

ORIGINAL RESEARCH

NURSES' COMPLIANCE ON PATIENT HANDOVER PROCESS IN THE PRE-OPERATIVE ROOM OF THE HOSPITAL IN VIETNAM

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Abstract

Background: Ineffective handover is considered a major factor that endangers patient safety in hospitals. Preparing and handing over patients before surgeries directly impact the outcome of the surgery. If errors occur, they could jeopardize the patient's life.

Objectives: To determine the level of nurses' compliance during the pre-operative patient handover process at the anesthesia department. To examine nurses' evaluation on using a pre-operative patient handover checklist.

Methods: This was a descriptive observational study with a cross-sectional approach to examine 196 cases of handing over pre-operative patients performed by 53 nurses from the surgical department, maternity department, obstetrics and gynecology department, emergency department, and anesthesia department. Data were collected from November 2019 to February 2020 using "The Checklist of Assessing Nurse's Compliance on Pre-Operative Patient Handover" and "The Survey Form of Nurse's Evaluation on Using Pre-Operative Patient Handover Checklist." Descriptive statistics, including frequencies and percentages, were used for data analysis.

Results: Nurses' compliance on handing over pre-operative patients with a high level was 71.9%, and with an average level was 28.1%. The handover areas with low compliance rate included: the patients need to be isolated (63.3%), identifying patient information verbally (75%), identifying patient information by hospital bracelet (77%), time to use antibiotics (78.1%), and marked surgical site (79.6%). Over 90% of nurses agreed on the usefulness of the pre-operative handover checklist.

Conclusion: The process of handing over pre-operative patients was performed relatively well, but there were still shortcomings to overcome. Nurses positively evaluated the use of the handover checklist for preparing pre-operative patients.

KEYWORDS

handover; checklist; patient; anesthesia

BACKGROUND

In 2012, The Australian Commission on Safety and Quality in Health Care developed 10 National Safety and Quality Health Service Standards to reduce the risk of patient harm and improve the quality of health service provision. In these standards, the sixth standard mentioned the importance and effectiveness of clinical handover ([Australian Commission on Safety and Quality in Health Care, 2012](#)). Clinical handover is a critical process in health care services in which nurses are typically engaged several times in each working day ([Gu et al., 2012](#)). In this study, the nurses' compliance on pre-operative patient handover is considered to be the implementation of handing over all medical issues related to the surgical patient based on a checklist or a prescribed procedure. This process is performed between nurses in the pre-operative room. This compliance ensures that critical information necessary for patient care is not omitted, and it provides a consistent order in which information should be communicated ([Robinson, 2016](#)). In addition, the nurses' evaluation on using the

handover checklist demonstrates their personal opinion about the effectiveness and usefulness of the checklist when they use it to hand over the pre-operative patient. Using a structured handover checklist will increase the reliability of handover ([Bakon et al., 2017](#)) and promote patient safety ([Halm, 2013](#)).

Poor clinical handovers have been identified as major contributing factors in serious adverse events and a significant cause of preventable harm to patients ([Australian Commission on Safety and Quality in Health Care, 2012](#)). A recent large scale project from the European Commission demonstrated that information handover was responsible for 25% to 40% of clinical accidents ([Suzanne & Diana, 2015](#)). In addition, wrong-site surgery is estimated to occur 40 times per week in hospitals and clinics in the United States; other surgical incidents also include wrong procedure and wrong person surgery ([Tyson, 2012](#)). Therefore, the preparation and handover of patients before surgeries directly impact the outcomes of those surgeries.

