional strategies that do not give immediate attention to the source and which nurses may choose to use when an interruption is attempted or occurs. The didactic content is listed in Table 1.

Implementation

Implementation was guided by Kolb’s Experiential Learning Theory, which focuses on students’ internal cognitive processes and involves the acquisition of abstract concepts [22]. Kolb’s theory is based on assumptions that participants have four modes of learning: a concrete experience phase followed by reflective observation, abstract conceptualization, and active experimentation. The project included three simulations. Simulation 1 measured preunderstanding of handoff and simulations 2 and 3 measured application of handoff skills. In applying Kolb’s theory to this project, concrete experience was obtained through completion of the simulation 1. Reflection and abstract conceptualization occurred through faculty-guided debriefing and presentation of didactic content. Active experimentation occurred during simulations 2 and 3, completed after the didactic content of the HEB. Figure 2 includes the HEB flow diagram.

For this project, seventeen (n=17) students were recruited to participate in the HEB training. Students were invited because they had participated in prior simulation experiences and thus were familiar with the learning environment. Students were asked to sign up for a 2 h time slot to complete the HEB.
For the first simulation, students received a pre-brief of the scenario and then participated in the simulation working in pairs. Immediately following this first simulation, students individually presented their nurse-to-nurse handoff to a standardized participant (actor trained to portray a nurse) in a private room using the SBAR mnemonic. At exactly 1 min into the handoff a distraction that preceded an interruption occurred. For simulation 1, the distraction was a ringing phone, and the interruption was a person from the lab calling to communicate an abnormal lab value. Following the handoff, the students came together to debrief the simulation and nurse-to-nurse handoff experience. The Debriefing for Meaningful Learning (DML) framework was used for all debriefings and facilitated by faculty who were certified healthcare simulation educators [23]. After the debrief, didactic content of handoff was provided.

This process was repeated for simulations 2 and 3. For simulation 2, the distraction was again, a ringing phone, and the interruption was a person from the lab calling to communicate an abnormal lab value. For simulation 3, the distraction was a simulated participant opening the door to the handoff report room acting as a family member to interrupt the handoff report. All handoffs and student responses to the handoffs were audio recorded.
Project implementation and the HEB required the use of simulation technicians, faculty members, and simulated participants to act as bedside nurses to receive handoff report. Due to the size of the simulation facility and the availability of faculty, only four students in total were scheduled during each 2 h time slot. In terms of space, two high-fidelity simulation rooms, four outpatient clinic rooms with recording capabilities and telephone lines, and one debriefing room for delivery of the HEB didactic content and debriefing sessions were needed.

**Evaluation and feedback**

Implementation of the HEB was evaluated through student handoff performance and written feedback. The accuracy and quality of SBAR handoff improved from simulation 1 to simulation 2, while accuracy and quality of SBAR handoff remained unchanged from simulation 2 to 3. Written feedback provided by the students focused on the impact of the distraction, impact of the training, and the challenge of using SBAR. Distractions during handoff were perceived as challenging to participants because it impacted their confidence in giving report and the organization of the SBAR handoff. One student reported, “the distractions made the situation even worse, which made me very disorganized when giving the handoff back to another nurse.” The distraction caused an interruption of the SBAR process, as one participant noted that, “when the distractor was enabled, I found it hard to remember where I left off … ” The ringing phone in simulations 1 and 2 were perceived to be more challenging than the family member interruption: “I think I was more exposed to family members in the past in clinicals, while answering phone calls is not something that I would typically do as a nursing student.” The training provided supported participant confidence in giving report with SBAR and responding to distractors. “Participating in this project helped me realize how critical handoff is to ensuring quality patient care.” Several participants noted the use of a specific method of addressing the distractor, such as putting their finger on the report sheet to remember where they left off and using visual cues of where they left off. Anticipating distractors during the handoff, as one participant noted, helped them be more “prepared and made sure to make note of where I left off before addressing the distractor.”

