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Factors Affecting Bedside Handover between Nurses inCritical Care Area

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Abstract: *Handover is an important process in nursing care especially in critical care area because it involves transferring patient data. Improving handover between nurses can lead to improved patient safety. Nurses must be qualified to provide quality care, and they need to have the nursing knowledge and skills to avoid errors and increase the well-being of patients. Nurses must view patients as the centre of care because care is the core of nursing practice. The purpose of this study was to identify factors affecting bedside handover/handoff between nurses in the critical care area from a patient safety perspective. A literature review was used as a method in this study. This method helped to identify the problem and locate articles necessary to achieve the study's aim. The authors achieved the aim by reviewing, analysing, and examining the results from 16 primary academic studies. The articles found via searches in the PubMed database. The results showed that factors affecting bedside handover in critical care area, specifically from four aspects: nurses, patient, environment, hospital standards perspectives. In addition, the authors identified the factors affected by nurses, which related to nursing behaviour, communication skills, nurse experience, and documentation during bedside handover. Nurses need to be skilled in effective communication and work in collaboration with a high level of interaction, with successful decision-making, appropriate staff, and responsible leadership. In addition, if critical care nurses develop and update their delivery of care, that leads to achieving patient safety. The authors consider the communication and nursing experience as main points to focus on during bedside handover. Additionally, handwriting considered the main problem in the documentation, which could be resolved by typing via electronic documentation.*

This literature review showed that nurses need to improve bedside handover in critical care area by minimizing those factors (our finding) that to increased levels of patient safety. Nurses need to always consider the patient during nursing care practice as a centre of care.

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I. Introduction

Handover process helps the health care provider to summarize or describe patient data via communication. Handover can occur between nurses in one unit or nurses working in different units. For nurses in one unit, a handover occurs during a shift change, but for nurses in different units, it may happen whenever patients are transferred[1,2]. Handover can include temporary transfers (such as for operations) and permanent transfers (from the critical care unit to another unit). In general, handover includes responsibility and accountability for one or many patients who are moving from temporary or permanent conditions[3].There are different types of methods for handovers. These can include electronic (typically a computer-based system), tape records, and/or documents on nursing sheets, the latter of which is often associated with a verbal handover (face-to-face)[4]. The electronic handover involves nurse entering patient information into a computer system, where it is saved, then retrieved, and read by staff coming in for the next shift. The tape handover method includes a nurse recording the patient information during work on a recording device and then playing it back during the shift change for the next shift nurse (or the next shift nurse can play the recording back). A documentation handover involves a nurse writing on a nursing sheet or other specialized document by explaining the patient's data thus far and the patient's condition. A verbal handover is an oral exchange between nurses (one coming off shift and one about to begin a shift) to review a patient's condition during the previous shift. Handovers can take 30 to 45 minutes to complete, but the time involved depends on the patient's condition and other factors that may note during a handover. Handovers can occur at the bedside, in a handover room, or at nurses' stations[4,5,2]. However, bedside handover is an older method that takes place around the patient's bed. It characterized by involving the patient as a participant, which may help to improve care. It gives a patient access to the medical condition and nursing care information[6].The advantages of bedside handover manifested on the patient and nurses' satisfaction as well as the patients' family that by feeling more informed about their care and knowledge increased about their illness[7,8]. It may enhance the trust and respect between nurses and

patients. Thus, the nurse can provide appropriate time for the patient and their family, which may lead to, increased patient safety[7]. Also, the bedside handover modified to meet client preferences and values when exercising clinical judgement and facilitates patient-centred care[9]. The particular advantages which manifested in improved efficiency, accountability, and accuracy of bedside handover. In contrast, the patients' disadvantage for bedside handover includes difficulties to understand the medical information, lack of privacy, anxiety increased with incorrect information, hearing about their illness and so much information[8]. However, there is a lack of literature available about the transfer of responsibility and accountability during clinical bedside handover[10,11]. Patient safety is an important factor in nursing practice, which guides the authors to follow the study's aim. Moreover, because care is a core of nursing, a nurse needs to reach the highest level of care quality as possible. The handover is a part of a nursing care that can be affected by many interrupting factors[12]. The study focuses on improving patient safety regarding nurses' interaction during bedside handover among critical care nurses. The aim of this review was to identify factors affecting bedside handover/handoff between nurses in critical care area from a patient safety perspective.

II. Material And Methods

The aim of this study was to identify factors affecting bedside handover/handoff between nurses in critical care area from a patient safety perspective.

Study Design: a literature review method used in this study. The information collected from published scientific primary academic studies[13]. PubMed is an online search engine used to find articles based on the United States National Library of Medicine. It provides information and data regarding medical science and health. The MeSH (Medical Subject Headings) database used for searching different terminology regarding research concepts[13].

