



**Head Nurses' Management Regarding Patient Safety and Its Related Factors in
Public Hospitals Aceh Province, Indonesia**

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Thesis Title Head Nurses' Management Regarding Patient Safety and Its
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ABSTRACT

This descriptive correlational study was designed to describe and examine the relationship between head nurses' management regarding patient safety and its related factors in public hospitals in Aceh province, Indonesia. The study was conducted at 14 public hospitals in Aceh province, from January to March 2013. A proportionate stratified random sampling technique was used to recruit 123 head nurses from 14 out of 21 hospitals in three geographical areas of Aceh province. The data collection instruments were: the Demographic Data Questionnaire (DDQ) and the Head Nurses' Management regarding Patient Safety Questionnaire (HNMPQ) developed by the researchers based on six areas of the JCI's patient safety goals, statements and use of the PDCA cycle in managing patient safety. Internal consistency reliability was tested, yielding a satisfactory coefficient of .92 for the entire scale, and .87 to .95 for the dimension scales. Data were analyzed by using frequency, percentage, mean, and standard deviation. An independent *t-test* was used to compare the mean differences of head nurses' management regarding patient safety and related factors including age, level of education and years of experience as a head nurse. Furthermore, a one way analysis of variance (ANOVA) test was used to compare the

mean differences between head nurses' management regarding patient safety with types of nursing delivery.

The overall score of head nurses' management regarding patient safety was at a high level ($M=333.85$, $SD=49.61$). Head nurses' management of each dimension including identifying the patient correctly, improving effective communication, maintaining safety of high alert medications, ensuring correct procedures, reducing the risk of healthcare associated infections and reducing the risk from fall were at a high level.

There was no significant mean difference of head nurses aged between ≤ 37.51 years and > 37.51 years regarding patient safety management ($t = 1.51$, $p = .13$). For education, the findings showed that there was no significant mean difference between head nurses who held a diploma or a bachelor degree ($t = 1.36$, $p = .17$). The findings of working experience showed that there was no significant mean difference between head nurses whose working experience was less than five years or more than five years ($t = 0.37$, $p = .70$). The findings of type of nursing delivery showed that there was no significant mean difference between functional method, team method or mixed team and functional method ($F = 1.65$, $p = .19$). These findings indicated that high level of head nurses' management regarding patient safety may lead to reduce adverse, error, and mortality. Therefore, head nurses' management using PDCA model was a strategy to ensure patient safety during hospitalization.

Keyword: patient safety, head nurses management, factors, Indonesia

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

In the last few decades, healthcare systems have improved drastically resulting in better patient outcomes. However, there is also a growing recognition that patients do not always receive a consistent and high quality of healthcare. Many countries have experienced adverse events that have highlighted failures in their healthcare systems and various international studies have highlighted the burden of accidents caused by adverse events within the health and social care settings, which significantly impacted patients, families and healthcare systems (Regenstein, 2004).

At present, patient safety is an international and a large issue in healthcare. It reflects professional practice and also the reliability of an organization. Many scholars mentioned that the effort to prevent harm and adverse events during hospitalization would lead to patient safety. However, adverse events always occur in the healthcare system. According to the World Alliance for Patient Safety (WAPS, 2005), the healthcare system is highly complex and some serious adverse events could impact upon the patient. The Institute of Medicine reported that “To err is human,” also stated that 44,000 to 98,000 patients in the US died from medical errors every year (Kohn, Corrigan, & Donaldson, 2000).

Patient safety is a process within the healthcare system intended to increase positive patient outcomes. Patient safety refers to the provision of treatment in healthcare that result in the improvement of patients’ conditions without causing

harm to them. The term “patient safety” shows how nurses understand safety as well as what is necessary to be done to ensure safety for patients and the efforts to improve it. Patient safety can be defined as the protection of a patient from experiencing causing harm, injury, or an adverse event that can lead to risk (Australian Institute of Health and Welfare [AIHW], 2011).

Adverse events are not always caused by human errors but many of them are. Regarding adverse events due to human error, the cause can be attributed to individual practitioners and/or the managerial/organizational system of care. A retrospective record from an earlier review, conducted at hospitals in the London area, reported that 10 to 11% of hospitalized patients experienced one or more adverse events, of which more than half of them were preventable. When grouping according to stages of care (i.e., diagnosis, preoperative assessment and care, and management etc.), the researchers found that adverse events of some stages were totally preventable. For example, adverse events at the stage of ward management can be infective pressure ulcers and/or chest infections. These could be due to the failure of identifying patients at risk and undertaking prophylactic measures (Neale, Woloshynowych, & Vincent, 2001). Thus, if nurse administrators/managers are concerned they can offer a system of nursing delivery practice that can enhance patient safety.

In order to minimize potential adverse events from any cause, there is a need to devise a strategy to prevent these events from occurring. Nurses are an important part of the healthcare system and can improve patient safety. Clarke and Aiken (2003) mentioned that nurses who are competent in patient safety seek to detect patient’s early signs daily and in doing so prevent complications or any adverse patient outcomes. According the Institute of Medicine (IOM, 2004), nurses have

abilities to manage the administration of medication, assess a patient's conditions, supervise a patient's activity, oversee personnel, and manage other essential tasks which facilitate patient safety. As Lucero, Lake, and Aiken (2009) pointed out, if nurses fail to carry out the necessary nursing care, including ongoing surveillance, then this inaction could lead to adverse patient events.

In reference to the reasons above, patient safety care is managed by nurses in wards. The head nurse performs as a manager in the ward and has a duty toward improving patient safety. Leadership and management are the organizational components to enhance patient safety (IOM, 2004). Leape, Epstein, and Hamel (2002) stated that patient safety is not only the task of individual nurses but it is also the responsibility of the head nurse as a leader in their ward. In some cases, nurses occasionally make mistakes because systems, tasks and processes are poorly designed.

Hospital administrators, specifically head nurses, should conform to the standard practices concerning patient safety. It is also worth assessing whether head nurses have perceived the patient safety goal statements appropriately. The Joint Commission International (JCI, 2011) has established six areas of patient safety goals that can be used to assess head nurses' management. These include (a) identifying patients correctly, (b) improving effective communication, (c) maintaining the safety of high alert medications, (d) ensuring correct procedure, (e) reducing the risk of healthcare associated infections, and (f) reducing the risks of patient harm resulting from falls. Furthermore, head nurses must be competent enough to design, communicate, and apply these patient safety goals while supervising their staff (IOM, 2004). In doing so, they may employ some tools to guide effective implementation of these goals. The most common method applied in healthcare to manage quality and

safety is the PDCA (Plan-Do-Check-Act) cycle or the Deming model (as cited in Dahl, 2001).

Several factors influence the level of management, for example, age, educational levels (Gould, Berridge & Kelly, 2007) and working experience (Gantz, Soreson & Howard, 2003). A model of nursing care in the unit is another factor that influences management (Houser, 2003). There are various methods that nurses can apply in order to improve their management for patient safety including self-study, attending seminars and reading educational matter related to management patient safety.

Many studies have been conducted to explore head nurses' management regarding patient safety in different settings. In a study of Voratommatip (2008) with 126 head nurses, selected from emergency departments of community hospitals in southern Thailand, it was found that the level of patient safety management was high. In another study of 130 nurses working in general hospitals in southern Thailand, it was found that head nurses' have perceived safety management in their workplace (Yincharoen, 2009). A study conducted by Madsalee (2010) indicated that safety management was significantly and positively related to safety behaviors of pre-operative nurses. The above studies focused on patient safety management in specific wards such as operating rooms, intensive care units or emergency rooms. Various concepts have been used to explore and study the issue of patient safety management; it is really important that head nurses should have the ability to be a role model regarding patient safety.

In Indonesia, patient safety is a new issue applied in hospitals as a standard for quality of delivery care. There is one study regarding patient safety focusing on the prevalence of adverse events. Lumenta (as cited in WHO,

2006) presented that in 11 hospitals in Jakarta, Indonesia, the prevalence of hospital acquired infection and falls were 9.2% and 6 to 16%, respectively. Taking this into account, it is challenging for head nurses to manage their unit safely. To date, there is no known study regarding this matter. Therefore, it is necessary to explore head nurses' management regarding patient safety in the context of the Indonesian healthcare system, and in Aceh in particular.

Objectives

The objectives of this study were to:

1. Identify the level of head nurses' management regarding patientsafety.
2. Examine the related factors regarding patient safety.
3. Examine the relationship between head nurses' management and its related factors regarding patient safety.

Research Questions

1. What is the level of head nurses' management regarding patient safety?
2. What are the related factors regarding patient safety?
3. Are there any relationships between age, level of education, working experience, type of nursing delivery and head nurses' management regarding patient safety?

Conceptual Framework

The conceptual framework of this study was constructed by integrating the conceptualization of patient safety goals and quality management and some related factors including ages, level of education, working experience and type of nursing delivery. The Indonesian Ministry of Public Health has adopted the Patient Safety Goals policy from the Joint Commission International (2011) and has recently implemented this policy to all healthcare settings throughout the country since 2011. The patient safety goals statements are elaborated in the policy statement of the Health Minister in Chapter IV, Verses 1 and 2. In order to determine whether hospital administrators, specifically head nurses, conform to this policy and its statements, this study will assess whether head nurses have perceived the patient safety goal statements appropriately. These statements include: (a) identifying patients correctly, (b) improving effective communication, (c) maintaining the safety of high alert medications, (d) ensuring correct procedure, (e) reducing the risk of healthcare associated infections, and (f) reducing the risk of patient harm resulting from falls.

Head nurses' management. Head nurses' management refers to the head nurses' actions related to design, communicate and apply patient safety goals to all nurses, staff and other healthcare provider. In order to apply patient safety goals in the unit, head nurses need a tool/method to guide effective implementation of these goals. The most common method applying in healthcare for patient safety management is PDCA (plan-do-check-act) model. The PDCA model consists of (1) plan, identifying, establishing informed goals, setting guidelines, setting the indicators and analyzing the problems, establishing objectives and how they will be achieved, (2) do, implementing the plan, emphasizing responsibility, explaining clearly

instruction and encouraging staff (3) check, analyzing results, monitoring staff, implementing audit programs and modifying the plan to realize implementation, (4) act, introducing systemic changes, evaluating the program, supervising staff, revising the program or guidelines and training the staff. Each will be further elaborated upon in relation to the head nurses' management of patient safety.

Plan. In the PDCA cycle, planning is the first step. Planning requires processes to identify hazards, risks and shortcomings in a patient safety management system and establish and implement plans for improvement. Measurable objectives are established to achieve the greatest probability of risk reduction.

Do. Do phase involves several activities, such as generating possible solutions, selecting the best of these solutions, and perhaps using techniques like impact analysis to scrutinize them.

Check. In check phase, head nurses verify whether processes achieved desired results and effectiveness of the "do" step. Verifying could mean any form of monitoring or measurement of the activity. In systems of quality, it might include: monitoring using visual inspections or listening to staff by employing focus group discussions. In monitoring or measuring equipment required appropriate maintenances.

Act. If there are discrepancies found between what was planned and what was done, head nurses need to analyze the cause and act to improve the situation. In the management context, a discrepancy between the plan and the reality is typically referred to as a nonconformance. There are 3 main types of improvement action. The first type of improvement action is to fix nonconformity, which is the action taken to rectify immediate problems. The second improvement is a corrective

action, which is taken to eliminate the causes of the nonconformance. The third improvement is the preventive action to eliminate the causes of a potential nonconformance.

There are several factors related to head nurses' management regarding patient safety. These can be divided into two major factors: personal factors and environmental factors as detailed below.

Head nurses' personal factors are the factors that directly relate to the head nurse: age, level of education, and working experience.

Age. Age is an indicator of maturity and capability in managing the environments, mentalities, perceptions including the ability to understand and make a decision in performing behavior. A head nurse carries personal responsibility for nursing practice and for maintaining a competency level in managing wards in order to improve patient safety.

Level of education. Level of education is important skill preparedness for nurses that can improve head nurses' ability in managing patient safety. Some studies found no significant association between nurse education and patient safety (Ridley, 2008). In contrast, another study found a positive relationship between educational level and patient safety (Person et al., 2004).

Years of experience as head nurse. Working experience is a crucial element for every profession especially in nursing. Benner (2011) explained stages of skill development process. A nurse passes through five levels of proficiency, from novice, advanced beginner, competent, proficient, to expert. 1) The novice or beginner has no experience in the situations in which they are expected to perform. The novice lacks confidence to demonstrate safe practices and requires continual

verbal and physical cues. 2) Advanced beginners demonstrate marginally acceptable performances because the nurse has had prior experiences in actual situations. They are efficient and skillful in parts of their practice area, requiring occasional supportive cues and their knowledge is developing. 3) Competence is demonstrated by the nurse who has been on the job in similar situations for two or three years. The nurse is able to demonstrate efficiency, is coordinated and has confidence in their actions. 4) The proficient nurse perceives situations as wholes rather than in terms of chopped up parts or aspects. Proficient nurses understand a situation as a whole because they perceive its meaning in terms of long-term goals. The proficient nurse learns from experience what typical events to expect in a given situation and how plans need to be modified in response to these events. 5) The expert nurse has an intuitive grasp of each situation and zeroes in on an accurate region of problems without wasteful considerations of a large range of unfruitful, alternative diagnoses and solutions. The expert operates from a deep understanding of total situation. His/her performance becomes fluid, flexible and highly proficient. A highly skilled, analytic ability is necessary for those situations with which the nurse has had no previous experience.

Type of nursing delivery. Type of nursing delivery refers to methods within a unit that is applied by a head nurse. There is a different type of nursing delivery between one unit and other units. All types of nursing delivery are different in terms of the environmental setting, goal of care and ratio of nurses to patient. The conceptual framework of this study is summarized in the following Figure 1.

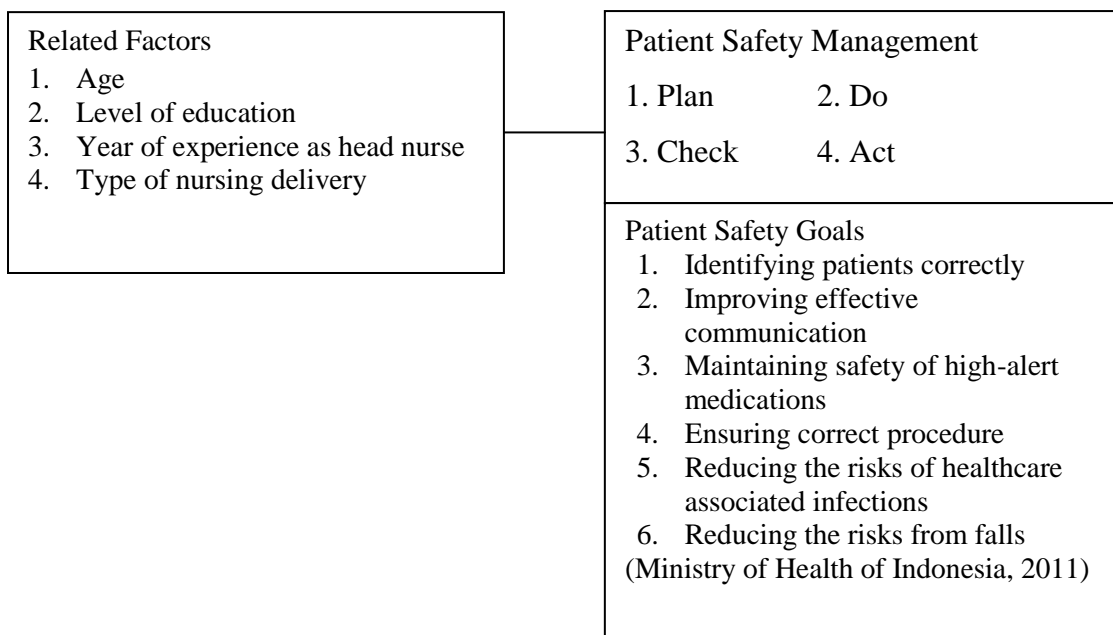


Figure 1

Conceptual Framework of Head Nurses' Management and Its Related Factors Regarding Patient Safety

Hypotheses

There are relationships between age, level of education, working experience, type of nursing delivery and head nurses' management regarding patient safety in public hospitals in Aceh province, Indonesia.

Definition of Terms

Head Nurses' Management Regarding Patient Safety

Head nurses' management regarding patient safety refers to the actions of head nurses in managing system through identifying, analyzing, setting units,

guaranteeing correct procedures, and prevention of mistakes during working hours using the PDCA cycle as a framework. Head nurses apply the PDCA model regarding patient safety based on six patient safety goals established by the Ministry of Health, Indonesia. This safety management will be measured by the amount of action or the extent to which head nurses perform regarding safety from the questionnaire developed by the researcher based upon those six patient safety goals.

Plan. Plan refers to head nurses' efforts to identifying, setting goals, setting guidelines, setting the indicators, analyzing the problems and establishing the objectives and processes of patient safety that are necessary to deliver results in accordance with the six patient safety goals.

Do. Do refers to head nurses' efforts in implementing the plan, emphasizing responsibility, clear explanation of the staff's duties, encouragement of the staff and execution of the process; head nurses create a safe unit for patients in accordance with six patient safety goals.

Check. Check refers to head nurses' effort in analyzing results, monitoring staff, auditing programs and modification of plans for realizing implementation. The head nurse will check the process and actual results that have been collected in the "do" step and compare them against the expected results goals from the "plan" step to ascertain any differences. Head nurses also look for deviations in the implementation of the plan and look for the appropriateness and completeness of the plan to enable execution at the "do" step. Head nurses also record the data in order to convert the collected data into information for the next step.

Act. Act refers to head nurses' effort in evaluating the program, supervising staff, revising the program or guidelines and training and corrective actions pertaining to significant differences between actual and planned results. Head

nurses will analyze the gaps to determine their root causes, and apply changes that will enable improvement of the process.

Related Factors

Related factors refers to head nurses' age, level of education, working experience and type of nursing delivery.

Age refers to the personal age of a head nurse that works in an inpatient ward.

Level of education refers to the highest formal education of a head nurse.

Year of experience as head nurse refers to the number of years working as a head nurse.

Type of nursing delivery refers to head nurses' methods that applied in the unit. There are three common types that are applied in wards: functional, team, and mixed functional and team.

Scope of the Study

This study was conducted to explore head nurses' management for patient safety and its related factors in public hospitals located in Aceh Province, Indonesia during January to March 2013.

Significance of the Study

The results of this study will be useful for appropriate planning to improve nursing service, nursing curricula, teaching and improving the nursing process in patient safety and patient safety management. It can provide information for administrators to develop hospital policies in providing patient safety and quality of care. Moreover, the results of this study provide preliminary information for further study regarding patient safety management, especially in Indonesia.