In Vietnam, along with the changes and improvements in the health care model of hospitals and medical facilities today, patient handover is becoming more and more evaluated. The Ministry of Health's Circular No. 07 of the "Guidance on Nursing Care for Patients in Hospitals and Health Facilities" stipulates that, when the nurses deliver patients to the operating department, nurses and midwives must handover patients and medical records to an assigned person at the place where the surgery will be performed ([Vietnam's Ministry of Health, 2011](#)). A previous study from [Huyen \(2015\)](#) which assessed the situation of preparation and handover of patients before surgery at Military 354 Hospital in 2015 also showed that the handover process still had many shortcomings: inadequate medical records; nurses received patients without re-checking patient information, accounting for 3.3%; besides, the proportion of nurses who had not signed into the handover book accounted for 48%.

Becamex International Hospital is a new hospital that has been in operation for the past few years. It provides healthcare services with the principle goal of serving the community and focusing on its patient. Becamex International Hospital also performs many intensive surgeries to serve the patients' demands. However, the hospital is yet to have any research investigating issues related to the preparation and handover of pre-operative patients. Although this handover process is performed between anesthesia nurses and nurses from four other departments: Surgical Department, Maternity Department, Obstetrics and Gynecology Department, or Emergency Department, it is always implemented in the pre-operative room of the Anesthesia Department. Therefore, we conducted this research to determine the level of nurses' compliance during the pre-operative patient handover process at the Anesthesia Department. We also examined nurses' evaluation on using a pre-operative patient handover checklist.

METHODS

Study Design

This study utilized a descriptive observational design with a cross-sectional approach to investigate a series of pre-operative patient handover cases.

Participants and Sample Size Calculation

The sample size formula of a cross-sectional study was used to calculate the sample size for this study:
$$n = \frac{Z^2_{(1-\alpha/2)} P(1-P)}{d^2}$$
 ([Charan & Biswas, 2013](#)). Here, n is the sample size; in this study, it is the number of handover cases. Standard normal variate "Z" at 5% type 1 error (P<0.05) is 1.96 and at 1% type 1 error (P<0.01) is 2.58. As in a majority of studies, P values are considered significant below 0.05; hence 1.96 was used in this formula. Based on the previous study of [Huyen \(2015\)](#), the expected proportion in population "P" is 0.48. Finally, d is absolute error or precision, and we choose d = 0.07 to fit the actual situation at Becamex International Hospital. So, the sample size calculated by the formula above is n = 196 handover cases.

In this study, we used a convenience sampling method because it was impossible to identify future surgical cases, and it was also not feasible to make specific lists. The target population in this study was staff nurses from five different departments in Becamex International Hospital - Surgical Department, Maternity Department, Obstetrics and

Gynecology Department, Emergency Department, and Anesthesia Department - who conducted the handover process at Anesthesia Department. The inclusion criteria were official nurses; and handover cases of scheduled surgeries and semi-emergency surgeries. The reason is that these two types of surgeries do not need to be performed immediately, and the nurses are not limited by time to hand over patients. By contrast, emergency surgeries must be performed without delay to ensure the patient's life. Therefore, the exclusion criteria in this study were all handover cases of emergency surgeries. Besides, nurses who were in the probationary period were also not selected for this research. Although this study's primary subjects were nurses, the sample size was 196 handover cases performed by 53 nurses. Therefore, each nurse who transferred the patient was observed with an average of 3 to 5 handover times. For anesthesia nurses who received the patients, each of them collected data from 32 to 33 handover cases. This ensured that the number of patient handover for each nurse was the most equivalent.

Instruments

Pre-operative patient handover procedure and pre-operative patient handover checklist: They were approved and issued by Becamex International Hospital's Board of Directors on October 4th, 2017, currently in use at Becamex International Hospital ([Becamex International Hospital, 2017](#)).

"The checklist of assessing nurse's compliance on handing over pre-operative patients": it was calibrated all categories from Becamex International Hospital's pre-operative patient handover checklist ([Becamex International Hospital, 2017](#)), including 38 items with the answers "Yes" or "No" for compliance or non-compliance. The researcher calculated the results by frequency and percentage for each checklist's content, then calculated and decided the compliance level based on the rate of completing the checklist's 38 items, according to the scale: low (<60%), medium (60%-90%), high (>90%). The demographic information of nurses was also utilized for statistical description.

