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Development and Acceptability of the E-Nurse Patient Safety System Towards Technology Management

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ABSTRACT

Purpose: The study aimed to develop an e-nurse patient safety management system and determine its acceptability among staff nurses in a private hospital in Cebu towards technology management.

Method: A descriptive, quantitative approach was employed. Data were obtained from the fifty staff nurses in a private hospital in Cebu using the Hospital Survey on Patient Safety Culture by the Agency for Healthcare Research and Quality. In the development of the system design, technical requirements were embedded. Patient safety features were incorporated including safety policy, safety risk management, safety assurance and safety promotion. Finally, acceptability of the e-nurse patient safety management system was done using the Technology Acceptance Model (TAM).

Results: The study was analyzed using simple percentage and weighted mean. The study revealed significant findings highlighting that clinical leaders, managers, and supervisors promote patient safety and deal with patient safety issues reflecting a favorable perception from the staff nurses, and it showed that all hospital departments and sections have good teamwork. In addition, there is frequent practice and involvement in the workplace regarding nurse communication, reporting of incidents, and appreciative of organizational and managerial support for patient safety. The study's findings demonstrated a high level of user acceptance with the system.

Conclusion: One could legitimately conclude that the E-nurse Patient Safety Management System's acceptance serves as evidence of the soundness of the design process. The successful adoption suggests a well-designed system aligned with key patient safety culture dimensions. This highlights the critical need to consider existing safety culture when developing any patient safety management system.

Keywords: Development, acceptability, e-nurse patient safety system, technology management

INTRODUCTION

Patient safety is a healthcare discipline that arose in response to the increasing complexity of health-care systems and the associated increase in patient harm in hospitals (World Health Organization, 2019). In order to provide patients with the best possible treatment, it aims to prevent and reduce risks, mistakes, and patient harm. A fundamental principle of the discipline is continuous progress based on learning from mistakes and unfavorable situations (Vincent, 2011; World Health Organization, 2019). Patient safety is a requirement for providing vital health services of high quality. In fact, there is widespread consensus that high-quality healthcare must be efficient, secure, and focused on patients across the world (Vincent, 2011; Bhoi et al, 2019; World Health Organization, 2019).

Patient safety is an established cornerstone of healthcare quality (Kohn, 2000; Health Foundation London, 2013). As the discipline around safety has evolved and attracted political attention, patient safety has become recognised with international importance (National Academies of Sciences, 2019). According to the World Health Organization (2019), patient safety has been enshrined as a global health priority via a World Health

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

Assembly Resolution. The trajectory towards global importance has taken decades, but the case for safer care has been consistently strong.

Reiling, et al. (2003) assert that in order to design with patient safety as a guiding principle, the interaction between buildings, machinery, technology, and people must be taken into account at the outset of the design process. The analysis of the interactions between people, the equipment they use, and the environments where they live and work is known as human factors analysis. Employees interact with the workplaces, as well as the stationary and mobile equipment they use. A safer environment can be created for patients and employees by designing buildings, tools, and procedures with an understanding of human factors.

According to Battles (2002), understanding the root causes of error and spotting potential dangers is a top priority in patient safety research so that the proper preventive measures may be put in place. The Institute of Medicine (IOM) report emphasized the value of using technology to automate routine, time-consuming, and error-prone procedures. The patient safety movement has made extensive use of technology to eradicate skill- and rule-based human error. Rule-based conduct entails using existing convention, policy, or schemes to manage known situations, while skill-based behavior refers to "automatic" actions requiring little to no conscious attention during execution.

Patient safety is a fundamental element of health care and is regarded as an essential component for improving health outcomes. The provision of safe and quality health service that is responsive to the needs of the people is a vital pillar in helping achieve Universal Health Care. The Department of Health (DOH) issued AO No. 2008-0023 to institutionalize quality assurance where patient safety is regarded as one of the key dimensions of quality health care. Correspondingly, the Patient Safety Program was implemented to provide a framework for quality and safe health services in all DOH hospitals and other health facilities (Department of Health, 2008).