CHAPTER 2

LITERATURE REVIEW

Overview of Patient Safety

 Definition of Patient Safety

 Dimensions of Patient Safety

Patient Safety Goals

 Identifying Patients Correctly

 Improving Effective Communication

 Maintaining the Safety of High Alert Medications

 Ensuring Correct Procedure

 Reducing the Risk of Healthcare Associated Infections

 Reducing the Risk from Fall

Incident Report in Patient Safety

The Common Methods of Measuring Patient Safety

Head Nurses' Management Regarding Patient Safety

 Model to Achieve Patient Safety

Head Nurses' Management (PDCA model) for Patient Safety

Factors Related to Head Nurses' Management Regarding Patient Safety

Context of Public Hospitals in Indonesia

Summary

Overview of Patient Safety

Around the world, health care providers have become concerned with improving the quality of care, including safety, effectiveness, appropriateness, access, efficiency and acceptability of that care. Some important evidence demonstrating the importance of safety and quality health care including the Australian international seminar report and in particular the Australian Healthcare Study from the Institute of Medicine which states that patient safety is the biggest issue in health care. Studies in the United States, Australia, and the United Kingdom show that between 4% to 16% of patients admitted to hospital have experienced one or more adverse event. Errors or adverse events not only increase patient suffering and deaths but also decrease patient satisfaction and increase financial costs (Government of Ireland, 2008). Furthermore, Kohn, Corrigan, and Donaldson (2000) cited that the Institute of Medicine (IOM) estimated at least 44,000 people and perhaps as many as 98,000 people in the United States die in hospital every year as the result of preventable medical errors.

Patient safety also involves the reporting, analysis, and prevention of medical error that often causes adverse events in healthcare. Before the 90s, data was under-reported and gained less attention. Based on the report from various countries, at least 1 out of 10 patients around the world had been harmed or had died as a result of medical error (Regenstein, 2004).

Definition of Patient Safety

The IOM's report in 1999 was a milestone for the modern patient safety movement. The IOM has defined patient safety as freedom from accidental

injury (Kohn, Corrigan & Donaldson, 2000). Emanuel et al. (2008) provide further detail on definition of patient safety as a discipline in the healthcare sector that applies to safety science methods toward the goal of achieving a trustworthy healthcare delivery system. Patient safety is also an attribute of healthcare systems that maximizes recovery from adverse events and minimizes incidents or impact.

Studying patient safety, many terms are used to describe unintended harm to patients in the process of healthcare delivery: adverse events, medical errors, injuries, sentinel events, healthcare associated risks, and hazards (Kellogg & Havens, 2003). Patient safety refers to the provision of treatment in healthcare that results in the improvement of patients' conditions without causing harm to them. The definition of patient safety shows how nurses understand safety as well as what is necessary to be done to ensure safety for patients and the efforts to improve it (Sundt, Brown, & Uhlig, 2005). An extensive number of patient safety definitions can be found in the literature. Patient safety can be defined as the protection from experiencing or causing harm, injury, or damage that can lead to risk (Australian Institute of Health and Welfare, 2011).

The definitions of patient safety are described above and emphasize some aspects on patient safety. It is possible to separate these definitions in two groups, namely, procedure, management of control and outcome of patient safety. The first group identified patient safety as a dynamic property of the healthcare system that emerges from the interactions of several elements. These kinds of definitions treat incidents as resulting from the ineffective healthcare practice. The second group understands safety as freedom from harm as a result from the implementation of protection measures like procedures and safe technology (Macchi, Pietikäinen, Reiman, Heikkilä, & Ruuhilehto, 2011).

Definition of patient safety is concrete but quite incomplete because many words refer to the negative outcomes of lack of patient safety. The National Quality Forum attempted to bring clarity and concreteness to the multiple definitions in their report standardizing patient safety taxonomy. Taxonomy defines harm as the impact and severity of a process of care failure. Emphasis on patient safety is (1) responsibility placed on the system of care delivery by classifying types of errors, (2) adequate communication between patient or patient proxy and practitioners, practitioner and nonmedical staff, or among practitioners, (3) patient management in the ward, delegation, or referral, and (4) clinical performance before, during, and after intervention.

Dimensions of Patient Safety

Some scholar said that the sphere of patient safety includes seven steps and 12 dimensions. The 12 dimension of patient safety as stated by the Agency for Healthcare Research and Quality are as follows: dimension 1) teamwork within units, dimension 2) supervisor/manager expectation and action promoting patient safety, dimension 3) managing support for patient safety, dimension 4) organizational learning for continuous improvement, dimension 5) overall perception of patient safety, dimension 6) feedback and communication about safety, dimension 7) communication openness, dimension 8) frequency of events reported, dimension 9) teamwork across unit, dimension 10) staffing, and dimension 11) handoffs, transition and non-punitive response to error (Agency for Healthcare Research and Quality, 2010).

Some steps of patient safety for primary care mentioned by the National Patient Safety Agency (2006) are as follows: step 1- build a culture of safety by creating a culture that is open and fair; step 2 - lead and support staff to establish a clear and strong focus on patient safety; step 3 - integrate the risk management activity to develop systems and processes to manage risks, as well as the identification and assessment of things that could go wrong; step 4 - promote reporting to ensure staff can easily report incidents locally and nationally; step 5- involve and communicate with patients and the public to develop ways to communicate openly with patients; step 6- learn and share safety lessons to encourage staff to use root cause analysis to learn how and why incidents happen; lastly, step 7 - implement solutions to prevent harm by embedding lessons on changes in practices, processes or systems.

A large number of people being treated and cared for in healthcare institutions are patients with high risk potential among others because complex treatments sometime go wrong or near miss and as a result patients are harmed. Seven steps of safety for primary care provide guidance for caregivers and they are also very essential for those staff who are responsible for clinical, risk management and managing staff (National Patient Safety Agency, 2006).

Build a safety culture

One of the characteristics of a safety culture is a shared perception about the concern for safety among managers and staff (Feng, Bobay, & Weiss, 2008). The implementation of a safety culture in the healthcare system is very important, safety applies not only to the caregiver but also to the patients who are treated by the staff (Flin & Yule, 2004). Safety culture is one in which safety is

everyone's concern and there is an acknowledgement that error can and will occur. Moving toward patient safety culture involves a cultural change in nursing healthcare system, which will lead to quality and will respond to patient's needs (Milligan & Dennis, 2005).

Safety culture is very important to build in hospitals because there is a culture of blame that exists in hospitals (Milligan & Dennis, 2005). Study of Berwick and Leape (1999) on the comparison between safety culture in aviation and safety culture in healthcare show significant differences in safety culture and that safety culture in aviation is better than in healthcare. Implementing a safety culture in healthcare will be beneficial for patients, caregivers, hospitals and will also help reduce cost.

Safety must be a top priority in healthcare organization; safety culture will provide a comfortable atmosphere for staff to openly discuss errors, process improvement or system issues without fear of reprisal. Characteristics of patient's safety culture include open and honest communication, emphasis, supportive and helpful staff, trust among staff, focus on work-flow and process. To build patient's safety culture, AORN created a patient centric safety culture consisting of five major subcultures, reporting, learning, wary or vigilant, flexible, and just.

Lead and support staff

Everyone in the healthcare system is affected by patient safety. A basic part of leading and supporting staff is a strong leadership in organization from the top level with a clear vision and policy on safety. The key principles of leading and supporting staff are delivering motivation to the staff, commitment, and continuous improvement. The manager at the top of the organization should have a high

motivation and commitment to deliver a patient safety agenda. The manager should also show safety as a priority and be active in improving patient safety (National Patient Safety Agency, 2006).

Integrate the risk management activity

Risk management is a crucial part of the third process because it addresses quality issue and delivers appropriate standard of care. Developing an integrated governance approach and an integrated risk management system will improve patient safety. Integrated risk management means lesson learned in one area of risk can be quickly disseminated to other areas of risk. Integration and management of all risks will assist primary care organization, including practice in complying with a clinical target (National Patient Safety Agency, 2006).

Integrated risk management activities are very important to learn because incidents involving patient safety are unpredictable, and human errors can never be eliminated entirely. Systematically identifying, assessing, learning from and managing all risk and incidents at every level will help reduce the potential of and actual risk, and help identify opportunities to improve health care and patient safety. Integrating risk management as described can increase the likelihood of achieving the desired objective and outcomes. Integrated risk management not only focus on the reduction of risk but also supports, fosters innovation, improves organization resilience and flexibility in the face of uncertainly. With effective integrated risk management processes, the weaknesses, vulnerability of procedures, practices or policies will be identified(National Patient Safety Agency, 2006).

Promote reporting

The way to identify the total number of incidents in health care is to set up a reporting system that is also fundamental in improving patient safety. Reporting patient safety and prevented incidents nationally provides the opportunity to ensure that the lesson gained from the experience of a patient in one part of healthcare services is used to reduce the risk of something similar happening to future patients. Besides that, reporting in the healthcare system is highly complex (National Patient Safety Agency, 2006).

Reporting systems are used to collect information on both adverse events and errors. Adverse events have been defined as injuries related to medical management. Preventable adverse events are those that result from errors or equipment failure. A good internal reporting system ensures that all responsible parties are aware of major hazards. Reporting is also important for monitoring progress in the prevention of errors (Leape, Epstein, & Hamel, 2002). Furthermore, when an adverse event occurs, it is reported to the administration, an investigation is then carried out to uncover the causes, and changes are made to prevent a recurrence (Vincent et al., 2000). The results of the investigation are then further reported to an external body, which aggregates and analyzes data from multiple sources and disseminates information broadly. External reporting can lead to improved safety in several ways. First, it alerts of new hazards. Second, information about the experience of individual hospitals in using new methods to prevent errors can be disseminated. Third, central analysis of many reports can state trends and hazards that require attention and fourth, central analysis can lead to recommended best practices for all to follow (Flowers & Riley, 2001).

Involve and communicate with patients and the public

Effective communication between team members and patients is one of the hallmarks of safety and highly reliable patient care(Kohn et al., 2000). Involving and communicating openly with patients and their family is essential in improving patient safety. Furthermore, the risk of health problems decreases when patients take responsibility for their own health and safety (National Patient Safety Agency, 2006). Nurses who are highly reliable and hold patient safety, respect, attentiveness, communication, and competence, as central values; furthermore, high reliability requires nurses and teams to constantly scan for, detect and correct evolving safety threats, and adapt to dynamic conditions appropriately. Every team member is accountable for communicating and stating their concerns with persistence until there is a clear resolution. In addition, team leaders must be clear about the reasoning for specific courses of action and demonstrate openness to inputs from all team members by soliciting and reflecting on team member perspectives(Lyndon, Zlatnik, & Wachter, 2011).

Nurses, as primary caregivers, have to involve patients and the public in developing safer service, because many patients know their own condition and this expertise can be harnessed to help identify risks and device solutions to patients' safety problem (National Patient Safety Agency, 2006). Moreover, effective communication for patients starts from the beginning their health e assessment and continues throughout the entire nursing care. For nurses, there is an ethical responsibility to maintain honest communication with patients, their family, and public, even when things go wrong, by ensuring that there is good communication when an adverse event occurs, we can begin to look at ways to prevent them from recurring(Australian Council for Safety and Quality in Health Care, 2008).

Encouraging open communication between nurses and patients during the nursing care processes and when incidents go wrong is fundamental to partnership. Open communication and honesty about what has happened and discussing the problem promptly and in detail, can help patients cope better with the effect of something going wrong (Crane, 2001). Additionally, openness and honesty can also help prevent such incidents from causing a formal complaint and litigation claim.

Learn and share safety lessons

When an incident that endangers patient safety occurs, the crucial issue is not to blame who caused the incident but to find the reason for it. In other words, understanding why the incident occurs is an essential part of the investigation and is fundamental in ensuring that the incident is not repeated (National Patient Safety Agency, 2006).

Implement solutions to prevent harm

Translating lessons from patient safety incidents into practical solutions for change and ensuring that patient safety is embedded into the culture and routine practice of primary care, practice and team is the solution to creating safer in healthcare (National Patient Safety Agency, 2006).

Patient Safety Goals

National Patient Safety Goals were first developed by The Joint Commission in 2002, after the Institute of Medicine identified medical errors as one of the nation's highest healthcare priorities (Kohn, Corrigan, & Donaldson, 2000). McMaster (2008) mentioned National Patient Safety Goals have been widely

endorsed and adopted by organizations around the world. The National Patient Safety Goals are derived from informal recommendations made by patient safety experts including nurses, physicians, risk managers, pharmacists, and other professionals having practical experience in promoting safety issues. The panel of experts' uses sentinel event information, other available databases, and literature to identify and update safety issues to be addressed.

Furthermore, patient safety goals as a condition to be applied in all hospitals are accredited by the Commission on Accreditation of Hospitals. Joint Commission International (JCI, 2011) published international patient safety goals consisting of 6 key items, 1) Identify Patients Correctly, 2) Improve Effective Communication, 3) Improve the Safety of High-Alert Medications, 4) Ensure Correct-Site, Correct-Procedure, Correct-Patient, 5) Reduce the Risk of Health Care-Associated Infections and 6) Reduce the Risk of Patient Harm Resulting from Falls.

Identifying Patients Correctly

Identifying patients accurately presents many unique challenges in today's health care settings. Concern for proper patient identification is evidenced in the 2003 National Patient Safety Goals. One of the six identified goals is to improve the accuracy of patient identification. The recommendation is that at least two patient identifiers (not including the patient's room number) should be used when blood samples are obtained or when medications or blood are administered. The second recommendation relates to conducting a final verification during in which active communication is used to confirm the patient's identity before the start of a procedure (Joint Commission International, 2011).

World Health Organization Collaborating Center for patient safety solutions recognized that failure to correctly identify patients constitutes one of the most serious risks to patient safety and cuts across all sectors of healthcare practice (World Health Organization, 2007). National Patient Safety Agency (NPSA, 2004) stated that one of three main types of errors is failure to identify the patient correctly. Reducing and eliminating error when matching the patient to their care is central to improving patient safety. More specifically, Henneman et al. (2008) cited that patient identification errors are the root cause of medication, surgical, charting, dietary, and other medical errors. The failure to correctly identify a patient can result in serious subsequent errors.

Improving Effective Communication

Communication is central to human interaction. People relate to those around them through communication by making their needs and concerns known or through making sense of what is happening to them (Casey & Wallis, 2011). Communication is one of the most basic skills needed by nurses, in other words, communication in nursing is fundamental to every interaction. Nurses routinely collaborate with physicians, interact with allied health caregivers, supervise assistant personnel, and coordinate services across the health care continuum in their role responsibilities (Apker, Propp, Zabava Ford, & Hofmeister, 2006). Without ability to communicate, the consultation would probably never occur in the first place and the process would never reach an affective conclusion. Communication has many attributes at its core such as in imparting information (Peate, 2010).

Furthermore, nurses are at the heart of the communication process. The impact of communication failure with a patient will right away destroy the nurse / patient relationship, which means the patient may not be able to trust the nurse. Communication failure is also the leading cause of inadvertent patient harm (Leonard, Graham, & Bonacum, 2004). In communication process, nurses assess, record and report on the treatments and care, handle information sensitively and confidentially, deal with complaints effectively, and are conscientious in reporting the things they are concerned about (Blizard, 2012).

Poor communication can even be dangerous as misunderstandings and people getting their wires crossed can lead to misdiagnosis and even medication errors. The barriers to good communication skills are many: Busy nurses may not have time to sit and talk with patients or there could be a lack of privacy. The nurses' skill sets may differ in the ward creating a shortage of qualified nurses who are available to talk to patients and language is also a barrier (Middleton, 2007). A study by the Joint commission Resource for Hospital Accreditation reported that the prime root cause in over 70% of 2455 events reported was communication failure (Joint Commission Resources, 2008).

In nursing practice, useful things to remember in having good communication include being prepared to know what you are going to say; having the right information to hand for when patients ask questions; maintaining eye contact and observing the patient's body language; listening properly; picking up on the non-verbal signs as well as the verbal ones; avoiding the use of medical jargon; and in cases of breaking bad news, being prepared emotionally, trying to find the right environment, and being sensitive, honest and compassionate (Middleton, 2007).

The communication between nurses and patients not only has to be good but also needs to be effective. Effective communication skills can also be particularly helpful when patients complain. Patients usually see nurses as more approachable than doctors if they have a problem they want to discuss. Nurses can often deal with complaints quickly and effectively before they are taken further and prevent what was initially a minor problem from becoming a long, drawn-out formal complaint (Casey & Wallis, 2011).

The National Patient Safety Agency identified communication difficulties as a major factor affecting patient outcomes. Particular concerns included unclear documentation and nurses not being clear and confident in their reporting (National Patient Safety Agency, 2006). There are several tools used in healthcare such as the handover tool, do not use list tool, SBAR tool, safe handover tool, surgical safety tool, DASH debriefing tool, and team self reviewing and debriefing (WHO, 2009).

However, the World Health Organization collaboration for patient safety solution (WHO., TJC., & JCI., 2007) recommends the use of the SBAR (Situation, Background, Assessment and Recommendation) tool to standardize communications in healthcare. The SBAR involves first clarifying the problem, then giving pertinent background information; follow by assessment of the situation and a recommendation. This has added benefit of allowing professional groups who have been taught to communicate in very different styles, to have a common language (WHO, 2009). A study demonstrated that the SBAR tool improved the quality of telephone referrals to the critical care outreach team, greatly reduced the time for shift handovers and helped reduce adverse patient outcomes (Christie & Robinson, 2009).

Maintaining the Safety of High Alert Medications

Errors are bound to occur in the practice of medicine given its complexity and noting that most of those errors are not the result of negligence. Ethicists have long espoused that physicians have an obligation to be truthful and to disclose information about medical mistakes to their patients. According to Kaushal, Bates, and Landrigan(2001) medication errors are defined as errors in drug ordering, transcribing, dispensing, administering, or monitoring. Which includes medications omitted, given at the wrong time, given to the wrong patient, the wrong dose, the wrong medication, the result of a transcription error, given to a patient with a known allergy, repeated without an order, given by the wrong route, and discontinued without an order.

A prescribed medicine is the most frequent treatment provided for patient in National Health Service (Jim, 2004). However, medication error has been identified as one of the most common threats to patient safety in healthcare service (Ahmed, Arora, Carley, Sevdalis, & Neale, 2012). Furthermore, Taxis and Barber (2003) stated that in the hospital, at least one patient experiences a potentially serious drug error every day. In terms of costs Jim, (2004) showed that the cost to the National Health System is £400 million per year. Furthermore, a cost-benefit analysis showed that net benefits from lowered incidence and decreased workers' compensation claims was \$200,000 per year (Siddharthan, Nelson, Tiesman, & Chen, 2005).

Medication error also arises in drug selection, prescribing, dispensing, administration and therapeutic monitoring (Yu, Hou, & Chiang, 2010). The UK Department of Health has set out key steps to minimize the risk of error at all stages

of the medication process to build on the government's aim of reducing serious errors in prescribed drugs (Department of Health, 2004). Besides that, Medication usage is a multidisciplinary process, which begins with the doctor's prescription, followed by the review and provision of medications by a pharmacist, and ends with the preparation and administration of the medication to the patient by a nurse (Khowaja, Nizar, Merchant, Dias, Bustamante & Malik, 2008)

In order to minimize the medication error and to ensure patients' safety, healthcare professionals need to develop and maintain an ongoing process that uncovers potential risk while promoting ways to eradicate vulnerability to error (Peate, 2010). In turn, to accomplish these tasks, the healthcare system needs to provide resources to monitor and evaluate errors and to implement methods to reduce them. In nursing care, nurses, as the last party responsible to prepare and administration of patient's medicine, should document the actual administration of medication on the medical administration record (MAR). The MAR contains the drug's name, dose, route, and frequency of administration (White, 2005).