Data collection: The authors used inclusion and exclusion criteria during the search process in PubMed.

Inclusion and exclusion criteria: The articles have included nursing perspectives and be written in the English language. All of the articles chosen were primary sources, were about the human species, and had a publication date of not more than 11 years (2003-2013). Any research not written in English was excluded. Furthermore, if the studies had been published more than 11 years ago, were excluded (unless no other study contained the same information).

Search process: The authors were used the MeSH terms to search for articles. During the search process, not all articles were accessible. In those instances, the authors used the PubMed search engine, to find many of the articles **(seeTable 1).**

Table 1: Search process

Date of search	Search terms	Identified Articles (hits)	Abstracts Reviewed	Articles Examined	Articles Included
06-May-2013 At 10:00	"Patient Handoff"[MeSH]	97	30	10	2
16-May-2013 At 14:00	("Intensive Care Units"[MeSH]) AND "Patient Handoff"[MeSH]	11	8	6	2
25-May-2013 At 12:00	("Critical Care"[MeSH]) AND "Patient Handoff"[MeSH]	0	0	0	0
03-June-2013 At 13:30	("Emergency Medical Services"[MeSH]) AND "Patient Handoff"[MeSH]	18	10	5	1
10-June-2013 At 15:00	("Emergency Medical Services"[Mesh]) AND handover	50	25	10	1
21-June-2013 At 16:30	Factors AND "Patient Handoff"[MeSH]	12	6	4	1
30-June-2013 At 14:30	Emergency care AND handover	64	30	9	1
30-August-2013 At 13:00	Emergency department AND handoff	28	10	4	1
04-September-2013 At 16:00	Factors AND Handoff	41	29	15	0
16-September-2013 At 13:00	Intensive Care Units AND handoff	24	13	7	2
22-September-2013 At 13:00	Intensive Care Units AND handover	33	15	9	1

22-September-2013 At 13:30	Intensive Care Units AND bedside handoff	2	2	2	1
22-September-2013 At 14:00	Intensive Care Units AND bedside handover	2	2	2	2
22-September-2013 At 14:30	Critical Care AND handover	64	34	20	1

Data analysis: The authors read findsand read 16 articles several times to analyze them clearly **(see Appendix II)**. Each of the authors read each article individually followed by discussion of each article together. Then, the authors printed out those articles and highlighted the information related to the research area with different colors. Then, the data was collected and summarized, focusing on the study aim, and the quality of each article was checked and classified by using the guidelines based on Sophiahemmet University's rule requiring the use of Berg, Dencker, & Skärsäter (1999), and Willman, Stoltz, & Bahtsevani (2006)[14]**(see Appendix I).**

Classification of included articles: While classifying and grading the quality of articles, the authors used the guideline based on Sophiahemmet University's rule (**see Appendix I**). All of the articles explained their methods and results clearly but not all of them. One article used a Randomized Controlled Trial (RCT) as a method. The authors found that ten articles were Qualitative (Q) studies, and two articles were Retrospective (R) studies. One study was a Clinical Controlled Trial (CCT), but the final two articles were Non-Controlled prospective (P) studies. According to the authors' estimation, 12 of the articles were judged to be of high quality. The remaining four studies were judged to be of moderate quality because they failed to mention some of the methods used regarding the environment of the interview and sometimes the questions were not clear (**see Appendix II**). The authors divided the articles into quantitative and qualitative method categories. However, the authors found nine articles that used qualitative methods and three articles that used the quantitative methods. Four articles used both quantitative and qualitative methods. Details for all of these articles are outlined in the accompanying matrix **(see Appendix II**).

Data quality: The authors of this study focused on ethical consideration as the most important factor during the search process for achieving the study aim. The authors avoided cheating and plagiarism as well. The authors assisted their readers by including a reference list and by using a clear process for the study to increase the trust and belief of the readers. Furthermore, the authors correctly used references and saved the copyrights to support their research and other studies. The reference list is provided as a guide for readers to research their own information. The authors avoided anonymity and were honest during documentation and *analysis of* data for this study. Regarding the results section, the authors did not change any information in order to achieve the study aim and presented clear and factual findings. All sources cited were judged trustful, and all of the articles used have been approved for publication. The authors clearly described the study processes used to collect and analyze data in order to increase the validity, credibility, and reliability of this study[13,15].

III. Result

The authors have found that many strength and weakness factors can improve or decrease the quality level of patient safety from the following aspects:

- ***Nurse***

1.Nurse behaviour:The nurse's behaviour may influence a bedside handover in both strength and weakness factors. On the strength side, cooperation between nurses during a bedside handover can help especially with critical care cases. A nurse's attitude during communication in a bedside handover is important, as the nurse can show positive interest while receiving patient information. Coping with difficult situations and avoiding duplication in bedside handover can reduce misunderstanding between nurses. On the weakness side, some nurses may fail to assist other nurses during a bedside handover, especially with an ill patient who may make the other nurse feel anxious. Some nurses feel dissatisfied with bedside handover for personality reasons that can decrease the level of learning to listen. Junior staff may feel fear from a lack of knowledge about a new situation that may lead them to miss important information. That can lead to overwork or affect patient condition[16,17].