"The survey form of nurse's evaluation on using pre-operative patient handover checklist": the questionnaire was edited from Technology Acceptance Model Study ([Davis, 1993](#)) with a 5-level Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = No Idea, 4 = Agree, 5 = Strongly Agree. This survey form was reviewed again by five head nurses from the five departments in which data was collected. There was no change in the content of survey questions; they agreed that this survey form was valid, and all questions were easy to understand for nurses. The results of the survey form, including frequency and percentage, were calculated for each answer and each question.

Data Collection

Data were collected at Becamex International Hospital from November 2019 to February 2020 by the principal investigator and two research assistants. These research assistants were nurses who had a 4-year Bachelor's Degree in Nursing and more than five years of hospital work experience. Before the actual data collection, the principal investigator conducted a training session for them on how to determine the level of nurses' compliance during the pre-operative patient handover. Then, they observed and performed a trial evaluation on the same handover case. Finally, the principal investigator compared their two results, corrected and interpreted them until the results obtained

from the research assistants were identical. During the period of data collection, the principal investigator and research assistants observed the handover processes between nurses who transferred patients and nurses who received patients at the pre-operative room; and evaluating their compliance by filling in the box “Yes” or “No” for each category in “The checklist of assessing nurse’s compliance on pre-operative patient handover”. After the number of samples was satisfactory, all nurses participating in the study were given “The survey form of Nurse’s evaluation on using pre-operative patient handover checklist”. All questions and answers in the form were explained by the principal investigator before they answered by circling from their point of view.

Data Analysis

The data were entered into Epidata 3.1 software. R software was used to process and analyze data. Descriptive statistics, including frequencies and percentages, were used to present the study results.

Ethical Consideration

This research was approved by the Medical Ethics Council of the University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam, No. 642/ĐHYD-HĐĐĐ. After we clearly explained the study’s objectives, the participants voluntarily signed the consent form to participate in the study. We ensured that participants were not affected by any benefits in their work.

RESULTS

Level of nurses’ compliance on handing over pre-operative patients

With 196 handover cases in this study, the number of semi-emergency surgeries (54.1%) was more than the number of scheduled surgeries (45.9%) (Table 1).

Table 1 Surgical classification (n=196)

Surgery	Frequency (n)	Percentage (%)
Scheduled	90	45.9%
Semi-emergent	106	54.1%

Table 2 shows that there was a high level of nurses’ compliance on performing pre-operative patient handover checklist at Becamex International Hospital accounted for 71.9%. The remaining was a medium level of 28.1%.

Table 2 Level of nurses’ compliance on pre-operative patient handover checklist (n=196)

Compliance level	Frequency (n)	Percentage (%)
High (completed > 90% checklist)	141	71.9%
Medium (completed 60-90% checklist)	55	28.1%
Low (completed <60% checklist)	0	0%

The percentage of handover contents that nurses complied ranged from 63.3% to 99.5%. Some areas of low compliance rate were: patient needs isolation (63.3%), identifying patient information verbally (75%), identifying patient information by hospital bracelet (77%), time to use antibiotics (78.1%), and marked surgical site (79.6%) (Table 3).

Table 3 Nurses’ compliance rate according to each handover content (n=196)