The drugs data procedures are entered by the pharmacist when dispensing the order or by nurses when transcribing the order. Nurses have the responsibility to improve the safety of medications and to provide extra attention in high-alert medication. Nurses should know the five rights in safe medication, as follows (1) the right medication, (2) the right patient, (3) the right time, (4) the right dose, (5) the right route (Peate, 2010).

The right medication. The label in the container should be checked against the prescription chart to ensure that it is the correct prescribed medication. In addition, medication should only be dispensed from the original container. Any

instructions pertaining to the medication such as the expiry date should also be noted. Nurse, as the person dispensing the drugs has to be familiar with the drug's basic information, any contraindications and side effects (Peate, 2010).

The right patient.A nurse's priority in delivering the medication is in checking that the right patient receives it. Checking the patient's identification bracelet and asking them to state their name are two right methods of patient identification (Peate, 2010).

The right time.In order to maintain a constant blood plasma level of drug at an effective range, it is important to give the drug as close to the prescribed time as possible. Similarly, certain drug needs to be given before, with or after a meal, in order to maximize the drug's effect. Therefore, it is important that this is adhered to and that an explanation is given to the patient in order to ensure compliance with the drug regimen (Peate, 2010)

The right dose.When the drugs are prescribed at different required strengths, it is important that the right amount of drug is calculated and this will require a basic knowledge of arithmetic. Similarly a calibrated medicine pot or syringe may be required for liquid medication or injectable preparation. When there is a doubt in the amount of the dose to be given or a complicated calculation is required, this should be double checked with another health professional (Peate, 2010)

The right route.Drugs may be administered in a number of ways including by mouth, rectally, via injection either intramuscularly or intravenous, topically or via inhalation, but all the possible routes cannot administer all drugs. Indeed some medication can prove fatal if given via the wrong route. Therefore, it is important to check the route of administration prior to administration (Peate, 2010).

Ensuring Correct Procedure

Surgery is one area of health care in which preventable medical errors and near misses can occur. Furthermore, the great concern in surgery is wrong-site surgery (WSS), which encompasses surgery performed on the wrong side or site of the body, wrong surgical procedure performed, and surgery performed on the wrong patient. This definition also includes “any invasive procedure that exposes patients to more than minimal risk, including procedures performed in settings other than the OR [operating room], such as a special procedures unit, an endoscopy unit, and an interventional radiology suite (Leape, Epstein, & Hamel, 2002).

Wrong site surgery is generally caused by a lack of a formal system to verify the site of surgery or a breakdown of the system that verifies the correct site of surgery. Hughes (2008) mentioned the Joint Commission found the top root causes of error in surgery due to communication failure (70%), procedural noncompliance (64%), and leadership (46%).

Preoperative verification of the correct person, procedure, and site should occur: a) at the time the surgery/procedure is scheduled, b) at the time of admission or entry into the facility, c) anytime the responsibility for care of the patient is transferred to another caregiver, d) with the patient involved, awake, and aware, if possible, e) before the patient leaves the preoperative area or enters the procedure/surgical room. A preoperative verification checklist may be helpful to ensure availability and review of the following, prior to the start of the procedure.

Preparation before patient receive operation, patient should be marked the operative site following 1) Make the mark at or near the incision site, 2) The mark must be unambiguous, 3) the mark must be positioned to be visible after the patient is prepped and draped, 4) the mark must be made using a marker that is sufficiently

permanent to remain visible after completion of the skin prep. Adhesive site markers should not be used as the sole means of marking the site, 5) the method of marking and type of mark should be consistent throughout the organization, 6) at a minimum, mark all cases involving laterality, multiple structures (fingers, toes, lesions), or multiple levels (spine), 7) the person performing the procedure should do the site marking, 8) marking must take place with the patient involved, awake, and aware, if possible, 9) final verification of the site mark must take place during the time out, 10) defined procedure must be in place for patients who refuse site marking.

Reducing the Risk of Healthcare Associated Infections

Healthcare associated infections are infections acquired as a consequence of a person's treatment by a healthcare giver in the course of their duties (Leigh, 2009). They are often identified in a hospital setting, but can also be associated with medical care delivered in the community. These infections arise from micro-organisms that people carry safely on their skin or in their body, and only become a problem when the organisms have an opportunity to breach the body's natural defenses, for example, an open wound, catheterization or intravenous devices.

Healthcare associated infections (HAIs) are one of the most serious patient safety issues in health care today. Infections present a hazard and a risk for both patient and healthcare provider (Peate, 2010). Indeed, they are the fifth leading cause of death in acute-care hospitals (Klevens, Edwards, Richards, Horan, Gaynes, Pollock & Cardo, 2007) and the third most common cause of death in United States (Welsh, Flanagan, Hoke, Doebbeling & Herwaldt, 2011). Between 5% and 15% of hospital inpatients develop an infection during their admission, and critically ill, ICU patients are 5 to 10 times more likely to acquire an HAI than those in general wards

(Klebens, Edwards, Richards, Horan, Gaynes, Pollock&Cardo, 2007). Furthermore the number still increase, around 5-10% of patients in hospitals in developed countries get HAIs, but the risk is 2-20 times higher in poorer countries (Morris, 2008).

In order to minimize the infection risks, principle of infection prevention and control must be implementing and adhered by all concern. Therefore in seeking to reduce the risk of healthcare associated infection (HCAI), both environmental and clinical factors need to be considered (Health Protection Agency, 2009).

Environmental cleaning. Any healthcare environment presents an infection risk to patient and nurses such as dust, soil and organic matter which are potentially infectious, quickly accumulate in the environment if it is not properly and regularly cleaned. Cleaning procedures should concentrate on areas with greater environmental risk, such as toilets, patient beds, lockers and kitchens. Maintaining high standards of environmental cleaning is a key in preventing and the spread of infection (Johnson, 2008).

Linen handling. Used linen is a potential infection risk especially if it is contaminated with body fluids or has been used in the care of patient with an infectious disease. Health service used linen must be washed at the highest possible temperature, quickly tumble dried and ironed to ensure those microorganisms are destroyed (Peate, 2010).

Personal protective equipment. The correct use of personal protective equipment (PPE) is an essential component of safe practice and helps minimizes hazard exposure. The context of infection prevention and control, PPE includes disposable gloves, disposable aprons, eye protection, mouth protection, food protection, and fluid repellent gowns (Peate, 2010).

Hand washing. Hand washing is emphasized as a basic measure to prevent infections. Hand hygiene means either washing the hands with soap and water or hand antiseptics with an alcohol-based hand-rub (Takahashi, Osaki, Okamoto, Tahara, & Kishimoto, 2009). Furthermore hand washing has been identified as the most effective and immediate way to controlling nosocomial infections in patients, and especially for patients in intensive care. Frequency, duration, technique, amount of soap liquid, the type of antimicrobial health care personnel use for hand wash (active ingredient), and the clinical setting have been identified as factors in the effectiveness of hand washing as a method of controlling potential hospital acquired infection for your patients and nurses (Feldstein, Smith, Robertson, Kovach, Soumerai, Simon et al., 2005).

Both patients and nurses carry microorganisms, in the form of bacteria and species of fungi on their skin, hair and hand/forearm surfaces and under their nails. During hospitalization, some of the infections acquired by patients will be caused by microbes spread on the hands of nurses. The human eye cannot detect these microorganisms entering into the patient bodies (Feldstein, Smith, Robertson, Kovach, Soumerai, Simon et al., 2005). Most published research and publications over the last 15 years continue to stress the importance of hand washing during patient care.

However, the rate of compliance with hand hygiene in medical practitioners is low, and the US Centers for Disease Control and Prevention (CDC) published a guideline for hand hygiene in healthcare settings in an effort to promote it (Takahashi, Osaki, Okamoto, Tahara, & Kishimoto, 2009).

A study in Japan show that situations in which nurses neglect to wash their hands were classified as typical situations that nurses are confronted by every

day. Busy with duties (55.1%), particularly during the night; emergencies and urgencies; and moments of disorganization all contribute to the neglect in hand washing. Few nurses in a ward and inadequate hospital design may be aggravating factors. Repetitive actions (10.4), such as diaper changes, carelessness and lack of attention also lead to the neglect of conscientious hand washing (Suzuki, Mori, Onose, Nakamura, Yamanishi, Kudo et al., 2002).

Reducing the Risk from Fall

Fall is the most frequently reported critical incident in acute care inpatient hospitals (Carroll, Pappola, & McNicoll, 2009) and mostly in the elderly population (Miller, Wightman, Rumbolt, McConnell, Berg, Devereaux & Campbell, 2009). Patient falls represent over one-third of incidents reported in hospitals (National Audit Office [NAO], 2005) and they are the largest single category of reported hospital adverse events (Tiedemann, Murray, Munro, & Lord, 2008). There are significant costs associated with patient falls, including patient care costs (Tiedemann, Murray, Munro & Lord, 2008), and increased length of stay (Koh, Hafizah, Lee, Loo, & Muthu, 2009). With approximately 2% to 7% of acute-care hospitalized patients experiencing at least one fall during their stay (Carroll, Pappola & McNicoll, 2009).

Researchers and health care institutions have placed prioritization on the development and implementation of in-hospital fall prevention strategies and programs. As a result numerous fall risk assessment tools have been developed to identify patients at risk of falling in hospitals as well as the implementation of a wide range of hospital-based fall prevention programs (Ko, Nguyen, Chan, Shen, Ding, Chan et al., 2011). While there is a growing body of literature on fall prevention in

the hospital, the data examining the fall rate and risk factors for falls in the immediate post-hospitalization period has not been well described (Davenport, Vaidean, Jones, Chandler, Kessler, Mion, & Shorr, 2009).

The national service framework (NSF) for older people identifies fall prevention as a priority as stated in key standard six (Peate, 2010). Death, injury, increase independency and impaired self care are possible physical consequences of a fall, the psychological effects such as fear of falling and loss of confidence in being able to move about safely and also be harmful.

Incidences of patient fall are more likely to as the population ages, particularly when many elderly patients have physical and cognitive limitations and are unfamiliar with the surroundings in the hospital. As a caregiver, it is important to know that falls are the leading cause of death in hospitalized people of 65 years of age or older. Falls are the most commonly reported adverse event.

Incident Report in Patient Safety

The number of adverse events and medical error during hospitalization is a healthcare outcome however identifying adverse events and attributing cause to error is difficult. The starting point of error in healthcare begins with incorrect patient identification. Error when identifying patients is a potentially serious risk to patient safety. Before an intervention is performed the patient must be identified correctly to ensure that the intervention is on the correct patient. Asking for patient history and selecting medical records is the verification process should be performed. A study of Henneman (2008), which was a prospective study, used simulated scenarios with an eye-tracking device and found that 2 of 25 providers noted the DOB

error, 1 of 25 noted the last name error; 12 ordered tests on an incorrect patient, no participant verified patient ID by looking at MRN prior to selecting a patient from the alphabetical list.

Besides that, another common error in healthcare is medication error. A study of Elder, Vonder, and Cassedy (2004) found 24% of 351 errors and preventable adverse events were due to medication error. There was wide variation in how often individual physicians identified errors. Office administration errors were most frequently noted. Harm was believed to have occurred as a result of 24% of the errors.

Healthcare associated infection is the third incident of adverse events in hospital. Study of Eber, Laxminarayan, Perencevich, and Malani (2010) mentioned health care associated sepsis and pneumonia in both invasive surgery and elective surgery. Furthermore a survey of adult patients was conducted in acute hospitals in four countries across England, Wales, Northern Ireland and the Republic of Ireland to estimate the prevalence of healthcare-associated infections (HCAIs). A total of 75694 patients were surveyed; 5743 of these patients had HCAIs, giving a prevalence of 7.59% (95% confidence interval: 7.40–7.78). HCAI prevalence in England was 8.19%, in Wales 6.35%, in Northern Ireland 5.43% and in the Republic of Ireland 4.89%. The most common HCAI system infections were gastrointestinal (20.6% of all HCAI), urinary tract (19.9%), surgical site (14.5%), pneumonia (14.1%), skin and soft tissue (10.4%) and primary bloodstream (7.0%) (Smyth, McIlvenny, Enstone, Emmerson, Humphreys, Fitzpatrick et al., 2008).

Reporting is one method to monitoring progress in the prevention of errors, hazard and adverse event. An adverse event is reported to the hospital administration, investigation is carried out to uncover the causes, and changes are

made to prevent a recurrence (Leape, 2002). A more accurate assessment of the incidence and severity of errors and preventable adverse events in primary care is necessary to develop successful interventions to improve patient safety.

The Common Methods of Measuring Patient Safety

The most common methods used for measuring patient safety are retrospective medical chart review, incident reporting systems, automated surveillance, and administrative or claims data. Retrospective medical chart review remains the "gold standard" for identifying adverse events. Although medical records contain detailed clinical information on patients, and often contain information about the safety events and the circumstances surrounding it, using them to systematically detect and measure safety events is not practical. Medical record reviews, particularly when the records are paper based rather than electronic, are costly, labor-intensive, and typically involve one or more clinicians (Aspden, Corrigan, Wolcott, Shari & Erickson, 2004). The quality of medical records varies and important clinical information related to an event that endangers patient and/or the patient's clinical history might be missing. The transfer of patients between systems, lack of staff training or experience in documenting patients' charts, or systems' failures in retrieving complete information from patients' visits, ancillary services, or other data sources, might contribute to this variability (Aspden, Corrigan, Wolcott, Shari & Erickson, 2004). After data are extracted, they need to be transformed into a research database, generating additional costs and labor.

Incident reporting systems are increasingly being used at the private-sector as part of its internal safety improvement programs (Aspden, Corrigan,

Wolcott, Shari& Erickson, 2004). These systems gather retrospective information on safety events, primarily relying on self-reports by providers. Techniques such as root cause analysis are then used to understand the cause and contributing factors associated with the event (Pronovost, Goeschel, Marsteller, Sexton, Pham&Berenholtz, 2009). However, the usefulness of incident reporting systems for measurement of safety events on a national basis is limited (Aspden, Corrigan, Wolcott, Shari& Erickson, 2004) Incident reports are not generated automatically, unless an information technology infrastructure is present, making data collection cumbersome and costly. Because there are no uniform standards for reporting, systems differ on the types of events reported and on the information collected, preventing accurate measurement of safety events, and making aggregation and comparison of data across systems untenable. Furthermore, event reporting is variable, depending on whether or not a provider chooses to use the reporting system. Thus, these reporting systems capture only a small (and biased) fraction of safety events that occur and fail to provide information on the true rate of a particular safety event for a given population (Brown, Hofer, Johal, Thomson, Nicholl, Franklin & Lilford, 2008). This type of informal reporting frequently leads to the underestimation and under detection of safety events, hindering the ability to improve care.

Automated surveillance is also becoming a standard method for safety event detection and measurement. An advantage of this approach is that surveillance can occur retrospectively or prospectively (Aspden, Corrigan, Wolcott, Shari& Erickson, 2004), moreover, data are generated without depending on the willingness of caregivers to self-report. Trigger tools are an example of this methodology. An automated trigger is used to identify cases that are "triggered" for further review to

determine whether or not a specific adverse event, such as an adverse drug event (ADE), occurred (Bates, Evans, Murff, Stetson, Pizziferri&Hripcs, 2003). Since this methodology would be too time consuming using the manual review of data, it is best suited for organizations that have large amounts of data that are captured electronically (Brown, Hofer, Johal, Thomson, Nicholl, Franklin & Lilford, 2008), thus limiting its applicability to select organizations.

Administrative or claims data is another common approach for detecting and tracking safety events. Administrative data-based measures take advantage of low-cost, readily available administrative data, making them attractive relative to other measures of safety, such as those obtained from labor intensive chart review. They contain demographic and clinical characteristics of patients, such as length of stay and ICD-9-CM diagnosis and procedure codes, which can be used to detect and track safety events across large populations of patients over time (Romano et al., 2003). One example of an administrative data-based measure is the Patient Safety Indicators (PSIs). Developed by the Agency for Healthcare Quality and Research (AHRQ), the PSIs were designed to capture potentially preventable events that compromise patient safety in acute-care setting, such as complications after surgeries, procedures, or medical care (Romano, Geppert, Davies, Miller, Elixhauser & McDonald, 2003). Despite their "high marks" for feasibility and utility, these tools also have their limitations. Although studies to date suggest that selected PSIs have moderate to good positive predictive validity (Utter, Zrelak, Baron, Tancredi, Sadeghi, Geppert & Romano, 2009; White, Sadeghi, Tancredi, Zrelak, Cuny, Sama et al., 2009), the PSIs are regarded as indicators of potential safety-related events rather than as definitive measures because of their criterion validity. Also, they lack the rich clinical details found in patients' medical charts. Data

elements across health care systems are not consistent, and the accuracy and reliability of ICD-9-CM codes have been consistently questioned (Rosen, Rivard, Zhao, Loveland, Tsilimingras, Christiansen et al., 2005). Improvements in coding will greatly enhance their utility for national safety measurement.

Head Nurses' Management Regarding Patient Safety

Model to Achieve Patient Safety

Healthcare is a team effort. Some of the systemic issues that can impact the number and type of adverse events include: increased complexity of treatment interventions, shortages of qualified healthcare professionals resulting in increased work pressures, continual restructuring of the system, lack of a comprehensive information management technology infrastructure, environmental factors, and funding shortages.

Systemic risks require systemic action. This requires a philosophical change to that of a 'learning culture', where there is an expectation that error will occur every day, that errors need to be anticipated and managed in an atmosphere that promotes and encourages frank discussion and improvement and that offers incentives for healthcare organizations to improve their performance.

Six Sigma model (1990's)

The Six Sigma model is a process improvement methodology that is focused on eliminating damages or disabilities by reducing variable. The Six Sigma model was developed by the Motorola Company in the 1990's and is also widely adopted by other companies deployed as business strategy in organization. The Six Sigma has similar steps to continue quality improvement models. The steps of Six

Sigma including define, measure, analyze, improve and control (DMAIC). The characteristics of the Six Sigma are: a system-wide, data driven approach; a business strategy, concentrating on customer needs; eliminating defect, identification of sources of variation for standardization, maintaining improvement; a problem solving approach; and a powerful set of statistical tools (Lanham & Maxson-Cooper, 2003).

Since 2000, a large number of hospitals used Six Sigma to improve patient safety in order to reduce medical error. The Six Sigma is designed to improve quality performance, increase patient satisfaction and lower costs (Scalise, 2001). A case study at Virtual Health, in improving the safety of anticoagulant use at memorial hospital, show that an increase in the number of patient weighed on admission from 48% to 94%, communication between physician and nurse increase, saving cost from \$166,000 to \$406,000 annually (Scalise, 2003).