The World Health Assembly (WHA) on Patient Safety issued a challenge to all health systems to acknowledge the need of promoting patient safety as a core value. Along with this global call, former Secretary of the Department of Health (DOH) Francisco T. Duque issued a memorandum on July 30, 2008, under Administrative Order No. 2008-0023, titled "National Policy for Patient Safety." As a response, the government is under constant pressure to strengthen and institutionalize a culture in which patient safety is seen as one of the most important aspects of providing high-quality care. Institutionalization of patient safety programs, as well as monitoring and assessment procedures, were emphasized. In accordance with AO 2008-0023, a number of organizations, including the Philippine Alliance for Patient Safety, Joint Commission International (Center for Patient Safety) and the Department of Health (DOH) committed to promote patient safety programs. Patient safety strategies have been implemented in many healthcare organizations, according to the findings. However, records alone are insufficient to reveal the country's actual score when it comes to valuing patient safety.

In The Philippines, the health system is a complex, multi-layered system in which responsibilities in the health care sector are fragmented. Responsibility is shared between the central government (the Department of Health), and Local Government Units that have full autonomy to organize and finance their own regional systems. The Department of Health develops and approves state quality standards and clinical protocols, and is responsible for the organization and implementation of the mandatory accreditation of health care facilities and the issuing of licenses. Local Government Units such as provincial governments are tasked with providing primary and secondary hospital care, while city and municipal governments are tasked with providing primary health care, promotive and preventive health programs and basic ambulatory clinical care (Orange Health Consultants, 2021).

The importance of information technology in minimizing medical errors, according to Kimmel and Sensmeier (2002), is a recurring topic throughout all Institute of Medicine papers. Information is the core issue with medical error reduction. Creating systems for gathering, analyzing, and using current information will help to reduce the frequency of medical errors. In order to lower medical errors and boost productivity, the Healthcare

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

Information and Management Systems Society (HIMSS) is promoting the use of information technology, particularly point-of-care, unit-of-use bar coding.

While it is undeniable that technologies must be designed to be usable, that is, simple to use, and useful, that is, will increase work performance, efficiency, and/or quality, it is also undeniable that design does not stop after usability and usefulness are taken care of. For technology to be used effectively, an organization's technology implementation process must be properly planned. Studies of technology acceptance and adoption in healthcare are starting to appear in the literature, which is an indication that the value of implementation is growing (Karsh, 2004).

The main purpose of the study is to continuously enhance patient safety and incorporating technology in the implementation of strategies in order to avoid preventable errors. It will provide a framework for organizations to work within as they expand, grow, and ensure the quality of their care and services in order to meet the needs of patients. The study's conclusions will be applied to the creation of an e-nurse patient safety system that incorporates all procedures for monitoring, assessing, and evaluating patient care quality. With the aim of raising the caliber and patient safety to the highest possible level, it will develop a methodical strategy to ensure clinical service accountability. On the other hand, managers and supervisors may be able to recognize and understand the present situation of the hospital's safety culture. It could raise nurses' knowledge of patient safety and contribute to better patient care.

METHOD

Participants

Data were obtained from the staff nurses in a private hospital in Cebu. A total of fifty respondents was included in the study. This study utilized a complete enumeration of the population. All participants completed and signed a consent form indicated their consent to participate in the study. Participants were assured of anonymity by the consent form being detached from the questionnaires. Any questionnaires returned without consent forms were not included for data entry. However, all questionnaires were retrieved.

The study used the descriptive design utilizing quantitative approach. This research utilized a standard tool entitled Hospital Survey on Patient Safety Culture by the Agency for Healthcare Research and Quality. Simple percentage and weighted mean was used to treat the data.

Population

The study covered all staff nurses currently working in a private hospital in Cebu. A total of fifty respondents was included in the study which utilized a complete enumeration of the population.

Measurement

The study utilized a standard tool entitled Hospital Survey on Patient Safety Culture by the Agency for Healthcare Research and Quality (2019) to measure the hospital’s patient safety management of the staff nurses. The questionnaire includes questions related to work area or unit, supervisor or manager, communication, reporting of events and hospital and is composed of 32 statements/indicators wherein the staff nurses will be asked to put a check mark on their best answer. It is a 5-point likert scale wherein 5 – strongly agree, 4 – agree, 3 – neither, 2 – disagree and 1 – strongly disagree. It also uses another 5-point likert scaling wherein 5 – always, 4 – often, 3 – sometimes, 2 – rarely and 1 – never. Planning, designing and developing of the e-nurse patient safety management system was done. Technical requirements and patient safety features was identified to develop the management system. The development of the patient safety management system followed. The e-nurse patient safety management system was presented and demonstrated to the staff nurses. All of the staff nurses was given time to use the e-nurse patient safety management system. Technology acceptability was also conducted to assess the usefulness and ease of use of the system. The study adopted the Technology Acceptance Model (Davis, 1989), a standard instrument which is composed of two areas: the

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

perceived usefulness and perceived ease of use. The e-nurse patient safety management system was evaluated using this test to gauge staff nurses' technology acceptability. Both the two areas of the 5-point likert tool is composed of 6 statements/indicators. The staff nurses are asked to check appropriately the number that most reflect the frequency of the statements.