Handover content	Frequency (n)	Percentage (%)
Handover information		
Patient’s full name	192	98.0%
Date of birth	191	97.4%
Gender	189	96.4%
ID	181	92.3%
Last meal time	186	94.9%
Patient needs to be isolated	124	63.3%
Body temperature	189	96.4%
Respiration rate	190	96.9%
Pulse rate	189	96.4%
Blood pressure	188	95.9%
SpO ₂	165	84.2%
Antibiotics before surgery	159	81.1%
Time to use antibiotics	153	78.1%
Date and time patient arriving at the Anesthesia Department	166	84.7%
Surgeon name	177	90.3%
Handover content		
Identifying patient information verbally	147	75.0%
Identifying patient information by hospital bracelet	151	77.0%
Medical report	183	93.4%
Consent form of performing anesthesia and surgery	194	99.0%
Test results	193	98.5%
Results of electrocardiogram	194	99.0%
Results of X-ray, MRI, CT	194	99.0%
Results of ultrasound	195	99.5%
Blood transfusion commitment	195	99.5%
Indications for using blood and blood products	194	99.0%
Shaved (cut) hair and prepared skin	170	86.7%
Marked surgical site	156	79.6%
Patient wore anti-embolism stockings	194	99.0%
Dentures were removed	195	99.5%
Auxiliary devices were removed	194	99.0%
Jewelry and hairpin were removed	182	92.9%
Nails polished	194	99.0%
Undressed underwear	195	99.5%
Patient was rectally cleaned	195	99.5%
Patient had implant materials/special equipment for surgery	195	99.5%
Patient’s jewelry is stored	194	99.0%
Nurse transferring patient signed	189	96.4%
Nurse receiving patient signed	172	87.8%

Nurses' evaluation on using pre-operative patient handover checklist

Among 53 nurses performing pre-operative patient handovers at Becamex International Hospital, the majority were female, accounting for 94.4%. Nurses who had a 4-year Bachelor degree accounted for 41.5%; 2-year College and 3-year College accounted for 30.2% and 28.3%, respectively. The majority of nurses in the study were nurses with 1 to 10 years of experience, and nurses ranged in age from 30 to

40 years old, accounting for 81.1% and 64.2%, respectively. The Maternity Department had the highest rate of nurses participating in this study, at 28.3%, and the lowest was the Anesthesia Department, at 11.3% (Table 4).

Table 5 shows that most nurses agreed and strongly agreed that the pre-operative patient checklist had been appropriately used. The answer "No idea" still varied from 1.9% to 9.4%.

Table 4 Nursing demographic characteristics (n=53)

Demographic characteristics	Frequency (n)	Percentage (%)
Gender		
Female	50	94.4%
Male	3	5.6%
Education level		
4-year Bachelor	22	41.5%
3-year College	15	28.3%
2-year College	16	30.2%
Work Experience		
Over 10 years	10	18.9%
From 1 year to 10 years	43	81.1%
Under 1 year	0	0%
Department		
Surgical	12	22.7%
Maternity	15	28.3%
Obstetrics and Gynecology	8	15.1%
Emergency	12	22.6%
Anesthesia	6	11.3%
Age		
Under 30 years old	19	35.8%
From 30 to 40 years old	34	64.2%
From 40 to 50 years old	0	0%
Over 50 years old	0	0%

Table 5 Nurses' evaluation on using pre-operative patient handover checklist (n=53)

Content	Strongly Disagree	Disagree	No Idea	Agree	Strongly Agree
Is the pre-operative patient handover checklist effective?	0 (0%)	0 (0%)	1 (1.9%)	23 (43.4%)	29 (54.7%)
In your opinion, is this checklist helpful for preventing medical incidents related to surgery?	0 (0%)	0 (0%)	5 (9.4%)	23 (43.4%)	25 (47.2%)
Do you want to continue using this checklist for patient handover?	0 (0%)	0 (0%)	1 (1.9%)	21 (39.6%)	31 (58.5%)
Given the opportunity, would you recommend this checklist to your colleagues?	0 (0%)	0 (0%)	2 (3.8%)	25 (47.2%)	26 (49.0%)
You have no difficulty when using this checklist to handover patients?	0 (0%)	0 (0%)	5 (9.4%)	25 (47.2%)	23 (43.4%)
In your opinion, should this checklist be widely applied to other hospital departments?	1 (1.9%)	0 (0%)	3 (5.6%)	16 (30.2%)	33 (62.3%)

DISCUSSION

Level of nurses' compliance on pre-operative patient handover

The overall results show that the level of nurses' compliance on handing over pre-operative patients at Becamex International Hospital's Anesthesia Department was implemented consistently, with most nurses scoring high on the survey. However, this is still not a desirable outcome because patient handover is an issue that nurses can complete and master (Sharp et al., 2019).