According to Lanham and Maxson-Cooper (2003), implementing the Six Sigma in health care has been reducing error and enhancing patient safety. The goal of applying this model in a hospital is to reduce error, and create a blame-free culture. The model, Six Sigma, is very powerful, data driven and is highly effective to reduce error and enhance patient safety in healthcare system.

Healthcare failure mode effect analysis (HFMEA)

A long time ago, the engineering community used the Failure Mode and Effect Analysis (FMEA) model to look for potential failures and address them prior to actual failures (DeRosier, Stalhandske, Bagian, & Nudell, 2002). The FMEA was developed for use by the United States military and is utilized by the National Aeronautics and Space Administration (NASA), to predict and evaluate potential failures and unrecognized hazards and to proactively identify steps in a process that

could help reduce or eliminate a failure from occurring (Reiling, Knutzen, & Stoecklein, 2003). Furthermore, the FMEA was adopted by healthcare industry, because in healthcare industry have similar situation that is error approach to identified the individual as the cause of the adverse event, and find that errors are caused by system or process failures (McNally, Page, & Sunderland, 1997). The Joint Commission on Accreditation of Healthcare Organizations since 2005 requires every hospital to use HFMEA as one means to improve its processes in safety system to conduct proactive risk management activities that identify and predict system weaknesses and adopt changes to minimize patient harm (Reiling, Knutzen & Stoecklein, 2003).

The goal of HFMEA is to prevent errors by trying to identify all the ways a process could fail, estimate the probability and consequences of each failure, and then take action to prevent the potential failures from occurring (Hughes, 2008). Healthcare Failure Mode Effects Analysis is another engineering term that has been adopted by health care. This process analyzes a new process or product to determine potential points of weakness or failure prior to implementation (Hall, Moore, & Barnsteiner, 2008).

The HFMEA was developed by the VA's National Center; the HFMEA tool is used for risk assessment. There are five steps in HFMEA: (1) define the topic; (2) assemble the team; (3) develop a process map for the topic, and consecutively number each step and sub-step of that process; (4) conduct a hazard analysis and (5) develop actions and desired outcomes. In conducting a hazard analysis, it is important to list all possible and potential failure modes for each of the processes, to determine whether the failure modes warrant further action, and to list all causes for each failure mode when the decision is to proceed further. After the

hazard analysis, it is important to consider the actions needed to be taken and outcome measures to assess, including describing what will be eliminated or controlled and who will have responsibility for each action (Hughes, 2008)

The literature indicated many hospitals in the US use HFMEA approach to decrease of near-miss and adverse events, study of (Esmail, 2005) team of Patient Safety and Adverse Events Team in teaching hospitals in Canada purposed to identify the sudden death of both patients occurred involving patients receiving continuous renal replacement therapy (CRRT) in the intensive care unit (ICU). An ICU physician and nurse suspected the cause due to the composition of dialysis high-concentration KCL and KPO₄ being used to treat patients kidney failure. The Patient Safety and Adverse Events Team (PSAT), utilized the Healthcare Failure Mode and Effect Analysis (HFMEA) as a tool to review the process and conditions surrounding the ordering and administration of potassium chloride (KCl) and potassium phosphate (KPO₄) in that ICU. The PSAT found that there were many steps in the ordering and administering the potassium. Before the dialysis manufacturing error occurred, intravenous potassium vials were stored on the regular drug shelves within the pharmacy department. In order to break the chain of errors that have occurred in the past, PSAT changed the preparation, manufacturing, labeling and storage procedures for intravenous potassium products, and finally the risk of error has been substantially reduced.

Root cause analysis

A root cause analysis (RCA) is a formalized investigation and problem solving approach focused in identifying and understanding the underlying causes of an event as well potential event that were intercepted (Hughes, 2008). Root cause analysis was used in engineering and other service sectors to identify the basic and

causal factors that underlie variation in performance, such as the aviation and aerospace industries because they recognized the need to develop strategies to address high-risk activities.

Root Cause Analysis Framework is designed as a quality improvement tool to help individuals and organizations determine all of the contributing factors and the root causes that led to the event. It also provides strategies for developing effective recommendations and implementing actions for system improvement. The RCA framework is only one of the components of patient safety implementation that must also include supportive reporting and disclosure policies, and a quality improvement or risk management infrastructure that enables the applicable processes and activities (Canadian Patient Safety Institute, 2006).

Root cause analysis is now a familiar tool for hospitals and health care organizations which has helped to identify many problems and solutions. The RCA process is designed to answer 3 basic questions: What happened? Why did it happen? And what can be done to prevent it from happening again? (Iedema, Jorm, Long, Braithwaite, Travaglia, & Westbrook, 2006). In addition, RCA is used to systematically investigate an event to find and correct root causes to prevent reoccurrence. RCA uses a retrospective and multidisciplinary approach including, in some instances to identify the sequence of events. The process uses reverse chronology the documenting of events by working back from the incident(Woodward, 2006).

The final step of a RCA is developing recommendations for system and process improvement, based on the findings of the investigation. The importance of this step is supported by a review of the literature on root-cause analysis, that there

is little evidence RCA can improve patient safety by itself(Shojania, Duncan, McDonald, & Wachter, 2001).

PDCA cycle.

PDCA cycle is referred to as Deming circle (Sokovic, Pavletic, & Pipan, 2010). PDCA is four-step improvement process that begins with planning the intervention, implementing the change, measuring results, and using the result to plan further improvements in the system(Hall,Moore&Barnsteiner, 2008).

Application of the PDCA cycle more effective than adopting the right first time approach. Using of the PDCA cycle means continuously looking for better methods of improvement. The PDCA cycle is effective in doing a job and managing a program. The PDCA cycle enables two types of corrective action – temporary and permanent(Sokovic, Pavletic, &Pipan, 2010). PDCA cycle will determine success and effectiveness of the improvement program (Swanson, 1995).The PDCA cycle is more than just a tool; it is a concept of continuous improvement of the processes embedded in the organization’s culture. The most important aspect of PDCA lies in the “act” stage after the completion of a project when the cycle starts again for the further improvement(Sokovic, Pavletic, &Pipan, 2010).

Plan.The purpose of plan phase is to investigate the current situation, fully understand the nature of any problem to be solved, and to develop potential solutions to the problem that will be tested. In patient safety, head nurses should have an annual planning cycle that produces plans that contain: vision, mission, quality policy, operational objectives, budgets, preventive maintenance/actions, document standards, milestones, and new process introductions. Furthermore planning for a system could involve setting up an organization chart, preparing job descriptions or

role statements, a list of authorities concisely indicating who can do what, establishing and regularly reviewing a register of relevant standards / legislation – perhaps subscribing to a notification scheme, considering how those requirements affect your organization, establishing an overall Quality policy such as referring to privacy, confidentiality, customer complaints, various HR policies, communicating those policies to workers and other interested parties e.g. setting targets or KPIs for individuals and planning their development, establishing forms of contract price lists, rates/fee structures, terms and conditions, and establishing plans for how quality will be assured for specific projects.

Do. Dophase is the managers effort to implement the plan, and execute the process. Implementing the system could include ensuring that work is performed by adequately, trained and competent people, supervision where necessary, a system of keeping training records, reminders about training that needs a refresher course, performing work in accordance with plans, contracts, and procedures, ensuring that procedures and other documents are available where needed.

Check. Check phase involves analyzing the effect of the intervention. Compare the new data to the baseline data to determine whether an improvement was achieved, and whether the measures in the aim statement were met. Pareto charts, histograms, run charts, scatter plots, control charts and radar charts are all tools that can assist with this analysis. In the “check” phase, managers reflect on the analysis, consider any additional information that emerged as well and compare the results of test against the measurable objective in plan phase. In addition, the “check” phase also involves documenting the lessons learned, knowledge gained, and any surprising results that emerged.

Act. Act phase marks the culmination of the planning, testing, and analysis regarding whether the desired improvement was achieved as articulated in the aim statement, and the purpose is to act upon what has been learned. Steps in the “act” phase include adopt, adapt and abandon. Adopt refers to standardizing the improvement if the measurable objective in the aim statement has been met. This involves establishing a mechanism for those performing the new process to measure and monitor benchmarks on a regular basis to ensure that improvements are maintained. Run charts or control charts are two examples of tools to monitor performance.

In the adapt phase, the team may decide to repeat the test, gather different data, revise the intervention, or otherwise adjust the test methodology. This might occur, for example, if sufficient data were not gathered, circumstances have changed (e.g., staffing, resources, policy, environment, etc.), or if the test results fell somewhat short of the measurable improvement goal. In this case, “adapt” is the action plan as needed and repeat the “Do” phase.

In the “abandon” phase, if the changes made to the process did not result in an improvement, then consider lessons learned from the initial test, and return to the “Plan” phase. At this point, the team might revisit potential solutions that were not initially selected, or delve back into a root cause analysis to see if additional underlying causes can be uncovered, or even reconsider the aim statement to see if it’s realistic. Whatever the starting point, the team will then need to engage in the Plan cycle to develop a new action plan, and move through the remaining phases.

Finally based on literature reviewed, the PDCA model could be a framework of management in hospital. The PDCA model could be used to identify

the need for an improvement, and PDCA model can be used to sustain improvement in hospital environment particularly in patient safety to achieve good quality.

Furthermore PDCA model is visibility, which became a default method to manage a process.

Nowadays, the PDCA model is baseline for ISO 9001, it is due to the PDCA model portrays process improvement as a continual cycle in which the activities of planning, doing, checking, and acting are all held in equal balance, it is helpful for managing process improvement efforts. The cycle indicates that the task of process improvement is never done, with past results driving future activities. The PDCA philosophy also helps to maintain balanced emphasis in all quadrants of the cycle. Simply put, a team should plan only as much as they can do, do only as much as they can then check, check only as much as can then be acted upon, act only as much as can be planned, and so on as the PDCA cycle continues. Attention is given to each of the four activities so that they support each other, without one dominating the others. It is important to understand that this balance is in terms of the amount of emphasis dictated by the previous steps and necessary to the future steps of the analysis or project. This may not mean equal amounts of time, money, or personnel are involved in each quadrant of the PDCA cycle, or even that any particular quadrant obtains the same amount of these resources on each "pass" through the cycle.

Head Nurses' Management (PDCA Model) for Patient Safety

Plan

Head nurses should put the safety policy into practice through careful planning of the safety activities. Planning means determination of the safety objective, priorities, indicator and preparation of working program to achieve the goals. Each ward can have different objectives and priorities according to the each national patient safety goals. In order to provide safety in practice, head nurses are delegate some duties to representative nurse;a representative is elected from among nurses who has knowledge and experience in patient safety. The nurse representative's main task is follow the protocol or policy, which had considered, otherwise the nurse representative enforcement power is very limited. In the plan phase, head nurses will manage each patient safety goal.

First, head nurses are responsible for ensuring all staff nurses within their sphere of responsibility are aware of policy, protocol and procedure for identify patients correctly. They are responsible for investigating all incidents of patients' misidentification, ensuring action to prevent reoccurrence are implemented (Lucas, 2010). National patient safety agency (NPSA, 2004)commissioned two pieces of work on matching patients with aspects of care. One, carried out by Human Reliability Associates (HRA), reviewed manual checking processes, that is those which did not rely on or make use of electronic aids. The other, carried out by Cambridge Consultants Limited (CCL), looked at the modern and potential uses of technologies, drawing on existing experience in health care. In both cases, the aim was to identify ways in which methods used in the NHS to match patients and their care could be made more reliable. Furthermore, the Joint Commission International (JCI, 2011) mentioned policies or procedures are collaboratively developed to improve identification processes, in particular, 1) patients are identified using two

patient identifiers, not including the use of the patient's room number or location, 2) identify before administering medications, blood, or blood products, 3) identify before taking blood and other specimens for clinical testing, 4) identify before providing treatments and procedures and Policies and 5) procedures support consistent practice in all situations and locations.

Second, effective communication, which is timely, accurate, complete, unambiguous, and understood by the recipient, reduces errors and results in improved patient safety. Communication can be electronic, verbal, or written. The most error-prone communications are patient care orders given verbally and those given over the telephone, when permitted under local laws and regulations. Another error-prone communication is the report back of critical test results (JCI, 2011). In this statement, head nurses are set the protocol for telephone order. Measurable elements are 1) complete verbal and telephone order or test result is written down by the receiver of the order or test result 2) The complete verbal and telephone order or test result is read back by the receiver of the order or test result, 3) The order or test result is confirmed by the individual who gave the order or test result, 4) Policies and procedures support consistent practice in verifying the accuracy of verbal and telephone communications.

Besides that, head nurses also set the communication record form to standardize communication among health caregivers. SBAR (Situation-Background-Assessment-Recommendation) method is adopted to communicate effectively in patient condition report to physician or provide report to the other healthcare providers. It is crucial for nurses to process and value of effective communication to ensure patient safety (Trentam, Andreoli, Boaro, Velji, & Francott, 2010).

Third, ensuring right medications are part of the patient treatment plan, appropriate management of head nurses is critical to ensuring patient safety. High-alert medications are those medications involved in a high percentage of errors and/or sentinel events, medications that carry a higher risk for adverse outcomes, as well as look-alike/sound-alike medications. Lists of high-alert medications are available from organizations such as the World Health Organization or the Institute for Safe Medication Practices. Errors can occur when nurses are not properly oriented to the patient care unit, when nurses are used and not properly oriented, or during emergencies. The most effective means to reduce or to eliminate these occurrences is to develop a process for a managing high-alert medication that includes removing the concentrated electrolytes from the patient care unit to the pharmacy (JCI, 2011).

Measurable elements of right medications are 1) Policies or procedures are developed to address the identification, location, labeling, and storage, of high-alert medications 2) Concentrated electrolytes are not present in patient care units unless clinically necessary, and actions are taken to prevent inadvertent administration in those areas where permitted by policy, 3) Concentrated electrolytes that are stored in patient care units are clearly labeled and stored in a manner that restricts access.

Forth, wrong-site, wrong-procedure, wrong-patient surgery is an alarmingly common occurrence in health care organizations. These errors are the result of ineffective or inadequate communication between members of the surgical team, lack of patient involvement in site marking, and lack of procedures for verifying the operative site. Head nurses need to collaboratively develop a policy and procedure that is effective in eliminating error surgery. The policy includes a definition of surgery that incorporates at least those procedures that investigate and/or

treat diseases and disorders of the human body through cutting, removing, altering, or insertion of diagnostic/therapeutic scopes (JCI, 2011).

Measurable elements of ensure correct site, correct procedure, correct patient surgery are 1) the organization uses an instantly recognizable mark for surgical-site identification and involves the patient in the marking process, 2) the organization uses a checklist or other process to verify preoperatively the correct site, correct procedure, and correct patient and that all documents and equipment needed are on hand, correct, and functional, 3) the full surgical team conducts and documents a time-out procedure just before starting a surgical procedure, and 4) policies and procedures are developed that will support uniform processes to ensure the correct site, correct procedure, and correct patient, including medical and dental procedures done in settings other than the operating theatre (JCI, 2011).

Fifth, head nurses' develops an approach to reduce the risk of health care associated infections. Joint Commission International (JCI, 2011) mentioned central to the elimination infections is proper hand hygiene. Internationally acceptable hand-hygiene guidelines are available from the World Health Organization (WHO), the United States Centers for Disease Control and Prevention (US CDC) and various other national and international organizations. Measurable Elements of reduce the risk of health care-associated infections are 1) implements an effective hand-hygiene program, 2) policies and procedures are developed that support continued reduction of health care-associated infections.

Last, fall is one significant portion of injuries in hospitalized patients. Head nurses should evaluate its patients' risk for falls and take action to reduce the risk of falling and to reduce the risk of injury should a fall occur. The evaluation could include fall history, medications-and-alcohol-consumption review, gait and

balance screening, and walking aids used by the patient. Head nurses are establishes a fall-risk reduction program based on appropriate policies or procedures. The program monitors both the intended and unintended consequences of measures taken to reduce falls such as, the inappropriate use of physical restraints or fluid intake restriction may result in injury. The Measurable Elements of preventing fall are 1) head nurses implements a process for the initial assessment of patients for fall risk and reassessment of patients when indicated by a change in condition or medications, 2) measures are implemented to reduce fall risk for those assessed to be at risk, 3) measures are monitored for results, both successful fall injury reduction and any unintended related consequences, and 4) policies or procedures support continued reduction of risk of patient harm resulting from falls

Do

The second phase in managing patient safety is do phase. In this phase head nurses are implement the plan, and execute the process of each patient safety goals. Implementing the system could include ensuring that work is performed by adequately, trained and competent people, supervision where necessary, a system of keeping training records, reminders about training that needs a refresher course. Head nurses are responsible to explain policy or protocol of six patient safety goals for all staff nurses. In the ward meeting, head nurses should explain clearly the protocol of identify patient correctly, telephone order protocol, list of high-alert medications, five right procedure in medication, recognizable mark for surgical-site identification and involves the patient in the marking process, collective with surgical team conducts and documents a time-out procedure before starting a surgical procedure, hand washing before and after contact with patient, correct use of personal protective

equipment, assessment and monitor for patient fall risk. Besides that, head nurses also provide form related to prevent patient safety error.

Check

The “check” phase, head nurses analyze and compare the results of test against the measurable objective in plan phase. Head nurses activities in check phase are including monitor, audit, comparing data with goal and record data periodically. Head nurses responsible to monitor progress of identify patient correctly using two patient identifiers, progress of effective communication, progress of high alert medication, progress of ensure correct site, correct procedure, correct patient surgery, progress of educe the risk of health care associated infections, and progress of reducing fall. Furthermore, head nurses supervise responsible person in each statement of patient safety goals.

Act

Act phase marks the culmination of the planning, testing, and analysis regarding whether the desired improvement was achieved as articulated in the aim statement, and the purpose is to act upon what has been learned. In act phase, head nurses evaluate program and improve it.

Factors Related to Head Nurses’ Management Regarding Patient Safety

Several factors are related to head nurse management regarding patient safety that is categorized into two groups. The first is demographic data of head

nurses that was considered as relating factor to management regarding patient safety included age, level of education and working experience. The second is environmental factor included type of nursing care in ward.

Age

Erikson (1993) stated that age is associated with development and maturity level, therefore an older person has a better pattern in the way of life than a younger person. The increasing age will increase the maturity level and responsibility of working. Some study showed relationship between age and safety management, but some study not. Mayo and Duncan (2004) mentioned that no studies showed strong relationship between age of nurse and number of medication error. In addition, it indicated that any nurse is potentially at risk in making error.

Level of Education

Learning is the way to gain more knowledge in each branch interest. The higher educational level of person provides more systematical thinking, competency and skill in searching for new knowledge when compared to person with lower educational level. Aiken, Clarke, Cheung, Sloane, and Silber (2003) stated that a positive relationship between nurse's educational levels and reduced mortality or failure to rescue in orthopedic and vascular surgery exists. In contrast Ridley (2008) in review of the study using retrospective design, it was found that there was no significant association between the level of education and the number of patient mortality during hospitalization.

