Patient Safety in Nursing Administration:
A literature Review

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Abstract— Purpose: To presents a literature review of patient safety in nursing to achieve quality that may contribute in nursing care. Method The research articles were reviewed from electronic databases including Science Direct, CINAHL, PubMed, Pro Quest and from relevant textbooks was conducted. The numbers of keywords were used including patient safety, PDCA, Six sigma, HFMEA, RCA. Result: The findings showed that patient safety is a nurse’s effort to prevent or reduce patient harm from both actual and potential risks that could harm patients during treatment. There are several dimensions adopted by hospitals to effectively manage patient safety, such as building safety culture, leading and supporting staff, integrating risk management activity, promoting report writing, involving and communication with patient1 and the public, learning and sharing safety lessons and implementation of solution6 to prevent harm. Moreover, unsafe situation can occur in a Microsystem in nursing care that is from the immediate environment, where nurse and patient interaction occurs. Failure in the nursing care process result in material losses, increased length of stay, disability and death. Patient safety research has been undertaken in different ways such as retrospective review of medical records, survey or cross-sectional study, qualitative study including focus group discussion, ethnography, mixed method and intervention. Furthermore, to achieve patient safety, many tools have been used such as PDCA cycle, six sigma model, Health Failure Mode Effect Analysis (HFMEA), Root Cause Analysis (RCA) and SIMPLE model.

Keywords: patient safety, PDCA, Six sigma, HFMEA, RCA, SIMPLE Model.

I. INTRODUCTION
Patient safety is avoidance of error and adverse event during hospitalization. Patient safety is a multi-pronged challenge1, international priority and a big issue in health care because of patients are at risk during hospitalization2. The significant findings showed that unsafe and patient errors during hospitalization, at least 1 to 2 of 20 patient admitted to health care suffered an adverse event and die as a consequence, furthermore at least 10,000 every years patient deaths and permanent disability caused by adverse event in health care3, 4, injured or mistaken in treatment such as hospital acquired infection, equipment error and surgical complication5-7. In order to minimize the adverse event, nurse as hands on caregiver makes a major contribution to performs a patient surveillance system and has essential role for the prevention and early detection of adverse patient event by devising strategy to assessing, planning, and evaluating patient needs, delivering treatment and medication advocating for patient and ensure the patient safety8.

II. METHOD
The research articles were reviewed from electronic databases including Science Direct, CINAHL, PubMed, Pro Quest and from relevant textbooks was conducted. The numbers of keywords were used including patient safety, PDCA, Six sigma, HFMEA, RCA.

III. RESULT and DISCUSSION
Understanding of the definition and Classification of patient safety is better realize and communicate about hazards, common sources of risk and strategies to improve patient safety. The consistent use of key patient safety concepts with agreed definitions and preferred terms, in conjunction with a comprehensive. In short, learning patient safety classification must be deeply integrated in all work on patient safety around the world.

The model of patient safety improvement can be varied in different hospital. Every organization needs to use a proper combination and selection of model in their implementation process. It is very important that the tools, model are properly selected according to the need and demands of the situation and further applied correctly to the appropriate process and approach in patient safety. The PDCA model is more than just a quality tool for patient safety. The PDCA model is a fundamental model of continuous improvement processes. The most important aspect of PDCA model is lies in the “act” stage after the completion of a project when the cycle starts again for the further improvement, otherwise apply PDCA model in healthcare need strong support from leader and have a good team work.

Furthermore implementing six sigma in health care have been on reducing error and enhancing patient safety. The goal of apply six sigma in hospital is to reducing error
reporting and relieve a blame-free culture. Six Sigma very powerful, support by data driven and high effort to reduce error and enhance patient safety in healthcare system, but in the other hand, deploy six sigma in hospital is need detail information and high knowledge of quality assurance.

Moreover, root cause analysis (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, unless, using RCA as model to identify adverse event is difficult if hospital have lack information and poor documentation.

**Concept of patient safety**

The past 10 years since IOM raised the issue related to patient safety, patient safety has rapid growth in research and action on patient safety throughout the world [9]. Study of patient safety is a welcome development. In fact, patient safety appears to be a field of scientific endeavour in which identical terms are often understood to mean quite different things, depending on the standpoint of individuals involved and area of the study in patient safety [10].

Australian Institute of Health and Welfare [11] mention that the definition of safety is to avoid or to reduce the danger of actual, potential risk and are not in the desired outcome can be prevented or minimized. Patient safety is focusing in the reporting, analysis, and prevention of medical error that often cause to adverse health care event. Before 1990's, the evidence was under-report and gained less attention. Report of multiple countries about numbers of patient harmed and killed by medical error, had experienced in medical error, the ratio of incident show that at least 1 of 10 patient around the world. Report of the Institute of Medicine (IOM) in October 1999 explained that "err is human: building a safer health care system". This report put the issue in front of American public and the agendas of health care institution. Media in America and National news network finding that more than 98,000 people died in hospital every as a result of medical error and unnumered more seriously harm [12].