The recommendation phase (R) of the SBAR was noted to be the most challenging to handoff, and this was not always perceived as related to the distractor. A participant noted that the recommendation was difficult as “it required me to use my critical thinking skills to determine what actions by the incoming nurse would be best for the patient.” Others supported that distractors specifically impacted their recommendation handoff to the incoming nurse because it challenged them to summarize the report: “I felt I could not think of them fast enough with the distractions and was unprepared when I got to that portion (recommendation).” See Table 2 for student feedback.

Feedback from faculty was related to the nuances of scheduling HEB activities. The allocated 2 h time slot per student was challenging to accommodate, as was the number of required simulated participants, given the competing timing of clinical responsibilities and simulation center activities. The incorporation of the distractor into the simulation required careful consideration to meet the objectives established by the needs assessment.

**Discussion**

Handoff is an essential component to prelicensure nursing education that needs to be practiced. Students participating in the HEB were given the explicit opportunity to practice handoff communication with embedded distractors. Because the HEB was designed using Kolb’s Experiential Learning Theory, practice occurred over multiple cycles with integrated opportunities to reflect and process [22]. Feedback obtained from students highlighted the importance of designing a HEB that integrates multiple varying distractors during learning cycles. Students perceived the phone call to be more distracting than the family member because, as one participant noted, answering phones is not normally something they would do as a nursing student. Student feedback highlighted that students responded and attempted to respond to distractors in unique ways. For example,
students responded to the phone call by putting a finger on the SBAR tool to successfully manage the interruption and focus on where they left off on the SBAR.

Integration of nurse-to-nurse handoff training into prelicensure nursing curricula highlights the prioritization of communication as a core component of nursing education. Implementation of the HEB addressed AACN Essentials [5] in the areas of communication (competency 2.2), communicating care delivery through multiple modalities (competency 2.6b), using communication tools effectively (competency 6.1b), and contributing to a culture of patient safety (competency 5.2). Project evaluation demonstrated that a HEB may be successfully integrated into prelicensure nursing programs; however, consideration of resources is important.

Table 2: Student feedback.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Participant quotes</th>
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<tr>
<td>Impact of distraction</td>
<td>“The distractions made the situation even worse, which made me very disorganized when giving the handoff back to another nurse.”</td>
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<td>“I felt it was more difficult to do SBAR with distractions.”</td>
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<td></td>
<td>“I think just sticking to the phases and not jumping around when I remembered something was difficult.”</td>
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<td></td>
<td>“Distractions most certainly negatively impacted my ability to do appropriate handoff which is certainly something I will encounter in the future.”</td>
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<td></td>
<td>“When the distractor (ringing telephone) was enabled, I found it hard to remember where I left off …”</td>
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<td></td>
<td>“The embedded distractor made me lose my train of thought multiple times …”</td>
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<tr>
<td>Impact of training</td>
<td>“With use of the SBAR tool, I was able to formulate my thoughts before handoff and had a visual clue of where I left off before the distraction.”</td>
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<td></td>
<td>“The simulation helped me put the distractor to the side and either continue giving a fixed, cohesive report … by assessing how crucial it is for me to attend to the distractor right away.”</td>
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<td></td>
<td>“Participating in this HEB helped me realize how critical handoff is to ensuring quality patient care. When there are distractors, the nurse giving handoff can very easily forget to include critical information.”</td>
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<td>“… Once I knew I was going to be interrupted in one way or another, I was more prepared and made sure to make note of where I left off before addressing the distractor.”</td>
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<td></td>
<td>“Initially I did not feel very confident utilizing the SBAR tool but as the simulation advanced my confidence with giving report increased.”</td>
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<td></td>
<td>“I have learned how to give report using the SBAR tool in the midst of distractions, without being intimidated by the noise or distractions.”</td>
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<td></td>
<td>“At first it was more difficult … after some teaching it made it easier by putting my finger where I left off …”</td>
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<td></td>
<td>“Recommendation was the most challenging due to the embedded distractions.”</td>
</tr>
<tr>
<td>Challenging phase of SBAR</td>
<td>“Recommendation was the most challenging for me. I felt I didn’t have enough knowledge and experience to give recommendations other than Q4 vitals, follow provider orders, etc.”</td>
</tr>
<tr>
<td></td>
<td>“Recommendation was the most difficult for me. I felt I could not think of them fast enough with the distractions and was unprepared when I got to that portion.”</td>
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<td></td>
<td>“I believe the recommendation phase of the SBAR was the most challenging because it did not involve reading off written or measurable data such as in the S-B-A phases. Instead, it required me to use my critical thinking skills to determine what actions by the incoming nurse would be best for the patient.”</td>
</tr>
<tr>
<td>Most challenging distractor</td>
<td>“I think the phone call was more distracting, though both have made me rethink where I stopped. I think I was more exposed to family members in the past in clinicals while answering phone calls is not something that I would typically do as a nursing student.”</td>
</tr>
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<td>“I found the phone call to be more challenging to deal with since the person on the other end of the line could not see that I was preoccupied.”</td>
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<td></td>
<td>“I think that the phone call was more challenging because there was important information that I only heard while the family member said the information in front of me and the other nurse so they can remember the information too.”</td>
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<td></td>
<td>“… The phone call was more distracting as I would forget which part of the SBAR I left off at … this would possibly lead me to skip the situation and background and jump into the assessment as that is what the phone call was about.”</td>
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</table>
Implementation of the HEB is suggested to take 2 h per student group and requires three faculty to facilitate. In the project, fidelity was increased by utilizing a simulated participant to receive the handoff, a method that this project team would endorse. During implementation, students completed their handoff communication in variable time durations, ranging from 1 to 6 min. To address this time variability, it is advised that interruptions should occur during the recommendation phase of SBAR to standardize the innovation (rather than at an explicit time marker).