Education is essential to prepare nurses. Nurses' skills are related to training and the level of institutional education received by nurses. These skills are

well reflected in the nurses' handling of patient safety. Education and training should be chosen to enable nurses to develop and apply knowledge and skill to meet demands and their current roles and function needed for managing patient safety (Gould, Berridge, & Kelly, 2007).

Knowledge

Knowledge is the lowest level of cognition to remember factual material and development of intellectual skill. Knowledge includes recall or recognition of fact, procedural pattern and concepts that serve in the development of intellectual abilities and skill. Knowledge is valuable mainly to think in more profound ways (Sousa, 2006).

Knowledge is described as factual, procedural, and conceptual. Factual knowledge is the knowledge of the set of fact. Procedural knowledge is related to the performance of activities or associated with action, such as decision roles and clinical guideline. Conceptual knowledge is the assimilation of new information with prior knowledge and results in a deeper of understanding. Knowledge is commonly used as a major influence in clinical care. Knowledge is acquired through formal and informal study in conjunction with experience in a specific domain of nursing practice (Patel, Kaufman, & Arocha, 2002).

Furthermore, knowledge is commonly cited in two types, tacit and explicit knowledge that are usually referred to in the context of knowledge. Tacit knowledge is the knowledge that cannot verbalize. It is intuitive and based on a value system and determining knowledge in creating a solution to problem. Explicit knowledge can be revealed easily and is usually codified (Botha, 2008).

Previous study in the safety programs of the in healthcare industry argues that successfully achieving a patient safety requires a good learning

environment. Knowledge has been recognized as one of the essential sources of competitive advantage and sustained performance based on the worker's intelligence, as well as an important source of superior performance in turbulent environments. Knowledge sharing is instrumental in the dissemination of knowledge among members of an organization. It is a people-to-people process and a key management process (Ryua, Hob, & Han, 2003). Moreover, sharing knowledge has been tied to various desirable outcomes including learning and problem solving (Leana & Pil, 2006), which are the fundamentals for patient safety. Therefore, nurse knowledge will enhance patient safety.

Training and Education

Training and education are an essential part of skill preparedness for nurses. Nurses' skills are related to training and the level of institutional education received by nurses. These skills are well reflected in the nurses' handling of patient safety. Education and training should be chosen to enable nurses to develop and apply knowledge and skill to meet demands and their current roles and function needed for managing patient safety (Gould, Berridge & Kelly, 2007).

Competency assessment may determine the efficacy of training intervention in imparting the knowledge and skill. Training may influence the nurses' skill level. Low scores on competency assessment after training may indicate that training was ineffective, poorly designed, poorly presented, or inappropriate. Jensen et al., (2009) argue that the training program will increase knowledge and skill, when its contents, method and strategies fit for characteristics of

participants. Tippins (2005) found nurses had more skills and ability to identify initial assessment at critical illness when they receive training.

Years of Working Experience

Experience should be defined in terms of how well it can transform or change nurses' knowledge and skill. Experience can be gained through sudden insights, acquired new views on the benefit of former learning, absorbed from other examples and picked up from one's own mistakes and repeated action in similar situation by being attuned (Jensen, Lippert, Hesselfeldt, Rasmussen, Mogensen, Jensen et al., 2009).

The term experience is used widely in nursing and often hard to define. Watson identifies the following three criteria for experience: 1) provisional criteria or the passage of time, 2) gaining skills or knowledge, and 3) exposure to an event (Watson, 1991). Passing of time is commonly used to define experience in nursing, particularly in nursing research, where years of experience are used to categorize nurses. Gaining skills or knowledge as criteria for experience supports the notion that there is a complex relationship between knowledge and experience and that knowledge is gained through experience. Experience in terms of exposure to events is also an important source of knowledge in nursing, and the value of familiarity and previous experience in clinical decision-making is well documented. Past experience is also reported to be an important factor in making time critical decisions (Patel, Kaufman&Arocha, 2002).

Personal experience constitutes as an important component of nursing consideration in working with individual. Statistical projections of outcome regarding medication effectiveness, symptom relief and extension of lives are valuable but do not provide a complete picture of the anticipated individual situation in regard to personal functioning, side effect, or impact on family and other personal relationship (Rodgers, 2004). Furthermore, the strong clinical background of nurses naturally prepares them to both leadership and staff position within quality management and performance improvement in patient safety (Gantz, Sorenson, & Howard, 2003).

Type of Nursing Delivery

Type of nursing delivery is a way of organizing at the unit level to facilitate the delivery of nursing care to the patients. There are four common nursing care models: functional nursing, team nursing, primary nursing, and case management nursing. Various types of care delivery models are designed to meet the goals of efficient and effective nursing care. The most common nursing care delivery models include functional nursing, team nursing, primary nursing, and case management nursing (Lyon, 1993).

Houser (2003) conducted research on a model for evaluating the context of nursing care delivery. Results of the study showed that as nursing staff becomes more competent the incidence of adverse events decline. The data suggest that a linkage between teamwork and a strategy for achieving quality patient outcomes results in a lower incidence of patient adverse events. Specific quality patient outcomes as a result of teamwork can influence coworker support, and respecting the autonomy of professional nurses. A focus on developing strong leaders

can reduce the staff instability and cycle of turnover that often accompany increased demand.

Context of Public Hospital in Indonesia

The health care industry has been going through some radical changes in recent years. Like most other service industries, the current hospital industry is very capital intensive, technology intensive, and labor intensive. The hospital is part of the District Health System (DHS), and continues to play an essential role in order to achieve optimum health for the population. In Indonesia, the hospital service utilization pattern for the last 10 years confirms the role of the hospital as an important source of care. The performance of hospitals, though, has been challenged by globalization, decentralization of government services and specifically by recent health care system and organizational reforms. The global patient safety initiative is integral to many of these reforms.

Hospitals in Indonesia have different characteristics in terms of ownership, function, service specifications and capacity to provide range of clinical services as the following: 1) ownership, into private and public hospitals, 2) structure, into general and specialized hospitals, 3) financial objectives, into for-profit and non-profit hospitals, 4) function related to educational responsibilities, into teaching and non-teaching hospitals, 5) degree of service specification, into general and specialized hospitals, and 6) capacity to provide range of clinical services, into

level of referral hospitals (secondary and tertiary care) and different hospital class for public hospital (A, B, C and D) (Ministry of Health of Indonesia, 2007).

The classification of public hospital is established by services, human resources, equipment, facilities and infrastructure; and administration and management. Hospitals with A level rating allocate a minimum of 400 beds, have a broad range of facilities providing specialized and sub-specialized clinical services. Hospitals with B level rating allocate a minimum of 200 beds provide at least eleven (11) specialized clinical service and limited sub-specialized care facilities in the range of clinical services offered, teaching and non-teaching hospital. Hospitals with C level rating allocate a minimum of 100 beds and provide at least four (4) basic specialized clinical services and facilities in the range of clinical services offered. Finally, hospitals with D level rating allocate a minimum of 50 beds, offer basic medical services and facilities in the range of clinical services (Ministry of Health of indonesia, 2007).

Implementation patient safety standard in Indonesia is integrated in the national hospital accreditation. The in the 2006 standards consist of seven areas, as follows 1) create awareness of patient safety, 2) lead and support the staff, 3) Introduce risk management activities, 4) develop a reporting system, 5) involve and communicate with the patients, 6) learn and share experiences on patient safety and 7) prevent adverse events through the implementation of patient safety (Ministry of Health of Indonesia, 2011).

Progress on patient safety improvement programs are properly monitored, evaluated, and improved. Since 2011 the Indonesian Ministry of Public Health has adopted the Patient Safety Goals policy from the Joint Commission International (2011) and has recently implemented this policy to all healthcare

settings throughout the country. The patient safety goals statements are elaborated in the policy statement of the Health Minister in Chapter IV, Verse 1 and 2. These statements include: (a) identifying patients correctly, (b) improving effective communication, (c) maintaining safety of high-alert medications, (d) ensuring correct-site, correct-procedure, and correct-patient surgery, (e) reducing the risk of health care associated infections, (f) and reducing the risk of patient harm resulting from falls.

Summary

Patient safety is a discipline in the health care sector that applies to safety science methods toward the goal of achieving a trustworthy health care delivery system. Patient safety is also an attribute of health care systems that minimizes incidents and their impact and maximizes recovery from adverse events.

Since the implementation of the healthcare accreditation, the interest in patient safety has increased. International Council of Nurses (ICN) emphasized the responsibilities of the nurses on patient safety. Nurse managers or head nurses have an important role in reducing the adverse events since nurses have higher safety awareness compared to that of other disciplines. It is important to investigate the perception of hospital organization culture regarding patient safety, the reporting of medical errors, to identify factors associated with the perception of patient safety and the nurse's safety management and to investigate the incidence and the nurse's perception on reporting medical errors, to identify the factors associated with the nurse's perception on patient safety.

Head nurse as a nurse manager who has responsibility to managing patient safety in each ward. Safety management as a determinant of quality

improvement connotes any processes or tools that aim to increase safety systematically and in organizational functions according to the dimensions of quality. To achieve and improve quality, different quality improvement models or methodologies exist in health care. The most common quality improvement methodology applying in hospital is PDCA (plan-Do-Check-Act) cycle or Deming model. PDCA model is baseline for ISO 9001, it is due to the PDCA model portrays process improvement as a continual cycle in which the activities of planning, doing, checking, and acting are all held in equal balance, it is helpful for managing process improvement efforts.

Patient safety goals in Indonesia, as a condition to be applied in all hospitals are accredited by the Commission on Accreditation of Hospitals. Preparation of this target refers to the Nine Life-Saving Patient Safety Solutions of the WHO Patient Safety (2007) which were used by the Hospital Patient Safety Committee and from the Joint Commission International (JCI). The patient safety goals statements are elaborated in the policy statement of the Health Minister in Chapter IV. In order to determine whether hospital administrators, specifically head nurses conform to this policy and its statements, this study will assess whether head nurses have perceived the patient safety goals statements appropriately. These statements include: (a) identifying patients correctly, (b) improving effective communication, (c) maintaining safety of high-alert medications, (d) ensuring correct procedure (e) reducing the risk of health care associated infections, (f) and reducing the risk from falls.

In order to fulfill the gap, this study aim to discover the current head nurses' perception and management regarding patient safety in Aceh Province

Indonesia. The management and perception derived from the literature review provides a basis to develop conceptual framework underpinning in this study. The tentative guideline in this study will be developed based on the existing guideline propose by Health Minister of Indonesia in Chapter IV that was adopted from Joint Commission International (JCI).

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the research methodology used in this study. The details of the research design and its methodology involve the population and setting, sample and sampling technique, instrumentation, validity and reliability of the instruments, the data collection procedure, ethical consideration and the data analysis; these are presented as follows.

Research Design

In this study, a descriptive correlational study was conducted to examine the head nurses' management and its related factors regarding patient safety in public hospitals of Aceh province, Indonesia from January to March 2013.

Population and Setting

Population

The subjects of this study were head nurses who work in public hospitals, Aceh province, Indonesia. According to the Department of Health of Aceh (Dinas Kesehatan Aceh, 2012) there are 179 head nurses working in 21 public hospitals in Aceh province.

Setting

The numbers of head nurses in public hospitals in Aceh province are 179 head nurses, their wards include: the medical ward, surgical ward, pediatric ward, ICU, ICCU, and maternity ward. All of them apply management in their daily nursing activities. Even though the locations of hospitals were in different places the structure and function were quite similar. Therefore, the researcher expected that head nurses in Aceh province would be good representatives of head nurses of other hospitals in Indonesia.

Table 1

Number of Hospitals and Head Nurses for Each District And Municipality

No	Hospital	Head nurses
1.	Sabang Hospital, Sabang	7
2.	Ibu dan AnakHospital, Banda Aceh	8
3.	Meuraxa Hospital, Banda Aceh	15
4.	Sigli Hospital, Aceh Sigli	11
5.	Dr. Fauziah Hospital,Bireuen	9
6.	DatuBeru Hospital, Takengon	9
7.	Cut Mutia Hospital,Lhokseumawe	12
8.	PTP IX Hospital, Cot Girek, Aceh Utara	8
9.	Idi Rayeuk Hospital, Idi Rayeuk	10
10.	Langsa Hospital, Langsa	8
11.	Aceh Tamiang Hospital, Aceh Tamiang	10
12.	Aceh Singkil Hospital, Aceh Tamiang	5

Table 1 (Continued)

No	Hospital	Head nurses
13.	Dr. H.Yulidin Away, Aceh Barat	6
14.	Aceh Jaya Hospital, Aceh Jaya	9
15.	Cut NyakDhien Hospital, Aceh Barat	10
16.	TeungkuPeukan Hospital, Aceh Barat Daya	8
17.	Nagan Raya Hospital, Nagan Raya	6
18.	Yulidin Awai Hospital, Tapak Tuan	8
19.	BlangKeujeren Hospital, GayoLuwes	5
20.	Sahuddin Hospital, Kutacane	10
21.	Simeulu Hospital, Sinabang	5
Total		179

Sample and Sampling

Characteristics

In this study, subjects were recruited if they met the following criteria:

(a) has been working as a head nurse at least 1 year in the target hospitals and (b) has completed a minimum diploma degree in nursing.

Sample Size

Based on the data from the Department of Health of Aceh, there were 179 head nurses, thus this number was used to estimate the sample size. The sample size was estimated by using Yamane's formula (Yamane as cited in Wilson, 2010).

$$n = \frac{N}{(1 + Ne^2)}$$

$$n = \frac{179}{(1 + 179(0.05)^2)}$$

$$n = 123 \text{ persons}$$

N = The number of head nurses in the study

n = Sample

Sampling Technique

There are 19 districts in Aceh province and 21 public hospitals. In order to ensure the representativeness of the study sample, a proportionate stratified random sampling technique was used to recruit 123 head nurses from 14 out of 21 hospitals of three geographical areas of Aceh province. The geographical areas were used as stratum (one is an urban area; the other two are sub-rural/rural areas). The hospitals located in each area were then randomly drawn. Finally all head nurses in the selected hospitals who met the inclusion criteria were approached.



Picture 1

Map of Aceh Province, Indonesia (Acehprov, 2013).

Instrumentation

Instruments

The instruments for collecting data in this study were developed by the researcher. They consisted of two parts: (1) The demographic data questionnaire, (2) head nurses' management regarding patient safety questionnaire.

Part 1: The demographic data questionnaire (DDQ)

The Demographic Data Questionnaire was constructed by the researcher. The demographic data questionnaire was a brief question about patients' safety in their ward and sorting it out into four parts. In the first part, questions numbers 1 to 7 were the participants' demographic data including: age, gender, religion, level of education, years of experience in current area, type of nursing delivery,

and arrangement in the medication room. In the second part, questions numbers 8 to 13 were asked for the incident in patient safety. The third part: question numbers 14 to 24 were asked for management regarding patient safety, and the last part, question numbers 25 to 29 were asked for the perception about patient safety (Appendix B). Ages was rated on the following two categories based on mean score, range ≤ 37.51 years old and > 37.51 years old. Level of education was rated on diploma and bachelor. Years of working experience as head nurses was rated on ≤ 5 years and > 5 years. Questions numbers 7 to 18 were given the scores 1 = yes and 0 = no. Questions numbers 19 to 24 were given 1 = Less likely, 2 = Some likely and 3 = Most likely. Questions numbers 25 to 29 were given score 1 = Low, 2 = moderate, and 3 = high.

Part 2: Headnurses' management regarding patient safety questionnaire (HNM-PSQ)

This questionnaire was developed based on the proposed framework to assess the level of management regarding patient safety goals statements and displaying use of the PDCA cycle. The patient safety goals included: (a) identifying patients correctly, (b) improving effective communication, (c) maintaining safety of high alert medications, (d) ensuring correct procedure (e) reducing the risk of health care associated infections, (f) and reducing the risk from fall. In order to manage patient safety to achieve patient safety goals, the PDCA method was used to measure head nurses' management in their wards. The PDCA method stands for Plan, Do, Check and Act. In addition, the PDCA method was used to measure each item of patient safety goals statements. This questionnaire consists of 83 items (Appendix G). Each statement was rated on a five-point Likert scale, the scores are as follows:

- 5 = Head nurse performed patient safety management exactly as the item stated
- 4 = Head nurse performed patient safety management much likely as the item stated
- 3 = Head nurse performed patient safety management moderate as the item stated
- 2 = Head nurse performed patient safety management less as the item stated
- 1 = Head nurse did not performed patient safety management like as the item stated

The total scores and the dimension scores were calculated and presented as the average scores. The higher scores indicate the high level of head nurses' management regarding patient safety. They were then averaged for comparable interpretation and categorized into three levels as follows:

Head nurses' management regarding patient safety. The levels of head nurses' management regarding patient safety were identified based on total mean score, high = 304.34 - 415.00, moderate = 193.68 - 304.33 and low = 83.00 – 193.67. The higher score of every scale indicated a higher frequency of head nurses' management regarding patient safety in their ward.

Identifying patient correctly. The levels of head nurses' management regarding patient safety in identifying patient correctly were identified based on total mean score, high = 44.01 – 60.00, moderate = 28.01 – 44.00 and low = 12.00 – 28.00. Furthermore the level in each question were indentified, high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Improving effective communication. The levels of head nurses' management regarding patient safety in effective communication were identified based on total mean score, high = 44.01 – 60.00, moderate = 28.01 – 44.00 and low = 12.00 – 28.00. Furthermore the level in each question were indentified, high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Maintaining safety of high alert medication. The levels of head nurses' management regarding patient safety in maintaining high alert medication were identified based on total mean score, high = 51.34 – 70.00, moderate = 32.68 – 51.33 and low = 14.00 - 32.67. Furthermore, the level in each question was identified as high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Ensuring correct procedure. The levels of head nurses' management regarding patient safety in correct procedure were identified based on total mean score, high = 44.01 – 60.00, moderate = 28.01 – 44.00 and low = 12.00 – 28.00. Furthermore the level in each question was identified as high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Reducing the risk of healthcare associated infection. The levels of head nurses' management regarding patient safety in reducing healthcare associated infection were identified based on total mean score, high = 69.68 – 95.00, moderate = 44.34 – 69.67 and low = 19.00 – 44.33. Furthermore, the level in each question was identified as high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Reducing the risk from fall. The levels of head nurses' management regarding patient safety in reducing risk of fall were identified based on total mean score, high = 51.34 – 70.00, moderate = 32.68 – 51.33 and low = 14.00 - 32.67. Furthermore the level in each question was identified as high = 3.67 – 5.00, moderate = 2.34 – 3.66 and low = 1.00 – 2.33.

Validity and Reliability of the Instruments

The validity of the instruments

The head nurses' management regarding patient safety questionnaire was a new questionnaire developed by the researcher. The content

validity of the head nurses management regarding patient safety questionnaire was validated by a panel of three experts in the field of nursing administration for determining the appropriateness, relevancy, and accuracy of the instrument. Two Thai experts in nursing administration and one from Indonesia served on the panel. Unfortunately, the Indonesian expert misunderstood the instrument and was replaced by an expert from Thailand. Based on the experts' opinions and recommendations some areas of the questionnaire were modified. Internal consistency reliability was tested, yielding the satisfactory coefficient of .92 for the entire scale and .87 to .95 for the dimension scales.