2.Nurse experience:Nurse experience has an effect in transferring important information regarding a patient's condition and on controlling a bedside handover process. As strength, the more experience a nurse has, the more likely he, or she, is to be accurate and responsible. Variation in experience levels between different nurses might lead to weakness consequences as well, such as not understanding, or difficulty in delivering patient information. A lack of nursing experience can also occur if a nurse excludes information not thought to be important at the moment; this information can be forgotten with time and only to be focused on patients' current states[18,19].Greater experience allows nurses to better manage the timing of a bedside handover. Time management allows enough time for a bedside handover to be completed while also promoting patient

safety[16,20,21]. The time is important because a bedside handover takes a longer amount of time on average per patient in critical care areas. That is because increased task uncertainty due to inexperience leads to increased time needed per patient during bedside handover[23,24].

3.Communication skills:Communication skills are a main strength during a bedside handover, because good communication leads to good bedside handover. It can enhance the value of face-to-face interactions. A bedside handover contains both verbal and non-verbal communication. A good communicator is more professional and contributes to successful bedside handovers by stating the facts and being serious during the bedside handover process (not overly humorous). As well as being, able to readily understand the problems and to talk with other nurses either verbally or by interpreting body language. Communication experience with collegiality helps to clarify language, deal with different aspects, and know the barriers that occur during the bedside handover process. Some nurses felt that the working in a structured team by a walk around bedside handover could help to gain the nurses' knowledge about each patient on the unit[24,25,26,21]. Nurses should present the bedside handovers in an organized and systematic manner, starting with patient information, the previous shift's events, and ending by describing the patient documents[16, 21]. Another weakness that can affect bedside handover is that different nurses' priorities on a main topic of communication can lead to unknown conflict. For example, during bedside handover a nurse discussed admission cause and patient history more than writing that on nursing documentation. In another example, a nurse documented the patient's mobility and medication more than was discussed during bedside handover[25, 22]. However, most information mentioned in a bedside handover involves patient history and any changes in a patient's condition[27,28]. There are also barriers that might lead to miscommunication during a bedside handover. Miscommunications, which mostly occur during receiving information or transmitting patient information, may lead to overwork or unfinished work. Miscommunications occur by either not providing enough information or not correcting patient information. In addition, miscommunication mostly happens with unstructured or incomplete bedside handovers. Finally, many nurses develop care plans in relation to their observations about the patient's condition and include this information in their bedside handover[17,23,18,19].

4.Documentation:Documentation is basic in the bedside handover, because a nurse needs to review bedside handover from this documentation and confirm that the nursing care was done. It also helps to assure safety by describing the sheet during bedside handover. The strength factors regarding documentation are clearly describing each event that occurs in a shift based on evidence. It needs to be understandable and clear handwriting, and to follow proper procedures. In addition, awareness with terminology and abbreviations helps to improve documentation, writing each intervention after it is finished, when the nurse is close to the patient's bedside. When a nurse participates in a bedside handover to the next shift, he or she may use a small piece of paper to write important notes about the care done. When documenting patient information, it can be helpful for a nurse to record the important data by using different colors, such as blood pressure in red[25,21,24,29]. Nurses should document using a process similar to the present case that focused on the content of information. The content of the patient information needs to begin with patient details such as name, age, and gender and end with thorough documentation containing a patient's current condition, medical issues, the care plan (treatment), and medication as well[16,27,20]. The weakness factors of documentation can include difficulties in understanding the handwriting if a nurse does not write clearly. In addition, incomplete patient data can occur. Because it differs from nurse to nurse, the description of a patient's condition or care given can be vague. Because of that, the description needs to explain the care given beside evidence-based practice to minimize errors. In some cases, a nurse who receives the handover did not read back a patient file such as a handover sheet or patient investigations, which can affect nursing care. A lack of nurses' knowledge regarding scientific terminology and abbreviations can affect understanding of the handwriting. Moreover, the nursing documentation may not make too much sense of the shift. If a nurse does not write what happened during a shift, that may lead to reduced patient safety, because it will be difficult to follow care for the next shift[25,16,30,2423]. Some of the lack of information in documentation during bedside handover can occur when it summarized too much or not structured well. On the other hand, centralized papers on unit board, which describe the patient's condition, can help nurses in urgent situations, especially with critical cases or sudden emergency cases[26].