**Implications for an international audience**

Handoffs are an international priority area for improvement in both clinical and research arenas [19, 24, 25]. Findings from around the world, including the United States, United Kingdom, Australia, and India, consistently highlight inadequate provider communication during transitions of care, with this deficit as a common cause of adverse patient events [26–29]. As a result, both the [1, 30] strongly recommend processes for structured clinical communication handoff, which is further supported by the AACN, UK National Health Service, Australian Commission on Safety and Quality in Health Care, and other key international organizations [4]. Despite evidence to suggest that health care organizations worldwide are addressing handoff as a patient safety priority, future work is necessary to evaluate the effect of comprehensive handoff education [4].

**Conclusions**

It is recommended that handoff training be integrated throughout a nursing program. Although this short 2 h training had impact for the students, deliberate practice over the course of an entire nursing curricula is likely to have greater impact with sustained benefit. As next steps, this project will be implemented and evaluated as part of a funded multi-site project. Long term, the impact of training on transition to practice is a desired program outcome.

**Acknowledgments:** The authors thank Kevin Grandfield, Publications Manager for the UIC Department of Biobehavioral Nursing Science, for editorial assistance.

**Research ethics:** The research has complied with all relevant national regulations and institutional policies and has been approved by the authors’ Institutional Review Board, University of Illinois Chicago. The application was reviewed on June 22, 2022 and it was determined that this research meets the criteria for exemption as defined in the U.S. Department of Health and Human Services Regulations for the Protection of Human Subjects [45 CFR 46.104(d)].

**Informed consent:** Informed consent was obtained from all individuals included in the study and was approved by the institutional IRB.

**Further statements:** n/a.

**Author contributions:** Each author listed below adheres to the guidelines listed below for authorship: Kathryn J. Vanderzwan, DNP, APRN, ACNP-BC, CHSE; Susan Kilroy, PhD, RN, CHSE; Leah Burt, PhD, APRN, ANP-BC, CHSE; Jennifer O’Rourke, PhD, RN, CHSE (Senior Author).

**Competing interests:** None of the authors declare any relationships that pose an actual or potential conflict of interest (financial, personal or professional), in connection with evaluated manuscript.

**Research funding:** The funding organization, INACSL, played no role in the study design, in the collection, analysis, and interpretation of data; in the writing or report; or in the decision to submit the report for publication.

**Data availability:** Not applicable.
References