The reliability of instruments

The reliability test of the instrument was performed to test the Indonesian version with 20 subjects who had similar criteria to the real subjects by using the Cronbach's alpha coefficient for each subscale of the instruments. The result of Cronbach's alpha was .92 for head nurses' management regarding patient safety.

Data Collection Procedures

The data collection procedures were divided into two phases; preparation phase and implementation phase.

Preparation phase

1. The researcher obtained permission for data collection from the International Ethics Committee of the Faculty of Nursing, Prince of Songkla University, Thailand.
2. Obtained a letter from the Dean of the Faculty of Nursing, Prince of Songkla University, Thailand.
3. Acquired an administrative permission from the director of the each public hospital.

Implementation phase

The process below shows the steps in data collection:

1. Data was collected after getting the approval from the committee of Faculty of Nursing, Prince of Songkla University. The researcher asked permission from the directors of the public hospitals in Aceh Province Indonesia to conduct the study.
2. The researchers contacted the participants, made introduction and gave explanation regarding the study. After receiving the explanation, the participants were asked to sign an informed consent form.
3. Distributed the questionnaire to the head nurses.
4. Requested the subjects to send back the filled questionnaire directly to the researcher within one week of distribution.
5. The researcher collected the filled questionnaires.
6. The researcher coded the questionnaires to ensure anonymity of the participants.

7. Finally, the confidentiality of the subject was maintained and after entering the data in computer program for analysis the questionnaires were destroyed.

Ethical Consideration

Data collection started after the Institutional Review Board of Faculty of Nursing, Prince of Songkla University, Thailand approved the research proposal. Permission from the director of public hospitals were also granted. The researcher explained the purpose of the study, objectives, outcomes and publication of the study. The subject who agreed to participate in this study were explained how to complete the entire questionnaire and informed about their right to withdraw at any time from this study for any reason without any fear or negative consequences for them. Code was used to maintain confidentiality and all the information was reserved by the researcher only for the purpose of research.

Data Analysis

Computer software was used to enter, screen, clean and manage the collected data. According to the objective of the study and the level of the measurement of the variables, the details of each instrument are as follows:

1. Demographic data were analyzed by using frequencies, percentages, means and minimum and maximum score.

2. The data concerning head nurse management were analyzed in terms of means, percentage and standard deviation for each item and then overall. The researcher tested the normality assumption of head nurses' management by using skewness and kurtosis ratio, and the assumption was met.

3. Related factors were analyzed utilizing descriptive statistics: frequency and percentage.

4. An independent t-test was used to compare mean differences of head nurses' management regarding patient safety and related factors including age, level of education and year of experience as a head nurse

5. A one-way analysis of variance (ANOVA) was used to compare the mean differences of head nurses' management regarding patient safety with the type of nursing delivery.

CHAPTER 4

RESULTS AND DISCUSSION

This chapter presents the results from the study and discussion of the results. This research was designed to examine: 1) Head nurses' management regarding patient safety, 2) Related factors of patient safety in public hospitals of Aceh Province, Indonesia. One hundred and twenty three subjects were recruited from 14 public hospitals located in Aceh province, Indonesia. The results of this study are presented in three parts. The first part consists of demographic data, the second part involves the level of head nurses' management and the third part is factors related to head nurses' management.

Results

Part I Demographic Data

Table 2 The subjects consisted of 123 head nurses. The age of subjects ranged from 25 years to 55 years with an average age of 37.51 years ($SD=6.02$) and most of them (74.8%) were female. All of the subjects were Muslim (100%) and more than half (51.2%) had a bachelor degree in nursing. Most of the subjects (61.8%) had worked as a head nurse for five years or less and almost half of them (43.1%) applied the team method as the type of nursing delivery in their unit and majority of the subjects (71.5%) arranged a medication room.

Table 2

Frequency and Percentage of Subjects' Demographic Characteristics (N = 123)

Characteristics	n	%
Age (years)		
≤ 37.51	63	51.2
> 37.51	60	48.8
<i>(M= 37.51, SD = 6.02, min-max = 25-55)</i>		
Gender		
Male	31	25.2
Female	92	74.8
Religion		
Islam	123	100
Level of education		
Diploma	60	48.8
Bachelor	63	51.2
Years of experience as head nurses		
≤ 5 years	76	61.8
> 5 years	47	38.2
<i>(Median = 3.75, IQR = 4.92)</i>		
Type of nursing delivery		
Functional	36	29.3
Team	53	43.1
Mixed functional and team method	34	27.6
Arrange the medication room within the ward		
Yes	88	71.5
No	35	28.5

Table 3 shows the frequency and percentage of subjects' answers regarding various incidents in patient safety. All head nurses (100%) reported no incident in identification of patients. Majority of them reported no incident in communication (98.4%), high alert medication (98.4%), correct procedures (95.9%), healthcare associated infections (76.4%) and patient falls (96.7%). But, a few subjects reported incidents in correct procedure (4.1%), healthcare associated infections (23.6%) and patient falls (3.3%).

Table 3

Frequency and Percentage of Subjects' Answers Regarding Various Incidents in Patient Safety (N = 123)

Incident	No		Yes	
	n	%	N	%
Patient identification	123	100	0	0
Effective communication	121	98.4	2	1.6
High alert medication	121	98.4	2	1.6
Correct procedure	118	95.9	5	4.1
Healthcare associated infection	94	76.4	29	23.6
Patient fall	119	96.7	4	3.3

Table 4 shows the frequency and percentage of general activity toward the management. More than half of the subjects reported having good management in their ward (54.5%). Majority of them set a plan for safety management (93.5%) and set the PDCA model (87.8%) as a guide for patient safety management. More than half of them were dissatisfied with their safety management (51.2%), set the key

performance indicator (KPI) (52.0%), most likely to set a policy for patient safety (58.5%). The majority supervised nurses' about patient safety management (76.4%), and nearly half of subject modified some patient safety policy (49.6%). Majority of subjects tested were more likely to implement the safety management (65.0%), evaluating safety management (62.6%) and adjusting the safety management (63.4%).

Table 4

Frequency and Percentage of General Activity Toward the Management (N = 123)

Item	n	%
Have good management in ward		
Yes	67	54.5
No	56	45.5
Set plan for safety management		
Yes	115	93.5
No	8	6.5
Set PDCA for patient safety		
Yes	108	87.8
No	15	12.2
Satisfied with safety management		
Yes	60	48.8
No	63	51.2
Set Key Performance Indicator for safety management		
Yes	64	52.0
No	59	48.0

Table 4 (Continued)

Item	n	%
Set the policy for patient safety		
Less likely set	7	5.7
Some	44	35.8
Most likely set	72	58.5
Supervised nurses about patient safety management		
Less likely supervise	3	2.4
Some	26	21.1
Most likely supervise	94	76.4
Modified patient safety policy appropriate to the ward		
Less likely modify	19	15.4
Some	61	49.6
Most likely modify	43	35.0
Implement the safety management		
Less likely implement	5	4.1
Some	38	30.9
Most likely implement	80	65.0
Evaluate for the safety management		
Less likely evaluate	5	4.1
Some	41	33.3
Most likely evaluate	77	62.6
Adjust the safety management		
Less likely adjust	2	1.6
Some	43	35.0
Most likely adjust	78	63.4

Part II Head Nurses' Management Regarding Patient Safety

Table 5 shows mean, standard deviation and level of head nurses' management regarding patient safety using the PDCA model. The result showed that the level of overall management was high ($M = 333.85$, $SD = 49.61$).

Table 5

Mean, Standard Deviation, and Level of Head Nurses' Management Regarding Patient Safety (N = 123)

Items	Possible range	M	SD	Level
Head nurses' management	83 – 415	333.85	49.61	High
Plan	23 – 115	93.22	13.86	High
Do	24 – 120	98.26	13.33	High
Check	18 – 90	72.42	11.43	High
Act	18 – 90	69.94	12.52	High

Table 6 shows the mean, standard deviation and the level of head nurses' management regarding patient safety, categorized by each step of PDCA cycle. The results showed that management in each dimension, including identifying patients correctly ($M = 52.78$, $SD = 6.21$), improving effective communication ($M = 49.04$, $SD = 7.08$), maintaining safety of high alert medication ($M = 58.74$, $SD = 8.95$), ensuring correct procedures ($M = 48.66$, $SD = 7.93$), reducing the risk of healthcare associated infections ($M = 72.00$, $SD = 13.95$) and reducing the risk from falls ($M = 52.60$, $SD = 12.18$) was at a high level.

Table 6

Mean, Standard Deviation, and Level of Overall Score of Head Nurses' Management Regarding Patient Safety, Categorized by Each Step of PDCA Cycle (N = 123)

Dimension	Possible range	M	SD	Level
Identifying patient correctly	12 – 60	52.78	6.21	High
Plan	3 – 15	12.95	2.06	High
Do	3 – 15	13.65	1.54	High
Check	3 – 15	13.73	1.76	High
Act	3 – 15	12.45	2.24	High
Improving effective communication	12 – 60	49.04	7.08	High
Plan	2 – 10	8.18	1.66	High
Do	3 – 15	12.82	2.07	High
Check	2 – 10	8.22	1.52	High
Act	5 – 25	19.79	3.12	High
Maintaining safety of high alert medications	14 – 70	58.74	8.95	High
Plan	4 – 20	17.59	2.77	High
Do	4 – 20	17.45	2.50	High
Check	3 – 15	11.45	2.64	High
Act	3 – 15	12.24	2.61	High

Table 6 (Continued)

Dimension	Possible range	M	SD	Level
Ensuring correct procedure	12 – 60	48.66	7.93	High
Plan	4 – 20	16.78	2.23	High
Do	3 – 15	12.15	2.65	High
Check	3 – 15	12.17	2.34	High
Act	3 – 15	7.54	1.91	High
Reducing the healthcare associated infections	19 – 95	72.00	13.95	High
Plan	7 – 35	28.04	5.09	High
Do	6 – 30	22.78	4.14	High
Check	3 – 15	10.73	3.08	Moderate
Act	3 – 15	10.43	3.30	Moderate
Reducing risk from fall	14 – 70	52.60	12.18	High
Plan	3 – 15	9.65	3.74	Moderate
Do	5 – 25	19.38	4.15	High
Check	4 – 20	16.08	3.30	High
Act	2 – 10	7.47	2.37	High

Head nurses' management regarding identifying patients correctly

Table 7 shows the mean, standard deviation and level of head nurses' management regarding identifying patient correctly using the PDCA model. In the plan phase, the high means score was at inform the policy regarding patient

identification that all nurses should follow strictly ($M = 4.40$, $SD = 0.69$). In the do phase, the high mean score was at emphasize patient identification policy for all nurses have primary responsibility for check and verifying a patient's identity before intervention given ($M = 4.62$, $SD = 0.59$). In the check phase, the high mean score was at patient needs prioritized based on the patient's condition at the time of admission ($M = 4.67$, $SD = 0.68$). In the act phase, the high mean score was at investigating all of patient misidentification, ensuring actions to prevent reoccurrence are implemented ($M = 4.34$, $SD = 0.75$).

Table 7

Mean, Standard Deviation and Level of Head Nurses' Management Regarding Identifying Patient Correctly (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
2	Inform the policy regarding patient identification that all nurses should follow strictly	4.40	0.69	High
1	Inform the goal of ensuring identify patient correctly based on hospital standard.	4.34	0.76	High
3	Set the double check guideline to identify patients correctly in order to prevent error in patient who has similar name	4.21	0.89	High
<i>Do</i>				
2	Emphasize patient identification policy for all nurses have primary responsibility for check and verifying a patient's identity before intervention given	4.62	0.59	High
1	Explain to all nurses to identify the patient correctly by asking the patient by name	4.59	0.55	High
3	Explain to all nurses to cross check to confirm patient identification details and demographic details with the patient's health records	4.45	0.78	High

Table 7 (Continued)

No	Item	M	SD	Level
<i>Check</i>				
3	Patient needs are prioritized based on the patient's condition at the time of admission	4.67	0.68	High
2	Check available laboratory results in a timely way as defined by the hospital standard	4.54	0.63	High
1	Check the patient's medical record and nursing needs based on identifiers from the initial assessments	4.52	0.72	High
<i>Act</i>				
1	Investigate all of patient misidentification, ensuring actions to prevent reoccurrence are implemented	4.34	0.75	High
2	Modify the guideline for identifying patient correctly	4.07	0.89	High
3	Re-set the supervision technique for identifying patient correctly	4.05	0.88	High

Head nurses' management regarding improving effective communication

Table 8 shows the mean, standard deviation and level of head nurses' management regarding improving effective communication using the PDCA model. The results showed that head nurses' management in the plan phase was at a high level and the high mean item was inform the hand over guideline (situation, background, assessment and recommendation) for communication among nurses ($M = 4.2$, $SD = 0.83$). Head nurses' management in the do phase was at a high level and they had encouraged all nurses to record the situation, background, assessment and recommendations in the patient file ($M = 4.45$, $SD = 0.66$). Head nurses' management in the check phase was at a high level and they checked the hand-over form in the patient file ($M = 4.22$, $SD = 0.74$). Head nurses' management in the act phase was at a

high level and they had called a meeting when the unit had a communication problem (M = 4.29, SD = 0.71).

Table 8

Mean, Standard Deviation and Level of Head Nurses' Management Regarding Improving Effective Communication (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
2	Inform the hand-over guideline (situation, background, assessment and recommendation) for communication among nurses.	4.23	0.83	High
1	Set the protocol to achieve effective communication both of verbal communication and telephone orders	3.96	1.01	High
<i>Do</i>				
1	Encourage all nurses to record the situation, background, assessment and recommendation in patient file	4.45	0.66	High
2	Provide hand-over form (situation, background, assessment and recommendation) as a communication record during hand over among nurses	4.27	0.85	High
3	Encourage all nurses to use the hand-over guideline during changing shift	4.11	1.01	High
<i>Check</i>				
1	Check the use of hand-over form in patient file	4.22	0.74	High
2	Compare incident report with expected goals	4.01	0.91	High
<i>Act</i>				
5	Call a meeting when the unit has problem about communication	4.29	0.71	High
4	Supervise the effective communication continuously	3.99	0.98	High
2	Evaluate the incident of effective communication	3.92	0.77	High
3	Evaluate nurses in utilization of all forms	3.89	0.94	High
1	Evaluate and modify the hand-over form that is available to use every time	3.70	0.80	High

Head nurses' management regarding maintaining safety of high alert medications

Table 9 shows the mean, standard deviation and level of head nurses' management regarding maintaining safety of high alert medications using the PDCA model. The results showed that head nurses' management in the plan phase was at a high level and they had informed the guidelines to achieve safety regarding high alert medication by using the five right methods ($M = 4.48$, $SD = 0.75$). Head nurses' management in the do phase was at a high level and they had emphasized all nurses to use the five right methods (5R) before medicine was given to a patient ($M = 4.64$, $SD = 0.54$). Head nurses' management in the check phase was at a high level and they had monitored the staff nurses compliance to high alert medication regarding conducting evaluations during meetings ($M = 3.95$, $SD = 0.81$). Head nurses' management in the act phase was at high level and they had supervised the safety of high alert medication continuously ($M = 4.13$, $SD = 0.93$).

Table 9

Mean, Standard Deviation and Level of Head Nurses' Management Regarding Maintaining Safety of High Alert Medication (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
2	Inform the guideline to achieve safety high alert medication by using five right methods	4.48	0.75	High
1	Inform the goal of safety high alert medication based on hospital standard	4.44	0.70	High
4	Prioritize the process in giving high alert medication	4.37	0.85	High

3	Set the guidelines to achieve safety high alert medication by double check with the medical administration record	4.31	0.87	High
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Table 9 (Continued)

No	Item	M	SD	Level
<i>Do</i>				
1	Emphases for all nurses to use five right methods (5R) before medicine are given to patient	4.64	0.54	High
2	Encourage all nurses to do double check with the medical administration record	4.52	0.60	High
4	Monitor high alert medication side effect	4.19	0.97	High
3	Arrange the medicine which look-alike or sound-alike obviously	4.11	0.93	High
<i>Check</i>				
1	Monitor the staff nurses compliance to the high alert medication by conducting evaluation in meetings	3.95	0.81	High
3	Check the system of providing high alert medication	3.84	1.09	High
2	Audit the incident report particularly in high alert medication administration	3.67	1.08	High
<i>Act</i>				
2	Supervise the safety high alert medication continuously	4.13	0.93	High
1	Evaluate the medication sheet including the 'five right' method	4.11	0.90	High
3	Consult with a doctor/pharmacist about high alert medication	4.00	0.99	High

Head nurses' management regarding ensuring correct procedure

Table 10 shows the mean, standard deviation and level of head nurses' management regarding ensuring correct procedure using the PDCA model. The results showed that head nurses' management in the plan phase was at a high level and they had obtained informed consent for any intervention (M = 4.58, SD = 0.60). Head nurses' management in the do phase was at a high level and they had explained to all

nurses how to obtain informed consent, which has to filled out by the patient/family members/significant person, regarding intervention (M = 4.25, SD = 0.87). Head nurses' management in the check phase was at a high level and they had supervised the incident report of any intervention (M = 4.09, SD = 0.83). Head nurses' management in the act phase was at a high level and they had facilitated the availability of patient informed consent forms (M = 3.91, SD = 1.00).

Table 10

Mean, Standard Deviation and Level of Head Nurses' Management

Regarding Ensuring Correct Procedures (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
4	Provide patient inform consent for any intervention	4.58	0.60	High
1	Plan use of materials to ensure correct procedure	4.13	0.90	High
2	Set the indicators for patient safety in ensure correct site, correct procedure, and correct patient surgery	4.11	0.82	High
3	Set the unit policy for attaching the procedure safety checklist form in patient folder	3.97	0.87	High
<i>Do</i>				
3	Explain to all nurses how to apply patient informed consent that has to fill out by patient/family members/significant who will get any intervention	4.25	0.87	High
2	Supply patient informed consent for any intervention	4.21	1.01	High
1	Supply the procedure safety checklist promptly to nurse	3.69	1.11	High
<i>Check</i>				
2	Supervise the incident report of any intervention	4.09	0.83	High
1	Audit the progress of staff nurses' compliance to safety procedure	4.08	0.81	High
3	Recording incident data in monthly record	4.01	0.93	High

<i>Act</i>				
2	Evaluate the availability of form of patient inform consent	3.91	1.00	High
1	Evaluate the availability of form for safety procedure	3.63	1.03	Moderate

Head nurses' management in reducing the risk of healthcare associated infection

Table 11 shows the mean, standard deviation and level of head nurses' management using the PDCA model regarding reducing the risk of healthcare associated infection. The results showed that head nurses' management in the plan phase was at a high level and they had kept to the hand washing protocol that is in accord with the WHO standard (M = 4.37, SD = 0.86). Head nurses' management in the do phase was at a high level and they had reduced the risk of infections through proper disposal of waste (M = 4.55, SD = 0.61). Head nurses' management in the check phase was at high level and they had monitored nurses in using personal protective equipment correctly (M = 3.94, SD = 1.12). Head nurses' management in the act phase was at a high level and they had evaluated the adequate resources to support the infection control programs that are always available for use (M = 3.69, SD = 1.16).