- ***Patient***

One of the strengths factors of the bedside handover that it allows the patient an opportunity to learn more information about his or her condition. Some nurses are interested in involving patients in the bedside handover, because it provides the patients with further knowledge and reassures them about their condition. Furthermore, because the patient acts as the center of information during a bedside handover, it can enhance and improve patient-nurse interaction, which, in turn, can allow patient-nurse feedback without any barriers. Bedside handovers are also helpful in clarifying patient questions regarding treatment, and in more accurately

determining the patient's needs. A bedside handover can be helpful in allowing the nurse to explain medical terminology and other unfamiliar words that the patient might not understand. In addition, the patient will feel free to inform the nurses of any new developments that may happen. Moreover, a bedside handover gives patients a chance to correct any inaccurate information regarding their medical history and to remind nurses may they forget something. For these reasons, both patients and nurses perceive that bedside handovers which help to improve patient safety[29,30,17]. The weaknesses factor that can affect the bedside handover on the patient side are a nurse's poor grasp of the language spoken by the patient, or a simple misunderstanding can lead to unknown issues. Some nurses feel better with completing a bedside handover at the door in order to avoid any matter discussed being overheard by other nurses or patients. It should note that is in some cases a bedside handover needs to complete in a more private way, especially when the patient requests that privacy. If a patient has pointed out a sensitive topic, which they prefer not to be discussed, such as patient psychological issues, an ethical dilemma occurs, as confidentiality issues tend to arise. The confidentiality issues mostly occur with the time for a bedside handover overlaps with visiting hours when family or others are present. If the patient doesn't want anyone to know about his or her condition, the nurse must respect that and find another way to handoff the patient information to the next nurse, possibly by asking the visitor(s) to "please, step out of the room." Finally, language issues are also important to consider. Not all patients speak English well, so the nurse needs to resolve language and understanding issues with patients[25,30,24].

- ***Environment***

The environment can decrease the quality of bedside handovers in many ways, especially in critical care areas. A stressful environment may cause the critical care nurses to be less willing to interact and cooperate with bedside handover. A noisy environment can have a negative effect on a bedside handover because the loud sounds in a critical care area might lead to miscommunication. The noisy environment of a critical care unit can contribute by interrupting the nurse with requests or questions, which can lead to a breakdown of the bedside handover sequence and the loss of important information, for example, when patients say, "Excuse me, excuse me." Some nurses do not have conduct with bedside handover without environmental changing to reduce the noise level. To guard against this, nurses should be alert in writing down each important point of care. Bedside handover characterized by help the nurses to be too closely from the patient bed during verbal bedside handover either documentation. Another environmental factor is work overload, which may make a critical care nurse feel stress during the handover process and may lead to loss of important information. Finally, a bedside handover should ideally complete in a quiet environment[24,22,21]. Critical care nurses share their emotions less than other units, because of that, personal behaviour considered an issue between nurses or work overload as an environmental issue. In addition, critical care areas have higher bedside handover duration times for each patient than other areas. Regarding the previous point, the junior nurses might have some issues such as less manage due to time and unbalanced of managed the care given which can affect the bedside handover process[22,16].

- ***Hospital standards***

Hospital standards can have either a strength and weakness effect on critical care nurses during apply a bedside handover. Hospital standards require a nurse to know about patients during bedside handover. It is better for all nurses to have an idea about all patients in the critical care area, so they can cover the needs of other nurses (who may be on break time or in an emergency situation for nurses or patients). Some hospitals apply standards requiring one nurse to every one or two patients. Some nurses do not have enough information regarding other patients, which can enhance or decrease patient safety depending on the condition. Hospital standards also utilize systems and policies to improve verbal and written communication, which makes the bedside handover information easier to read and more understandable. The standards can be helpful if document the description of each nursing documentations, which, associated with verbal communication during bedside handover. The bedside handover includes three sources of patient information: verbal, nursing notes, and written as highlighted important information. In addition, the standards can improve bedside handover between critical care nurses because of clear plans followed by nurses who are sufficiently aware of them. Regarding nursing documentation, the standards can be effective by applying understandable forms to help the critical care nurse to fill over the content of bedside handover more easily[18,24,19].The difficulties during a bedside handover as a new hospital standard can be many, such as variation of nursing understanding, nursing experience, coping, and nursing motivation to apply it. These issues can play important factors affecting bedside handover, especially with first-time application. Finally, the quality of applying standards of bedside handover can lead to successful outcomes regarding increased patient safety[24,31].The incident reports ones of application lead to improve the bedside handover. The incident reports show a high number between nurses in critical care area. In the majority of these incident reports, the nurses give incomplete or poor bedside handovers, which have a negative effect on patient care. There are specific incident reports in which incorrect information regarding a bedside handover was recorded or an entirely wrong action taken. These incidents are important, as patients can harm because of

miscommunication between nursing teams, especially when they do not have a proper process for bedside handover and do not have clear standards. There are also occasions where standards may exist, but a nurse fails to apply those standards[19].