About handover information

Occasionally, patients' basic information was inaccurate. In some cases, it was completed on the handover checklist, but patients'

information was confusing and different from that of the medical record. Information about the patient's last mealtime is vital for anesthesia during surgery, but it lacked 5.1% of the cases. This result is consistent with the previous research (Huyen, 2015); however, this study's outcome was somewhat improved.

"Patient needs to be isolated" was the area that nurses most ignored during the period of data collection. Thorough handover of this issue helps medical personnel be more proactive in preparing personal protective equipment, preventing infectious disease transmissions from one patient to other medical staff and other patients. In addition, there were still 3.6% of handover checklists that did not have sufficient information about the vital signs of patients, with 15.8% of them

lacking information for SpO₂. The purpose of a pre-surgical patient evaluation is to identify factors that significantly increase the risk of surgical complications on patients. Inadequate checking of patients' vital signs before surgery increases the chances that abnormal situations will not be detected early and threatens patients' safety during anesthesia and surgery processes.

Antibiotic use is a significant problem that directly affects post-surgery infections and wound healing. However, the rate of handing over pre-operative antibiotics and time to use them for patients accounted for only 81.1% and 78.1%. They are relatively consistent with the study at Military Hospital 354 on drug handover (Huyen, 2015). Although these two issues are closely related, the survey's results also show that the percentage of nurses who handed over antibiotics without handing over time to use them accounted for 3%. "The date and time patient arrive at the Anesthesia Department" and "The surgeon name" were still missing on the handover checklists, especially for semi-emergent surgeries' checklists. Possibly, nurses often think that this information has little effect on patients, but this is a mandatory element that must be performed when handing over patients.

About handover content and patient preparation

Compliance rates of nurses who identified patient information verbally and by hospital bracelet accounted for only 75% and 77%, respectively. This content also has the second-lowest level of compliance in this research. Compared to Huyen (2015), this result is significantly lower. Those information deficiencies are very common during patient handover, and information transfer will be further degraded at the next handover (Nagpal et al., 2010).

Medical records often lacked a surgical consultation report of semi-emergent surgeries or some surgeries performed by co-operating doctors. Besides, nurses also forgot to transfer patients' electronic records on hospital software when their patients came to the Anesthesia Department. The surgical consultation reports were usually supplemented and completed by the surgeons after their surgeries were completed, but this is not according to the prescribed surgical procedure. The rest of the medical records, subclinical results, and pre-operative preparation for patients were implemented fully and meticulously by nurses; these resemble Huyen (2015), which also had a high level of compliance rates.

The most common problems associated with medical incidents in surgery are skin preparation and surgical site marking. These ratios were still significantly low at Becamex International Hospital: respectively, 13.3% of patients had not shaved (cut) hair and prepared skin, and up to 20.4% of patients had not had their surgical sites marked. Several cases were considered the surgical site marked, but in fact, those patients had a wound or a bone fracture bandaged and fixed. These cases demonstrated that at that time, many surgeons and nurses had not determined the importance of skin hygiene and defining surgical area before the surgery. Moreover, 7.1% of patients who were transferred to the Anesthesia Department still wore jewelry and hairpins. These increased the risk of burn accidents for those patients when using electro-surgery units during the surgery. To ensure patients' safety, these issues need to be followed strictly before the operation.

Compared to the survey of the pre-operative patient handover process at Military Hospital 354, nurses transferring and receiving patients still forgot to sign the handover note when the handover process was completed (Huyen, 2015). Still, the rate at Becamex International Hospital had improved significantly.