Table 11

Mean, Standard Deviation and Level of Head Nurses' Management

Regarding Reducing Risk of Healthcare Associated Infections (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
3	Kept to hand washing protocol according to the WHO standard	4.37	0.86	High
4	Set the protocol on the disposal of sharp objects and needles	4.37	0.88	High

6	Post hand washing guideline available across the unit	4.15	0.99	High
5	Plan to obtain all of infection cases	3.97	1.07	High
1	Set the goal of reducing risk of healthcare associated infection	3.91	0.96	High
2	Set the indicators for reducing risk of healthcare associated infection	3.80	1.06	High

Table 11 (continued)

No	Item	M	SD	Level
7	Prepare nurses to be qualified in infection control practices through education, training, experience, or certification	3.47	1.33	Moderate
<i>Do</i>				
2	Reduce the risk of infections through proper disposal of waste	4.55	0.61	High
6	Provide adequate resources to support the infection control program, such as personal protective equipment, washstand, hand washing jell	4.12	0.92	High
1	Ensure adequate equipment cleaning and sterilization and the proper management of laundry and linen	4.11	0.87	High
3	Track infection risks, infection rates, and trends in healthcare associated infections	3.91	0.93	High
5	Design coordination mechanism for all infection control activities that involves physicians, nurses, and others as appropriate to the size and complexity of the ward	3.16	1.23	Moderate
4	Arrange training or workshop to nurses to qualify in infection control practices	2.93	1.26	Moderate
<i>Check</i>				
3	Monitor nurses in using personal protective equipment correctly	3.94	1.12	High
1	Monitor the infection report from the unit level to hospital infection control unit	3.41	1.22	Moderate
2	Supervise the incident report of risk of healthcare associated infection	3.39	1.19	Moderate

Act

1	Evaluate the adequate resources to support the infection control program that is available to use every time	3.69	1.16	High
3	Supervise/ revise knowledge/ coordinate with infection control staff to update the knowledge of IC for nurses continuously	3.41	1.21	Moderate
2	Revise the form of infection control	3.33	1.23	Moderate

Head nurses' management regarding reducing the risk from fall

Table 12 shows the mean, standard deviation and level of head nurses' management using the PDCA model to reduce the risk from fall. The results showed that head nurses' management in the plan phase was at a high level and they had provided physical guidelines to identify patients with a high risk of fall ($M = 3.44$, $SD = 1.33$). Head nurses' management in the do phase was at a high level and they had kept patient's beds in good condition ($M = 4.45$, $SD = 0.73$). Head nurses' management in the check phase was at a high level and they had encouraged nurses to check the position of unconscious or semi-conscious patients ($M = 4.54$, $SD = 0.59$). Head nurses' management in the act phase was at a high level and they had evaluated the resources to prevent a fall ($M = 3.89$, $SD = 1.24$).

Table 12

Mean, Standard Deviation and Level of Head Nurses' Management

Regarding Reducing Risk From Fall (N = 123)

No	Item	M	SD	Level
<i>Plan</i>				
2	Provide assessment physical guideline to identify patient with high risk falls	3.44	1.33	Moderate
1	Provide assessment fall history guideline to identify patient with high risk falls	3.21	1.43	Moderate
3	Prepare the fall assessment form ready to use	3.01	1.37	Moderate

<i>Do</i>				
3	Keep patient beds in good condition	4.45	0.73	High
2	Provide safety environment through the unit such as light, slippery mat, and a hand-rail	4.33	0.84	High
4	Record fall incident	3.70	1.31	High
5	Provide the wet floor sign for fall prevention	3.68	1.21	High
1	Encourage staff nurses to uses fall assessment form	3.22	1.46	Moderate

Table 12 (continued)

No	Item	M	SD	Level
<i>Check</i>				
3	Encourage nurses to check the position of unconscious or semi-conscious patients	4.54	0.59	High
4	Check the environment such as the lighting and cleanliness of floor	4.32	1.04	High
2	Supervise the nurses to assess physical guidelines	3.68	1.19	High
1	Investigate nurses to assess fall history for reducing risk	3.55	1.22	Moderate
<i>Act</i>				
1	Evaluate the adequate resources to prevent fall	3.89	1.24	High
2	Revise the fall prevention guideline	3.58	1.32	Moderate

Part III Related Factors of Patient Safety Management

Tables 13 show frequency and percentage of related factors of head nurses management regarding patient safety. The age of subjects ranged from 25 years to 55 years with an average age of 37.51 years, the majority of the subjects (51.2%) were aged in the range ≤ 37.51 years old (SD = 6.02). More than half (51.2%) had bachelor degree in nursing and most of the subjects (61.8%) worked as a head nurse less than or equal to five years and almost half of them (43.1%) applied the team method as the type of nursing delivery in their unit.

Table 13

*Frequency and Percentage of Related Factors of Head Nurses' Management**Regarding Patient Safety (N = 123)*

Characteristics	n	%
Age (years)		
≤37.51	63	51.2
> 37.51	60	48.8
<i>(M= 37.51, SD = 6.02, min-max = 25-55)</i>		
Level of education		
Diploma	60	48.8
Bachelor	63	51.2
Years of experience as head nurse		
≤5	76	61.8
> 5	47	38.2
<i>(Median = 3.75, IQR = 4.92)</i>		
Type of nursing delivery		
Functional	36	29.3
Team	53	43.1
Mixed functional and Team method	34	27.6

Table 14 shows comparison of head nurses' management regarding patient safety and its related factors. Age, education, and working experience were tested to be compared with mean differences of head nurses by using independent t-test. Furthermore, the type of nursing delivery was tested by using a one way analysis of variance (ANOVA). The findings of this study showed that there was no significant mean difference in head nurses aged between ≤ 37.51 years and > 37.51 years regarding patient safety management ($t = 1.51, p = .13$). For education, the findings showed that there was no significant mean difference in head nurses who were educated and held a diploma or bachelor degree regarding patient safety ($t = 1.36, p = .17$). Moreover, the findings of working experience showed that there was no significant mean difference in head nurses who had working experience between ≤ 5 years and > 5 years regarding patient safety ($t = .37, p = .70$). The findings of type of nursing delivery showed that there was no significant mean difference between functional method, team method or mixed team and functional method ($F = 1.65, p = .19$).

Table 14

Comparison of Head Nurses' Management Regarding Patient Safety and Its Related Factors (N = 123)

Variable	Head Nurse Management		t/F*	p
	M	SD		
Age (year)				
≤ 37.51	340.44	50.84	1.51	.13
> 37.51	326.93	47.72		
Education				
Diploma	327.63	58.08	1.36	.17

Bachelor	339.77	39.48		
Working Experience (year)				
≤5	335.18	53.75	0.37	.70
> 5	331.70	42.52		
Type of nursing delivery *				
Functional	345.33	55.61	1.65	.19
Team	325.96	45.78		
Mixed team and functional	333.85	47.66		

Discussion

This section presents discussions of the findings corresponding to the study objectives and research questions. The study examined relationships between head nurses' management regarding patient safety and its related factors in public hospitals in Aceh province, Indonesia. Based on the findings, various important features were discussed as follows: management of patient safety, and its related factors.

Head Nurses' Management Regarding Patient Safety

The result showed that the overall mean score of each dimension of management, including identifying patients correctly (M = 52.78, SD = 6.21), improving effective communication (M = 49.04, SD = 7.08), maintaining safety of high alert medication (M = 58.74, SD = 8.95), ensuring correct procedures (M = 48.66, SD = 7.93), reducing the risk of healthcare associated infections (M = 72.00, SD = 13.95), and reducing risks from fall (M = 52.60, SD = 12.18), were at a high level.

More than half of head nurses set the KPI for safety management (52.0%), it might be related to the high level of management in patient safety (Table 3).

The goal of head nurses in nursing administration is to achieve quality and one component of quality is patient safety. In the following idea, Enterkin et.al (cited in Severinsson, 2013) mentioned a leadership role is a core component in the provision of quality care that promotes a higher quality and influences improvement of patient safety practices. One job of leadership is to be able to supervise. The result of this study showed that head nurses were more likely to supervise (76.4%).

One exceptional finding in the management of patient safety was that this high level might be connected to majority of head nurses who had set the plan (93.5%) for safety management and set the PDCA for management patient safety (87.8%). More than half of the head nurses had implemented (65.5%) and evaluated safety management (63.4%).

Furthermore, the common reason head nurses perform high level in management regarding patient safety might be due to their role of nursing manager in managing staff, financial and any resources to ensure safety and quality care for patients. Wong and Cummings (2007) noted that significant evidence showed association between nurse manager and adverse events. Moreover, Kerfoot (2009) added that head nurses were obligated to provide safety work environment. Head nurse must influence their staff in to fully functioning professional practice by clearly describe role of nurses and ensuring their nurses were met safety standard for every procedure and patients as well.

Considering each dimension of head nurses' management regarding patient safety, the total score of identifying patient correctly was at high level ($M = 52.78$, $SD = 6.21$). It is vital that patients are correctly identified before providing healthcare

services. A patient identification process should be an integral part of patient care. Head nurses have ordered to the nurse for ensuring the presence of the identity band at every shift change or every intervention given. Identifying patient correctly is the first nurse's effort to prevent error for the patient before providing intervention. In contrast, no matter nurses provided a correct intervention but not match with the correct patient, this will lead to error and directly harm to the patient. In addition, head nurses have commanded to nurses to check patient's identities that should not only take place at the beginning of a care episode but should be continued at each patient intervention through the visits to maintain the patient safety. As well as the demographic finding of this study that found majority (76.4%) head nurses supervised nurses about patient safety management. It could be said that head nurses' management regarding patient safety in identifying patients correctly at public hospitals in Aceh province has been constructed.

Vredenburgh and Zackowitz (2009) stated that an accurate identification of a patient is not a trivial task. The reliability and consistency of patient information are also contributing factors to success of efforts to improve patient safety outcomes through good collaboration. The most common approach to patient identity management utilizes the master patient index (MPI) of an existing core application, such as health electronic record (HER), hospital information system (HIS) or practice management system.

The level of improving effective communication was high ($M = 49.04$, $SD = 7.08$). Effective communication is so important in nursing delivery in order to allow nurse to effectively respond the patients' need. Head nurses realized that working in ward as a team and need good communication to maintain the team.

Furthermore, head nurses implement an effective communication among nurses. Head nurses have set the measure to nurses to apply for post conference before shift change in order to communicate patient condition. In order to minimize the error during communication head nurse has evaluate the effective communication. As showed in demographic finding in this study, evaluate the safety management (62.6%) and adjust the safety management (63.4%). Which is congruent with the study by Lee (2012) which found that after the leader and team attended the course that was developed by the researcher, results indicated that participants and their managers perceived clear improvements in the communication culture of patient safety. Due to miscommunication involved in the great majority of adverse patient outcomes, improving communication skills has been a key objective in bringing team resource management to reduce adverse patient events during hospitalization.

In addition, head nurses recognized that communication is a nature of nursing care delivery that is one patienttakes care by more than one nurse in 24 hours. Furthermore, nurses have to collaborate with multidiscipline of healthcare, and head nurses give clear information to build an effective communication.

Furthermore, in order to improve effective communication in patient safety, head nurses must give clear instructions regarding staff assignments. Effective communication ensures that all parties are in alignment with whatever situation emerges. Effective communication does not only mean face to face, sharing information and telling team members what to do, but also using a historical approach, supervising and evaluatingeffectivecommunication among nurses (Kelly, 2011).

The maintaining high alert medication was at high level ($M = 58.74$, $SD = 8.95$), which is congruent with demographic data that inform the guideline to achieve safety high alert medication by using the five right methods. Adopting the right medication in the ward will minimize the error all stages of the medication process because medication errors can arise in drug selection, prescribing, dispensing, administration and therapeutic monitoring. Maintaining high alert medication is a crucial part in patient safety management and head nurses have paid a serious attention due to high alert medications are directly impact to patient live. Furthermore, in order to limited access to the high alert medication (HAM) head nurses also provide the medication room in their ward. As supported information from demographic finding in this study more than half (71.5%) head nurses had arrange the medication room within the ward.

In related to high-alert medications, head nurses are required to perform special considerations to ensure safe medication practices and to eliminate medication errors that cause harm to patients. The plan of head nurses in maintaining HAM is identifying all high-alert drugs, and establish policies and processes to minimize the risks associated with the use of these drugs (Graham, Clopp, Kostek, & Crawford, 2008).

Furthermore, a head nurse as a manager in a unit lists the medications required and uses this list to reduce the risk of errors. In addition, safeguards may include strategies such as standardizing the ordering, storage, preparation, and administration of these products; improving access to information about these drugs for all nurses in the ward, limiting access to high-alert medications, using auxiliary labels and automated alerts; and employing redundancies such as automated or

independent double checks when necessary (Institute for Safe Medication Practices, 2012).

Ensuring correct procedure was at high level ($M = 48.66$, $SD = 7.93$), which is congruent with head nurse provided patient inform consent for any intervention. Head nurses have to incorrect procedure that will lead to adverse patient event including permanent disability and extra charge. Based on demographic finding of this study showed that incident in correct procedure still occur (4.1%) even though head nurses in correct procedure have managed their ward. It might be contributed by workload in the ward, nurse have to take care more several patient patients in each shift.

Department of Health (2000) found that 70% of adverse incidents are preventable. However, errors can be minimized but they will never be completely eliminated. Measures also need to be taken to limit the adverse consequences of those errors that still occur with designing or modifying systems so that they are better able to tolerate inevitable human errors and contain their damaging consequences.

The reducing healthcare associated infections were at high level ($M = 72.00$, $SD = 13.95$). Healthcare associated infections are infections acquired as a consequence of person treatment by nurses or other caregiver. Head nurse has managed the ward by provide the personal protective management, hand washing and environmental cleaning. Besides that, incident in infection still occur as showed in table 3 (23.6%), it might be contributed by limited resources in some hospitals.

Peate(2010) noted that hand hygiene significantly reduces the number of disease-causing microorganisms on hands and arms and can minimize cross-contamination from health worker to patient. The indications for hand hygiene are

paramount, in order to minimize the risk of occupational infection, leaders as nurse administrator sets hand-washing protocols and posts the protocols across unit.

Planning of hand washing includes covering lesions on the hand with waterproof dressing, pre-employment health screening, reporting accidents and adverse events and counseling and support for the staff.

Besides that, head nurses provide training in preventing pathogen exposures. Clinical nurses and other healthcare staff should receive additional infection control training and periodic evaluations of aseptic care as a planned patient safety activity. Nurses have the unique opportunity to directly reduce healthcare associated infections through recognizing and applying evidence-based procedures to prevent HAIs among patients and protecting the health of the staff. Clinical care nurses directly prevent infections by performing, monitoring, and assuring compliance with aseptic work practices; providing knowledgeable, collaborative oversight on environmental decontamination to prevent the transmission of microorganisms from patient to patient; and serve as the primary resource to identify and refer ill visitors or staff (Collins as cited in Hughes 2008).

Reducing risk of fall was high level ($M= 58.74$, $SD= 8.95$) might be good in maintaining the environment including keeping patient's beds in good condition. Head nurses seek to reduce the number of fall by providing a safe environment, recording fall incidents, and encouraging staff to identify the patients at risk of fall. Miake-Lye, Hempel, Ganz, and Shekelle(2013)cited that fall has been associated with the increase in healthcare utilization, including increased length of stay and higher rates of discharge from hospitals into long-term care facilities. Even a

fall that does not cause an injury can trigger a fear of falling, anxiety, distress, depression, and reduced physical activity.

Furthermore, the common reason that head nurses' management in reducing risk of fall was at high level was due to head nurses have applied assessment tool for fall. Using assessment tool for fall are very useful to identify potential risk of fall in order to reduce fall incident in ward. Several risk factors for fall are identified such as advanced age, muscle weakness, gait, balance problem, visual impairment, altered bowel, vertigo, cognitive deficits, use of psychotropic medications and history of fall. A study in Mayo clinic, Rochester examined risk of fall in neurology inpatient unit to compare pre and post intervention for risk of fall assessment tool. The study showed that the rate of fall after implementation of the assessment tool was significantly lower than before (Hunderfund, Sweeney, Mandrekar, Johnson, & Britton, 2011). Thus head nurses may realize that using risk of fall assessment tool will be able to guide them to prevent adverse event particularly in reducing fall and elaborate these assessment tool in their patient safety management system.

Related Factors of Head Nurses' Management Regarding Patient Safety

The related factors of head nurses' management regarding patient safety consisted of 1) age, 2) level of education, 3) years experiences as head nurse and 4) type of nursing delivery applied in their ward.

The findings of the study showed that there was no significant mean difference in head nurses who has age between ≤ 37.51 years and > 37.51 years regarding patient safety ($t=1.51, p=.13$). According to International Council of Nurses (2012) nurse no matter how old she/he is, every head nurse carries personal

responsibility and accountability for nursing practice, and for maintaining competency. Nurses maintained a standard of professional health. Similarly, Mayo and Duncan (2004) mentioned that no studies showed strong relationship between age of nurse and number of medication error. In addition, it indicated that any nurse is potentially at risk in making error.

Furthermore, the findings of the study showed that there was no significant difference in head nurses who had a diploma or bachelor degree in nursing. It can be interpreted that management regarding patient safety was still keep in their mind. Head nurses as health professionals must maintain their safety competencies from the environment of education to the healthcare service. According to Ridley (2008) in review of the study using retrospective design, it was found that there was no significant association between the level of education and the number of patient mortality during hospitalization. Chenot and Daniel (2010) revealed that nursing education has developed a framework that bears emphasis on patient safety. It is important that nurse educators communicate a vision of safety to the students and a sense of personal responsibility for assuring that good planning for addressing errors is a priority in future professional practice. This should lead to all head nurses, regardless of their level of certification, applying this concept in the workplace. In contrast, a study by Aiken, Clarke, Cheung, Sloane, and Silber (2003) found that a positive relationship between nurse's educational levels and reduced mortality or failure to rescue in orthopedic and vascular surgery exists.

Working experience showed no significant difference with head nurses management regarding patient safety. This finding was congruent with a previous study by Aiken, Clarke, Cheung, Sloane, and Silber (2003), which found that nurse

experience was not significant in predicting mortality or failure to rescue, in orthopedic and vascular surgery. In addition, since 2009 Indonesia's Hospitals Patient Safety Committee has developed hospital patient safety standards in hospitals and an accreditation standards instrument. Accreditation of hospital is a necessary condition that must be applied in each hospital in Indonesia as mandated by law no 44 of 2009 (Lumenta as cited in WHO, 2007). Furthermore, since 2011 the Indonesian Ministry of Public Health has adopted the Patient Safety Goals policy from the Joint Commission International and has implemented this policy to all healthcare settings throughout the country. The patient safety goals statements are elaborated in the policy statement of the Health Minister in Chapter IV, Verses 1 and 2.