IV. Discussion

The nurse can apply the framework of **patient-centeredcare***prerequisite, care environment, patient-centered processes, and expected outcomes* with bedside handover practice. Regarding *prerequisite* that focuses on the nurse's own characteristics in delivering patient care, that have relation to nursing attitude during apply bedside handover. In addition, for the *care environment* that, involves the environment in which care delivered, has relation to nursing interaction with environment when applying bedside handover. The patient-centered *processes* is to deal with the patient as a center of care during bedside handover. The last point appears which *expected outcomes* and it is connected to achieve the patient safety as well as patient center of care[32,33].

Critical care nurses must be specially qualified by having knowledge and skills in professional practice and training in this area. Because the critical care environment contains many things that can cause anxiety, critical care nurses need to be aware of how to make a healthy work environment. According to Ulrich et al. (2006), to achieve a healthy work environment, nurses need to be skilled in effective communication and work in collaboration with a high level of interaction, with successful decision-making, appropriate staff, and responsible leadership. In addition, if critical care nurses develop and update their delivery of care, that leads to achieve patient safety[34].

A stressful environment decreases cooperation between nurses, which reduces nurses' interaction as well. When interaction between nurses is reduced, the work overload will be increased due to critical situations. Because of that, environmental factors can lead to errors, which affect patient safety as well as bedside handover[32,42]. Specific nursing interventions that lead to errors are the nurses not writing the nursing note (documentation), which may cause the nurse on coming shift to miss some patient information. Furthermore, noisy environments related to machines, patients or other causes could affect the communication process causing the nurse not to hear or to misunderstand the main content of the bedside handover[22,21].

The authors consider the communication and nursing experience as main points to focus on during bedside handover. These factors are contributing to other factors affecting bedside handover. Effective communication has positive effects on bedside handover. This effective communication focused on the content of a message, a way of transferring the message and receiving the feedback. Verbal communication is mostly associated with writing documentation that helps to explain the whole documentation. Furthermore, verbal communication should be clear, understandable, and in a normal range of voice that depends on a condition and nursing experience. Nonverbal communication, such as body language, is most effective during communication and is more believable by the patient. In addition, body language can show our feelings without talking, such as facial expressions, body movements, appearance, and eye contact[35,24,29]. Because bedside handover contains both verbal and nonverbal communication, critical care nurses need to be used to effective communication to provide safety as well. In addition, the communicator needs to be more professional by saying the facts and being serious during the bedside handover process[24].

Miscommunication in bedside handover occurs with a defect or a break in the communication process between critical care nurses. Moreover, miscommunication occurs in the content of patient information when the sender does not understand the content, or it is difficult for the receiver to understand[17,35,23]. When the language becomes poor or not understandable, that leads to miscommunication. In addition, not all patients speak English well, and the nurse needs to resolve this problem by involving someone as translator to improve communication process or by taking an excuse from the patient to start the bedside handover. Moreover, the patient needs to understand everything said by nurses during the bedside handover. The nurses must inform the patient about the terminology or abbreviations used to minimize patient misunderstandings as parts of patient center care process, which might lead patients to feel stress or anxiety and ask many questions. Because of that, the critical care nurse can avoid such terminology altogether or explain it to patients[30,21,33].

On the other hand, the idea behind documentation on bedside handover is to show the nurse's work during the previous shift and protect the nurse from any possible problem with the patient. The bedside handover documentation needs to contain the important patient information. Most missing patient information is due to nurses summarizing that information by writing it without any details or describing an event such as Cardiac Pulmonary Resuscitation (CPR). Some nurses do not describe the CPR in documentation; they just present the event verbally without documenting it.The documentation should be in clear and understandable handwriting, not containing strange words or unknown abbreviations. Each word written in patient documentation must be legal to use and easy for other nurses to follow. Handwriting considered the main problem in documentation, which could be resolved by typing via electronic documentation[18,26,27].

Differences in nursing experience can affect bedside handover in critical care area. A nurse passes through several stages until he or she has adequate experience, starting as novice and ending up as an expert.

These stages help nurses to develop and improve their knowledge gradually until reaching the highest level of nursing care. In addition, it helps nurses to think more critically regarding their experience and look to situations from different perspectives. A nurse might not be aware of the handover process in their area because of inexperience. Furthermore, they might be aware but feel it difficult to apply for many reasons, such as feeling a shamed that the place is new, or they do not have enough communication skills to deal with other nurses. This could affect patient information by missing the data or not reviewing patients' documentation, which leads to thoughtlessness and can harm patients. Furthermore, the senior nurses have time management skills, are more confident in their work, and can communicate effectively with other nurses. Some experienced nurses made exclude in some information they thought is not important, such as patient history or any important information regarding the old file (previous file). However, most experienced nurses have the following a systematic manner of bedside handover[16,20,28].