Understanding the definition and Classification of patient safety is the means to better realize and communicate about hazards, common sources of risk and strategies to improve patient safety. The consistent use of key patient safety concepts with agreed definitions and preferred terms, in conjunction with a comprehensive but adaptable classification, paves the way for the systematic collection, aggregation and analysis of relevant information. In short, classification must be deeply integrated in all work on patient safety around the world [10].

**Dimension of patient safety**

Some scholar said that several dimensions of patient safety including seven steps and 12 dimensions [13] were as follow, step 1 build a safety culture Create 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 and identify and assess 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 and listen to patients, step 6 learn and share safety lessons to encourage staff to use root cause analysis to learn how and why incidents happen and the last, step 7 implement solutions to prevent harm Embed lessons through changes to practice, processes or systems.

The 11 dimensions of patient safety mentioned by Agency for Healthcare Research and Quality were as followed 1) teamwork within units, 2) supervisor/manager expectation and action promoting patient safety, 3) managing support for patient safety, 4) organizational learning – continuous improvement, 5) overall perception of patient safety, 6) feedback and communication about safety, 7) communication openness, 8) frequency of even reported, 9) teamwork across unit, 10) staffing and 11) handoffs and transition and nonpunitive response to error [14].

A huge number of people are treating and care in healthcare have high potential risk for patient, among complex activity in treatment sometime go wrong or near miss and as a result patients are harmed. Seven steps of safety for primary care guided for caregiver, the most essential for staff who has responsible for clinical, risk management and managed staff [13]. The seven step including 1) Build a safety culture,2) lead and support staff, 3)Integrate the risk management activity, 4) Promote reporting, 5) Involve and communicate with patients and the public, 6) Learn and share safety lessons, 7) Implement solutions to prevent harm

**Model used to achieve Patient safety**

1. **PDCA (Plan - Do - Check - Act) cycle**

PDCA model is refers to as Deming circle. 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 [15].

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 [16]. PDCA cycle will determine success and effectiveness of the improvement program [17].

The PDCA cycle is more than just a tool; it is a concept of continuous improvement 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 [16].

2. **Six sigma model (1990’s)**

Six sigma model is a process improvement methodology that concern on eliminating damage or disability
by reducing variable. Six sigma was developed by Motorola company in 1990’s and also widely adopted by other companies deployed as business strategy in organization. The Six Sigma has similar steps to continue quality improvement models, steps of Six Sigma including define, measure, analyze, improve and control (DMAIC). Characteristic of Six Sigma is a system-wide, data driven approach, a business strategy, concentration on customer needs, eliminating defect, identification of sources of variation for standardization, maintain the improvement, problem solving approach, and a powerful set of statistical tools.

Since 2000, a large number hospital used Six Sigma to improve everything from registration to patient safety and appropriate to reducing medical error. The Six Sigma is designed to improve quality performance, increase patient satisfaction and lower costs [19]. A case study in improving the safety of anticoagulant use at memorial hospital, show that increase 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 [20].

According to Lanham & Maxson-Cooper [18], implementing six sigma in healthcare have been on reducing error and enhancing patient safety. The goal of apply six sigma in hospital is to reducing error reporting and relieve a blame-free culture. Six Sigma very powerful, support by data driven and high effort to reduce error and enhance patient safety in healthcare system.

3. Healthcare failure mode effect analysis (HFMEA)

Long time ago, the engineering community has used the Failure Mode and Effect Analysis (FMEA) model to look for potential failures and address them prior to actual failures [21]. Furthermore 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[22]. 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 [23].

The goal of HFMEA is to prevent errors by tried to identifying 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 [24]. For Patient Safety HFMEA 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 substep 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 of 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 [24].

The literature indicated many hospital in US use HFMEA approach to decrease of near-miss and adverse events, study of [25] team of Patient Safety and Adverse Events Team in teaching hospitals in Canada purported 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 dialysate 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) 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 many step analysis of potassium ordering and administration, Before the dialysate manufacturing error occurred, intravenous potassium vials were stored on the regular drug shelves within the pharmacy department. Furthermore to break the chain of errors that have occurred, PSAT was changing preparation, manufacturing, labelling and storage procedures for intravenous potassium products, and finally the risk of error has been substantially reduced.

4. Root cause analysis

An 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 [24]. Root Cause Analysis Framework is designed as a quality improvement tool to help individuals and organizations determine all of the contributing factors and root causes that led to an event. It also provides strategies for developing effective recommendations and implementing actions for system improvement [26].

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 [27]. In additional, 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 [28].

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 [29].
IV. CONCLUSION

Learning patient safety including popular word in patient safety such as error, adverse event, and near misses is significant effort for improving patient safety in healthcare. Information in nursing-related patient safety events will help nursing administrators to better manage patient safety in hospital. Based on the several study above, the writer conclude that patient safety is minimize the error, reduce the injury and harm, continually working toward the avoidance adverse event, control management treatment of unsafe acts and reporting incident in nursing care system. In the other hand Patient safety is decrease rate of adverse event unintended and discharge at the time.

In addition, the model of patient safety will provides general information about adverse event in hospital, model of patient safety can be varied in different hospital. Every hospital needs to use a proper combination and selection of model in their implementation process. Model are properly selected according to the need and demands of the situation and further applied correctly to the appropriate process and approach in patient safety.

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