The type of nursing delivery showed no significant difference in head nurses' management regarding patient safety. Models of nursing delivery referred to the way in which nurses organized the working environment in order to deliver patient care. The model of care is an overarching design for the provision of a particular type of nursing care service that is shaped by a theoretical basis, EBP and defined standards (Davidson, Halcomb, Hickman, Phillips, & Graham, 2005).

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This descriptive correlational study was designed to describe and examine relationships between head nurses' management regarding patient safety and its related factors in public hospitals in Aceh province, Indonesia. The study was conducted at 14 public hospitals in Aceh province. Subjects were selected by systematic and random sampling of 133 nurses working at these 14 hospitals with at least one year of working experience. After disregarding the missing and incorrect data, the data from 123 subjects were used to be analyzed the results of the study. Data were collected by using a questionnaire from January to March 2013.

Subjects were asked to respond to a questionnaire consisting of two sections: Section I demographic data form and Section II head nurses' management regarding patient safety.

The content validity of questionnaires was tested by three experts and the reliability of head nurses' management regarding patient safety was .92. Data were analyzed by using frequency, percentage, mean, and standard deviation. An independent *t-test* was used to compare mean differences of head nurses' management regarding patient safety and related factors including age, level of education and experience as head nurse. Furthermore, a one way analysis of variance (ANOVA) was used to compare the mean difference between head nurses' management regarding patient safety and types of nursing delivery.

A brief summary of the study findings, strengths, limitation, and recommendation is described below.

Summary of the Study Findings

There were 123 subjects completed data used to analyze results of the study. The majority of the subjects (51.2%) were aged in range of ≤ 37.51 years old (SD = 6.02) and most of them (74.8%) were female. All of the subjects were Muslim (100%) and more than half (51.2%) had a certificate bachelor degree in nursing. Most of the subjects (61.8%) worked as a head nurse for less than or equal to five years and almost half of them (43.1%) applied the team method as type of nursing care in their unit and the majority of subjects (71.5%) arranged the medication room.

Overall, the head nurses used the PDCA model toward patient safety and their performance was found to be at a high level (M=333.85, SD=49.61). With regard to management in each dimension, identifying patients correctly (M=52.78, SD=6.21), improving effective communication (M=49.04, SD=7.08), maintaining safety of high alert medication (M=58.74, SD=8.95), ensuring correct procedures (M=48.66, SD=7.93), reducing the risk of healthcare associated infections and reducing the risk from falls (M=52.60, SD=12.18), it was found to reflect a high level of performance regarding patient safety. The study found no significant mean differences regarding the subject's age ($t = 1.51, p = .13$), education ($t = 1.36, p = .17$), working experience ($t = .37, p = .70$) and type of nursing delivery ($F = 1.65, p = .19$).

Strengths and Limitations

The finding of this study can be viewed as an overview of management regarding patient safety. The study was initially designed to reduce adverse event,

error and mortality in public hospital. Furthermore, head nurse's management regarding patient safety was a strategy to ensure patient safety during hospitalization.

Along with the strengths, however, the study also had some limitation. Firstly, the instruments used in this study were first employed in Aceh. Even though each instrument was examined for content validity and reliability, the conceptual structure had not yet been determined. The second limitation was length of the questionnaires that more than 100 items. The questionnaires required a lot of time for the subjects to complete with full concentration that might have affected the subjects in answering the questionnaire frankly and truthfully.

Implication and Recommendations

This study examined the head nurses' management regarding patient safety and its related factors in public hospitals. Referring to the findings of the study, following recommendations are offered:

Nursing Practice

The results of this study posit that head nurses' management and related factors are not interrelated. These findings can be generalized to all head nurses who work in other hospitals of Indonesia. Therefore, head nurses' could improve their management skill. Furthermore, nurse administrator conduct the training program related to patient safety for head nurses to improve their skill in managing patient safety.

Nursing Education

The findings from this study help Indonesian nurses the growing knowledge related management particularly in patient safety and its related factors. The concept of patient safety, management and PDCA model should be included in nursing courses. In addition, it will be helpful for nursing educators to teach their students about the important of management regarding patient safety in order to increase patient safety and healthcarequality in the future.

Nursing Research

In this study, personal factors of head nurses are investigated in related factor. However, there are many other factors related to head nurses' management regarding patient safety and further study should include other factors. More evidences linking to management regarding patient safety are needed.

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APPENDICES

Appendix A

Informed Consent Form

Study title : Head Nurse's Management Regarding Patient Safety and Its related factor in Public Hospitals, Aceh Province, Indonesia

My name is Yuswardi, I am a master student of the Faculty of Nursing, Prince of Songkla University, Thailand. I am now conducting a study, purposing to identify the level of head nurses' management regarding patient safety and to determine the relationship between head nurse's management regarding patient safety and its related factor in public hospital, Aceh Province, Indonesia.

The study and its procedures have been approved by appropriate people and the Research Ethics Committee of Prince of Songkla University, Thailand. I invite you to join this research. You will be asked to complete the questionnaires that may take about 1 hour of your time and return the questionnaires to the researcher within 3 to 4 days. A code number is used so that your identity will not be discovered and I will keep your information confidential. Neither your name nor any identifying information will be used in the report of the study, and finally, the questionnaires will be destroyed after the completion of the study.

Your participation in this study is voluntary. There is no discomfort risk or negative consequences to participate or not participate in this study. You also can withdraw from the research anytime if you want. Your signature on this form or

only returning the completed questionnaires indicates that you understand and are willing to participate in this research without pressure from anyone.

Date:.....

Date:.....

Participant

Researcher

()

(Yuswardi)

Thank you for your participation. If you have any inquiries, please contact me or my advisor (Assoc. Prof. NongnutBoonyoung, RN, Ph.D).

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Cover Letter

Master Nursing Science (International Program), Faculty of Nursing
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To: Head Nurse

My name is Yuswardi and I am studying a Master Degree of Nursing at the Faculty of Nursing, Prince of Songkla University, Thailand. I am conducting a research study entitled “Head Nurses’ Management Regarding Patient Safety and Its Related factor in Public Hospitals, Aceh Province, Indonesia”

To ensure the results of this study is of benefit to your unit, the completed response from you is important. This is a self-reported questionnaire which you are required to read every question and fill in by yourself. Please do not ask other people, friends, open a book, or work together to answer questions. You should not be afraid of an incorrect answer as it has no right and wrong answer and no consequences to your career, and finally the results of this study will provide information about head nurses’ management regarding patient safety.

If you have completed the questionnaire, please return it to the researcher. If you are inconvenient or have any problems with the return process, please give me a call at this number +6281360311830. Thank you very much for your attention and cooperation.

Yours sincerely

Yuswardi

(Researcher)

APPENDIX B

Demographic Data Questionnaire (DDQ)

Code :.....

Date :.....

Instruction: Please fill in the blank and give mark (√) in the bracket appropriate to your answer where indicated. Thank you.

1. Age :.....years
2. Gender : () 1. Male () 2. Female
3. Religion
 - () 1. Islam () 2. Christian/Catholic
 - () 3. Buddhist () 4. Hindu
 - () 5. Other Religion
4. Level of Education
 - () 1. Diploma
 - () 2. Bachelor
 - () 3. Master
5. Period of working in current unit:years.....months
6. What type of nursing care service in your ward is?
 - () 1. Functional
 - () 2. Team
 - () 3. Team mix with functional
 - () 4. Others.....
7. Have you arranged a medication room in your ward?
 - () 1. Yes
 - () 2. No

8. During these 2 months, in your ward, do you have any incident in patient identification?
- () No
- () Yes, please identify the incident Time/month
9. During these 2 months, in your ward, do you have any incident in reporting/documentation?
- () No
- () Yes, please identify the incident Time/month
10. During these 2 months, in your ward, do you have any incident in medication error?
- () No
- () Yes, please identify the incident Time/month
11. During these 2 months, in your ward, do you have incident in patient surgery?
- () No
- () Yes, please identify the incident Time/month
12. During these 2 months, in your ward, do you have any incident in risk of health care associated infection?
- () No
- () Yes, please identify the incident
- Urinary tract Infection (UTI) Time/month
- Surgical incision site infection (wound infection)Time/month
- Pneumonia (VAP) Time/month
- Bloodstream infection Time/month
13. During these 2 months, in your ward, do you have any incidence in patient falls?
- () No
- () Yes, please identify the incident Time/month

14. Do you have good management in your ward?

No

Yes

15. Do you set plan for safety management?

No

Yes

16. Do you set PDCA (Plan, Do, Check and Act) as your management for patient safety?

No

Yes

17. Do you satisfy with safety management in your ward?

No

Yes

18. Do you achieve Key Performance Indicator (KPI) for safety management in your ward?

No

Yes

19. Do you set a policy for patient safety management in your ward?

Less likely

Some

Most likely

20. Do you supervise nurse about patient safety management?

Less likely

Some

Most likely

21. How often you modify patient safety policy in your ward?

Less likely

Some

Most likely

22. Do you implement the safety management in your ward?

Less likely

Some

Most likely

23. Do you evaluate for the safety management in your ward?

Less likely

Some

Most likely

24. Do you adjust the safety management in your ward?

Less likely

Some

Most likely

25. What is your perception level about identify patient correctly in your ward?

Low

Moderate

High

26. What is your perception level about the effective communication in your ward?

Low

Moderate

High

27. What is your perception level about the correct procedure in your ward?

Low

Moderate

High

28. What is your perception level about reducing risk of health care associated infection in your ward?

Low

Moderate

High

29. What is your perception level about reducing risk from fall in your ward?

Low

Moderate

High

APPENDIX C

Head Nurses' Management Regarding Patient Safety Questionnaire (HNM-PSQ)

Instruction: Please read the following statement carefully and give mark (√) on appropriate number that indicates your management regarding patient safety. Five possible options for each statement will indicate your management regarding patient safety including: 5= perform exactly as the item stated, 4= much likely perform as item stated, 3= moderate perform as item stated, 2= less perform as itemstated and 1 = do not perform as the item stated.

IDENTIFY PATIENT CORRECTLY

Head nurse management to prevent making mistakes in identifying patient during hospitalization by
PLAN

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Inform the goal of ensuring identify patient correctly based on hospital standard. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Inform the policy regarding patient identification that all nurses should follow strictly. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Set the double check guideline to identify patients correctly in order to prevent error in patientwho has similar name. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

DO

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Explain to all nurses to identify the patient correctly by asking the patient to name (first name and surname or father's name), date of birth or address. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Emphasize patient identification policy for all nurses have primary responsibility for check and verifying a patient's identity before intervention given. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Explain to all nurses to cross check to confirm patient identification details and demographic details with the patient's health records. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

IDENTIFY PATIENT CORRECTLY

Head nurse management to prevent making mistakes in identifying patient during hospitalization by **CHECK**

- 1. Check the patient’s medical record and nursing needs based on identifiers from the initial assessments. 5 4 3 2 1
- 2. Check laboratory results available in a timely way as defined by the hospital standard. 5 4 3 2 1
- 3. Patient needs are prioritized based on the patient’s condition at the time of admission. 5 4 3 2 1

ACT

- 1. Investigate all of patient misidentification, ensuring actions to prevent reoccurrence are implemented. 5 4 3 2 1
- 2. Modify the guideline for identifying patient correctly. 5 4 3 2 1
- 3. Re-set the supervision technique for identifying patient correctly. 5 4 3 2 1

IMPROVING EFFECTIVE COMMUNICATION

Head nurse management to prevent making mistakes in communication during hospitalization by **PLAN**

- 1. Set the protocol to achieve effective communication both of verbal communication and telephone orders. 5 4 3 2 1
- 2. Inform the hand over guideline (situation, background, assessment and recommendation) for communication among nurses. 5 4 3 2 1

IMPROVING EFFECTIVE COMMUNICATION

Head nurse management to prevent making mistakes in communication during hospitalization by **DO**

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Encourage all nurses to record the situation, background, assessment and recommendation in patient file. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Provide hand over form (situation, background, assessment and recommendation) as a communication record during hand over among nurses. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Encourage all nurses to use hand over guideline during changing shift. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

CHECK

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Check the use of hand over form in patient file. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Compare incident report with expected goals. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ACT

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Evaluate and modify the hand over form that is available to use every time. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Evaluate the incident of effective communication. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Evaluate nurses in utilization of all form. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Supervise the effective communication continuously. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 5. Develop a meeting when the unit has problem about communication. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

MAINTAINING HIGH ALERT MEDICATION

Head nurse management to maintaining high alert medication during hospitalization by

PLAN

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Inform the goal of safety high alert medication based on hospital standard. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Inform the guideline to achieve safety high alert medication by using five right methods (5R). | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Set the guideline to achieve safety high alert medication by double check with the medical administration record (MAR) . | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Prioritize the processin giving high alert medication. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

DO

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Emphases for all nurses to use five right methods (5R) before medicine are given to patient. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Encourage all nurses to do double check with the medical administration record (MAR) method before medicines are given to patient. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Arrange the medicine which look-alike or sound-alike obviously. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Monitor high alert medication side effect. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

CHECK

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Monitor the staff nurses compliance to the high alert medication regarding conducting meeting evaluation. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Audit the incident report particularly in high alert medication administration. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Check the system of providing high alert medication. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

MAINTAINING HIGH ALERT MEDICATION

Head nurse management to maintaining high alert medication during hospitalization by ***ACT***

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Evaluate the document of medication sheet including fiveright method (5R). | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Supervise the safety high alert medication continuously. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Consult with medical doctor/pharmacist about high alert medication. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ENSURING CORRECT PROCEDURE

Head nurse management to prevent making mistakes in procedure during patient hospitalization by ***PLAN***

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Plan the materials for ensure correct procedure. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Set the indicators for patient safety in ensure correct site, correct procedure, and correct patient surgery. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Set the unit policy for Attach procedure safety checklist form in patient folder. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Provide patient inform consent for any intervention. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

DO

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Supply the procedure safety checklist promptly to nurse | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Supply patient inform consent for any intervention | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Explain to all nurses how to apply patient informed consent that has to fill out by patient/family members/significant who will get any intervention. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ENSURING CORRECT PROCEDURE

Head nurse management to prevent making mistakes in procedure during patient hospitalization by
CHECK

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Audit the progress of staff nurses' compliance to safety procedure | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Supervise the incident report of any intervention | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Recording incident data in monthly record | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ACT

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Evaluate the availability of form for safety procedure. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Evaluate the availability of form of patient inform consent. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

REDUCING RISK of HEALTH CARE ASSOCIATED INFECTION

Head nurse management to reduce risk of healthcare associated infection during patient hospitalization by
PLAN

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Set the goal of reducing risk of health care associated infection that appropriate with hospital standard such as blood stream infection/ pneumonia (VAP)/UTI / surgical wound infection etc. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Set the indicators for reducing risk of health care associated infection. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Provide hand washing protocol that appropriate with WHO or center for diseases control. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Set the protocol on the disposal of sharps and needles. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ENSURING CORRECT PROCEDURE

Head nurse management to prevent making mistakes in procedure during patient hospitalization by

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 5. Plan to obtain all of infection cases. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 6. Post hand washing guideline available across the unit. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 7. Prepare nurses to be qualified in infection control practices through education, training, experience, or certification. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

DO

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Ensure adequate equipment cleaning and sterilization and the proper management of laundry and linen. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Reduce the risk of infections through proper disposal of waste. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Track infection risks, infection rates, and trends in healthcare associated infections. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Arrange training or workshop to nurses to qualify in infection control practices. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 5. Design coordination mechanism for all infection control activities that involves physicians, nurses, and others as appropriate to the size and complexity of the ward. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 6. Provide adequate resources to support the infection control program, such as personal protective equipment, washstand, hand washing jell. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

CHECK

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Monitor the infection report from the unit level to hospital infection control unit. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Supervise the incident report of risk of health care associated infection. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Monitor nurses in using personal protective equipment correctly. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ENSURING CORRECT PROCEDURE

Head nurse management to prevent making mistakes in procedure during patient hospitalization by
ACT

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Evaluate the adequate resources to support the infection control program that is available to use every time. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. revise the form of infection control . | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Supervise/ revise knowledge/ coordinate with infection control staff to update the knowledge of IC for nurses continuously. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

REDUCING RISK FROM FALL

Head nurse management to prevent patient fall during hospitalization by
PLAN

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Provide assessment fall history guideline to identify patient with high risk falls. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Provide assessment physical guideline to identify patient with high risk falls. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Prepare the fall assessment form ready to use. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

DO

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Encourage staff nurses to uses fall assessment form. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Provide safety environment through the unit such as light, slippery mat, and a hand-rail. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. Keep patient beds in good condition. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Record fall incident. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 5. Provide the wet floor sign for fall prevention. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

REDUCING RISK FROM FALL

Head nurse management to prevent patient fall during hospitalization by
CHECK

- | | | | | | |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Investigate nurses to assess fall history for reducing risk | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Supervise the nurses to assess physical guideline. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 3. encourage nurses to check the position of uncontroled or semiconscious patients | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 4. Check the environments such as lightness and the cleanliness of floor. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

ACT

- | | | | | | |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1. Evaluate the adequate resources to prevent fall. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |
| 2. Revise the fall prevention guideline. | <input type="text" value="5"/> | <input type="text" value="4"/> | <input type="text" value="3"/> | <input type="text" value="2"/> | <input type="text" value="1"/> |

APPENDIX D

List of Experts

Three experts validated the content validity of the demographic data questionnaire, head nurses' management regarding patient safety and its related factors in public hospitals Aceh Province, Indonesia, they are:

1. Dr. Luppana Kitrungrrote
Nursing Lecture Faculty of Nursing Prince of Songkla University
2. Dr. Hathairat Sangchan
Nursing Lecture Faculty of Nursing Prince of Songkla University
3. Assoc. Prof. Dr. Pajongsil Perngmark
Nursing Lecture Faculty of Nursing Prince of Songkla University

VITAE

Name Mr. Yuswardi
Student ID 5410420037

Educational Attainment

Degree	Name of Institution	Year of Graduation
Bachelor of Nursing	Syiah Kuala University of Aceh, Indonesia	2009

Scholarship Awards during Enrolment

Project	Granting agency	Year
Aceh Scholarship Commission	Aceh Government, Indonesia	2011-2013

Work-Position and Address

Lecturer at Nursing School, Faculty of Medicine Syiah Kuala University

Jln. Tgk. TanohAbee, Darusslama, Banda Aceh, 23111, Aceh, Indonesia

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List of Publication and Proceeding

Yuswardi, Boonyoung, N., &Thiangchanya, P. (2012, October). *Patient safety in nursing: A literature review*. Poster session at the Kunming International Nursing Conference, Kunming: China.

Yuswardi, Boonyoung, N., &Thiangchanya, P. (2013). Patient safety in nursing administration: A literature review. *ASEAN Academic Community International Conference*, 43-47.