Moreover, each hospital has a standard related to the bedside handover different or similar to others. The standards are mostly helpful and aid nurses' in achieving patient safety. The documentation needs more to be legal because standards promoted by an organization, which means they must be legal too. The documentation in bedside handover depends on what the nurses write down and explain. In addition, professional and updated standards may help during communication, either verbal or written during bedside handover. The nurses can improve their competency to be more effective in critical care areas. This will allow critical care area nurses to be more responsible, self-confident, and independent. The standards can influence by variation in nursing experience, unclear standards, and stressful or work overloaded and work environment. Regarding that, the incident report is more in the critical care area than other area in hospital setting[19,31].

V. Conclusion

The authors considered the findings like a circle connected to each other, unable to move to one stage until the completion of the previous stage, because if there is anything wrong from the beginning of the bedside handover process, it could harm patient safety. During the bedside handover, the nursing management between their interaction and environment with hospital standards, which will directly affect nursing interaction, includes communication skills, nursing attitude, experience, and documentation. That circular process is quite important to achieve patient safety, as well as the nurse avoiding all weaknesses affecting bedside handover. Finally, errors can happen, but the most important is to keep improving with evidence-based practice to reach patient safety.

VI. Clinical Implementation

The authors' suggestion that is the finding of this study can apply and assist nurses in a critical care area during bedside handover to develop their nursing care as well as achieve patient safety regarding bedside handover. In addition, this study might help to focused on weakness factors that must avoid for hospital want to apply bedside handover as a new standard on critical care area.

VII. Recommendation

During the thesis process, the authors faced some challenges in making recommendations for further study. To begin with, further study can gain more information on minimizing the weaknesses affecting bedside handover by interviewing nurses who work in critical care areas. Another recommendation is found a higher effective standard for a bedside handover in critical care area that to improve patient safety. The main ideas being both recommendations are to focus on the patient as a center of care and develop patient safety.

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APPENDIX I

CLASSIFICATION	GRADING OF ACADEMIC QUALITY		
	I = High quality	**II = moderate**	**III = Low quality**
Randomized controlled trial (RCT) is a prospective study that entails a comparison between a control group and one or more experiment groups.	Large, well planned and well executed multicenter study with an adequate description of protocol, material and methods including treatment techniques. The number of patients/participants is large enough to answer the research question. Adequate statistical methods.	*	Randomized study with few patients/participants and/or too many partial studies with insufficient statistical strength. Insufficient number of patients/participants, inadequately described method or large attrition rate (participant dropout rate).
Clinical controlled trial (CCT) is a prospective study that entails a comparison between a control group and one or more experiment groups. Not randomized.	Large, well planned, and well executed study with an adequate description of protocol, material, and methods including treatment techniques. The number of patients/participants is large enough to answer the research question. Adequate statistical methods	*	Limited number of patients/participants, method inadequately described faults or lacking in protocol and insufficient statistical strength.
Non- controlled study (P) is a prospective study but without a control group.	Well defined research questions, sufficient number of patients/participants and adequate statistical methods.	*	Limited number of patients/participants, method inadequately described faults or lacking in protocol and insufficient statistical strength.
Retrospective study (R) is an analysis of a historical material that is related to something that already happened, for example patient charts.	Number or patients/participants sufficient to answer the research question. Well planned and well executed study with an adequate description of protocol, material, and methods.	*	Limited number of patients/participants, method inadequately described faults or lacking in protocol and insufficient statistical strength.
Qualitative study (Q) often is an investigation where the aim is to study phenomena or interpret meaning, perceptions, and experiences from the perspectives of the participants. The aim can also be to develop concepts, theories, and models.	Context clearly described. Selection of participants motivated. Clearly described selection criteria, data collection, transcription process, and method of analysis. Credibility and reliability described. Relation between data and interpretation evident. Critique of method.	*	Poorly formulated research questions. Patient/participant group inadequately described. Method and analysis not sufficiently described. Presentation of results incomplete.