Nurses' evaluation on pre-operative patient handover checklist

Nursing demographic characteristics

Of the 53 nurses participating in the research, there was a large difference in gender between male and female. Female nurses accounted for 94.4%, which was much higher than males, only 5.6%. This is consistent because the proportion of female nurses currently accounts for the majority, not only in Becamex International Hospital but also in Vietnam and the world. At present, the proportion of nurses having a bachelor's degree at Becamex International Hospital is still increasing and dominating; this shows that they are continually improving their knowledge and qualifications to increase the quality of care for patients.

Nurses' evaluation on using pre-operative patient handover checklist

In this research, 98.1% of the nurses agreed on the checklist's effectiveness when it was used to hand over pre-operative patients. This demonstrated nurses' high satisfaction regarding this checklist. A high level of nurses' satisfaction in the handover process will increase their responsibility to communicate and transfer information regarding the patient's condition to their colleagues, and they can continue to manage their patients effectively (Karmila et al., 2019).

There was a broad consensus that structured handover procedures were critical for safe patient care. Checklists and handover tools can create convenience, improve the reliability of the handover process, and reduce stress for nurses when they hand over their patients to their colleagues (Kalkman, 2010). That is the reason why 52/53 nurses in this study agreed to continue using this checklist for patient handover, and 96.2% of nurses also wanted to introduce this checklist to their colleagues. Effective patient handover through the handover checklist also contributes to increasing nurses' satisfaction with this process because the information provided will be more completed and structured, avoiding the loss of important information related to patient care. A study conducted by Baker (2010) also claims that the process of performing handover would contribute to increasing nurses' satisfaction in patient care, providing information about patients' condition effectively, and solidifying teamwork among medical personnel.

At Becamex International Hospital, none of the nurses reported difficulty using the checklist to hand over patients. In fact, there is a perception that nurses' satisfaction on patient handover is partly influenced by providing too much patient information from one nurse to another (Baker, 2010). It is likely that due to this, 1.9% of nurses strongly disagreed about the widespread adoption of this checklist for other departments because this checklist just revolves around handing over the issues related to patients' pre-surgical preparation. In order to apply the checklist to other departments, it is necessary to modify or use another handover frame to suit the needs of the entire hospital. Therefore, it is likely that no tool is optimal for all handover issues. Handover improvement needs to be modified based on different

demands and needs to suit the actual situations from different departments (Herawati et al., 2018; Kalkman, 2010).

The implication of this study

The results of this study are the basis for assessing the nursing practice in patient handover and recognizing incomplete issues. Although there are measures to improve handover worldwide, greater levels of innovation are needed, aimed at addressing the difficulties that still exist in different health care organizations and enhancing the quality of care for patients. This study is also considered one of the new references on the issue of pre-operative patient handover; it will help other researchers refer and compare data in the future.

Future studies should deploy a new handover tool that enhances nursing communication. It is also necessary to explore more creative ways of conducting patient handover. Especially, handover procedures in hospitals and medical facilities also need to be continuously updated to ensure patient safety and suit the innovation of the health system in the world.

CONCLUSION

The process of pre-operative patient handover at Becamex International Hospital was implemented relatively consistently, with 71.9% at a high level of compliance. There was still some content that nurses need improvement, such as: "Marked surgical site", "Time to use antibiotics", "Identifying patient information verbally and by hospital bracelet", "Patient needs to be isolated." The study also received positive reviews from nurses on using the handover checklist for patients before the surgery. Over 90% of nurses agreed that this checklist was effective, helpful, and could prevent medical incidents related to surgery.

Declaration of Conflicting Interest

There is no conflict of interest to be declared.

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Authors Contribution

N. M. N. was the principal researcher; responsible for the study design, drafting, data collection, data analysis, and interpretation. H. T. N. X. was the first science instructor who gave instructions on making and editing the article and responded to reviewers' comments. K. E. was the second science instructor who revised the article.

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Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

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