Classification guide of academic articles and studies regarding quality in both quantitative and qualitative research, modified from Berg, Dencker & Skärsäter (1999) and Willman, Stoltz & Bahtsevani (2006).
* Some of the criteria for level I are not met, but the academic quality is deemed higher than level III – Low quality

APPENDIX II

Author(s) Year Country	**Title**	**Aim\ Objective**	**Methods**	**Participants (Attrition rate)**	**Result**	**Quality Design**
Farhan, Brown, Vincent, Woloshynowych 2012 United Kingdom	The ABC of handover: impact on shift handover in the emergency department	To test the impact of a new tool for shift handover, 'The ABC of Handover', in the emergency department (ED).	Quantitative method. Observational study.	N=83 (0)	The authors observe and evaluate the percentage of items mentioned during bedside handover before and after 'ABC tools'. The ABC tools are helpful to organize the bedside handover to the next shift. In addition, it effectively improves clinical care and patient safety focused on critical care area.	I RCT
Hains, Creswick, Milliss, Parr & Westbrook 2012 Australia	An ICU clinical information system – Clinicians' expectations and perceptions of its impact	To understand how ICU clinicians perceived a new system would impact on work practices in Australian ICUs, as much of the current	Qualitative method. Interview study.	n=66 (0)	The language and handwriting of patient information should be readable and understandable to the other nurse. In addition, the communication improves between nurses because of clear plan and awareness of bedside handover process. Furthermore,	Π Q

		evidence is generated from overseas.			patient safety can improve with increase an accurate practice, which leads to decrease errors as a nurse has experience.	
Jefferies, Johnson & Nicholls 2012 Australia	Comparing written and oral approaches to clinical reporting in nursing	The aim of this study is to investigate how patient problems, interventions and outcomes of care are described in both oral and written communication in nursing and whether information critical to the patient is omitted.	Qualitative method. Examined the content of nursing documentation and transcripts of clinical handover.	n= 262 (47)	The authors found the instances of critical care area between the nursing documentation and bedside handover that regards care required, outcomes of care, and other indications. In addition, the authors find the differences between some examples of the nursing documentation focuses on the writing way that depends on nursing characters.	I R
Jeffs et al. 2013 Canada	The Value of Bedside Shift Reporting Enhancing Nurse Surveillance, Accountability, and Patient Safety	To explore nurses' experiences and perceptions associated with implementation of bedside nurse-to-nurse shift handoff reporting.	Qualitative method. Interviews study.	n= 43 (0)	The authors found an important of involve patient during bedside handover to clarifying the information needs for patient. In addition, some of nurses consider that involves patients in bedside handover can help to improve care. However, for other nurses may not helpful to involve patients especially with critical care condition. Moreover, handwriting on bedside handover help nurses to do a quick assessment. Bedside handover helps the nurses too closely from patient during bedside handover either documentation.	I Q
Johnson & Cowin 2013 Australia	Nurses discuss bedside handover and using written handover sheets	Explore nurses' perspectives on the introduction of bedside handover and the use of written handover sheets.	Qualitative method. Semi structured interview.	n= 30 (0)	The authors' have identified major themes included; (1) Bedside handover strengths and weaknesses; (2) Patient involvement in bedside handover; (3) Good communication is about good communicators, (4) Three sources of patient information (bedside handover, handover sheets and nursing notes) depend on hospital standards.	I Q
Keenan, Yakel, Lopez, Tschannen & Ford 2013 United States	Challenges to nurses' efforts of retrieving, documenting, and communicating patient care information	To examine information flow, a vital component of a patient's care and outcomes, in a sample of multiple hospital nursing units to uncover potential sources of error and opportunities for systematic improvement	Qualitative method. Observational study	N= 20 (0)	The authors found out the differences for balance of paper versus electronic charting that helps practicing of bedside handover and used of centralization paper describe patients' conditions. In addition, the authors discussed the important of communication skills during bedside handover process	I Q
Kerr, McKay, Klim, Maree Kelly & McCann 2013 Australia	Attitudes of emergency department patients about handover at the bedside	To explore patients' perspectives of bedside handover by nurses in the emergency department (ED).	Qualitative method. Semi-structured interviews study.	N= 30 (0)	The bedside handover gives clearly understand related to their question. A nurse needs to be under privacy, confidentiality and respect a patient need. In addition, if a patient perceive involves in bedside handover may help to develop nursing care. However, patients have point out a sensitive thing cannot discuss front of them, such as nurse personal life and	I Q

					patients health issues.	
Klim, Kelly, Kerr, Wood, & McCann 2013 Australia	Developing a framework for nursing handover in the emergency department: an individualized and systematic approach	To explore emergency department (ED) nurses' perceptions of current practices and essential components of effective change of shift nursing handover.	Quantitative and qualitative method. Interview and survey study.	N=104 (0)	The bedside handover gives opportunity to patient have more information about their condition. Some nurse interesting to involve patients on bedside handover may because to give patient enough knowledge. The other nurses feel better to do handover on the door to avoid any discussed matter from nurse or patients. The most topics discussed during bedside handover were patient condition.	I Q
Mayor, Bangerter & Aribot 2011 Switzerland	Task uncertainty and communication during nursing shift handovers	Explore variations in handover duration and communication in nursing units.	Quantitative and Qualitative method. Structured interview study.	N=80 (0)	The authors found the bedside handover duration in ICU more than another department. In addition, the authors found the variation of the main topics discussed in bedside handover include medical state of the patient, reason of admission, work organize, treatment, and care. The authors discuss the function of communication during bedside handover such as emotional and level of nursing experience.	I P
McFetridge, Gillespie, Goode & Melby 2007 Northern Ireland	An exploration of the handover process of critically ill patients between nursing staff from the emergency department and the intensive care unit	The aim of this study was to explore the process of patient handover between ED and intensive care unit (ICU) nurses when transferring a patient from ED to the ICU.	Qualitative method. Examine the nursing documentation, individual interview and focus group interview study.	N= 12 (0)	The result part discussed the factors influencing bedside handover were in organization the whole process or part of bedside handover process such as the nursing attitude and communication skills. In addition, the authors found the main missing in information content during document the bedside handover. Nursing experience and nursing attitude play an important role during apply bedside handover.	Π Q
McMurray, Chaboyer, Wallis & Fetherston 2010 Australia	Implementing bedside handover: strategies for change management	To identify factors influencing change in two hospitals that moved from taped and verbal nursing handover to bedside handover.	Qualitative method. Semi structured observation and interviews study.	N=566 (0)	The authors found out the possibility of applying strategies of bedside handover in critical care area by followed five factors. First, "being part of the big picture" which discussed the level of nursing understanding for bedside handover. Second, explained the differences between bedside handover and previous handover. Third step "the provision reassurance on safety and quality" by supported the written sheet during bedside handover. Fourth step, discussed coping with apply bedside handover by respect other and come on time to avoid any duplication or misunderstanding. Last step focused on "learning to listen" that discussed the nurse motivation to accept bedside handover strategy.	I Q
Nagpal et al. 2010	Postoperative Handover Problems, Pitfalls, and	To identify the information transfer and communication problems in postoperative	Quantitative and qualitative method Interviews	n= 68 (0)	The authors found out the most common failure occurs in basic of patient information during bedside handover such as incomplete bedside handover,	II Q

United Kingdom	Prevention of Error	handover and to develop and validate a novel protocol for standardizing this communication.	study.		no formal structured and poor in handwriting either bedside handover. In addition, the authors found some documentation was not complete related to multitask of nurses during bedside handover.	
Pezzolesi et al., 2010 United Kingdom	Clinical handover incident reporting in one UK general hospital	To determine the prevalence and characteristics of clinical handover incidents that occurred across a medium-size UK hospital	Quantitative method. Examined the incidents reports.	n= 334 (0)	Regarding to critical care area that most of incident report found because of miscommunication in during bedside handover. In addition, a nurse does not have policy (stander) to follow or may have but a nurse not applies it. Moreover, the experience plays an important role as well as the variation in experience can affect on nursing bedside handover. The authors have mentioned a high incident report related shift-to-shift bedside handover in one unit.	I R
Philpin 2006 United Kingdom	Handing Over transmission of information between nurses in an intensive therapy unit	This article considers two keys - The end of shift information transmission. -Verbal bedside handovers and written accounts.	Qualitative method. Ethnographic observation and interview study.	N=15 (0)	Bedside handover process ones of an important part during care. It needs to be organizing under expert nurses to prevent errors. Furthermore, the way of communication either verbal or not verb can lead to affect the bedside handover process from language issue or from body language. Then, a noisy level in intensive care unit needs to be minimizing to decrease level of miscommunication. The documentation or nursing notes needs to be wrote clearly and understandable.	Π Q
Richmond, Merrick, Green, Dinh, & Iedema. 2011 Australia	Bedside review of patient care in an emergency department The Cow Round	to evaluate the effectiveness of the Cow Round (see design) as a tool for improving patient safety to establish a relationship between the total number of issues missed and the number of patients reviewed on the round.	Quantitative method. Examined survey study.	N=247 (43)	The authors find out the variation for the most common issue occur during bedside handover in emergency department. First, clinically unstable patients. Second, change in observations. Third, Medication, not given or additional prescriptions. Forth, change in primary diagnosis or management plan. Fifth, changes in planned disposition, that is, admit to an inpatient unit, discharge, or further review.	I CCT
Spooner, Chaboyer, Corley, Hammond & Fraser 2013 Australia	Understanding current intensive care unit nursing handover practices	To assess the content a completeness of the intensive care unit nursing shift-to-shift handover	Quantitative and qualitative method. Observational study.	N= 20 (0)	The content of information regarding bedside handover was under the key principles of bedside handover. The content information deliver can affect on another nurse work on next shift. In addition, nurse experience can play an important role during bedside handover.	I P

Randomized controlled study (RCT), clinically controllers study (CCT), Single non-randomized study (P), Retrospective study (R), Qualitative study (Q)

I = High quality II = Moderate quality III= Low quality