Analysis

The quantitative data was analysed using IBM SPSS Statistics software, version 29. The weighted mean was utilized to determine the hospital's patient safety culture related to work area or unit, supervisor or manager, communication, reporting of events and the hospital. It was also used to test the level of acceptability of the e-nurse patient safety management system in terms of its perceived usefulness and perceived ease of use. The weighted categories of the average points was used as the mean item evaluated. Assessment scale was utilized to provide response of the respondent's level of perception to the hospital's patient safety culture. Moreover, assessment scale was utilized to test the acceptability of the e-nurse patient safety management system using Technology Acceptance Model (TAM).

RESULTS

The Hospital's Patient Safety Culture

This refers to patient safety culture related to work area, supervisor, communication, reporting of events and the hospital. These profiles can probably affect the hospital's patient safety.

Table 1 presents the mean score of patient safety culture related to the work area or unit.

Hospital Work Area or Unit	AVERAGE	INTERPRETATION
1. People support one another in this unit.	4.16	Positive
2. We have enough staff to handle the workload.	2.83	Neither
When a lot of work needs to be done quickly, we work together as a team to get the work done.	4.04	Positive
4. In this unit, people treat each other with respect.	4.04	Positive
5. Staff in this unit work longer hours than is best for patient care.	3.83	Positive
6. We are actively doing things to improve patient safety.	3.88	Positive
. We use more agency/temporary staff that is best for patient care.	3.29	Neither
8. Staff feel like their mistakes are held against them.	3.58	Positive
9. Mistakes have led to positive changes here.	3.83	Positive
. It is just by chance that more serious mistakes don't happen around here.	3.50	Positive
11. When one area in this unit gets really busy, others help out.	3.67	Positive
2. When an event is reported, it feels like the person is being written up, not the problem.	3.58	Positive

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

. After we make changes to improve patient safety, we evaluate their effectiveness.	3.67	Positive
14. We work in "crisis mode" trying to do too much, too quickly.	3.54	Positive
15. Patient safety is never sacrificed to get more work done.	3.75	Positive
. Staff worry that mistakes they make are kept in their personnel file.	3.92	Positive
17. We have patient safety problems in this unit.	3.46	Positive
18. Our procedures and systems are good at preventing errors from happening.	3.38	Neither
19. Mean Score	3.66	Positive

Table 1 reveals the mean score of patient safety management related to the work area or unit. It garnered an overall mean score of 3.66 interpreted as positive perception. Of the 18 indicators, “People support one another in this unit.” got the highest mean score of 4.16 interpreted as positive perception. It is followed by another 2 indicators with high mean score of 4.04, “When a lot of work needs to be done quickly, we work together as a team to get the work done”, and “In this unit, people treat each other with respect”. This implied that the nurses' teamwork is strong across all hospital departments and units. The staff nurses respect one another, work well as a team, and assist one another when needed. On the other hand, the indicator that got the lowest mean score of 2.83 is “We have enough staff to handle the workload” followed by the mean score of 3.29, “We use more agency/temporary staff that is best for patient care”. This implied that a hospital's staffing situation, including absences, tardiness, resignations, turnover of nurses, has a significant impact on and affects the nurses' day-to-day work.

Supervisor or Manager

This refers to the patient safety culture of the immediate supervisor or manager to whom the nurses report.

Table 2 presents the mean score of patient safety culture related to the supervisor or manager.

Supervisor or Manager	**AVERAGE**	**INTERPRETATION**
. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures.	4.08	Positive
. My supervisor/manager seriously considers staff suggestions for improving patient safety.	4.08	Positive
Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts.	2.79	Neither
4. My supervisor/manager overlooks patient safety problems that happen over and over.	3.54	Positive
5. **Mean Score**	**3.62**	**Positive**

Table 2 illustrates the mean score of patient safety management related to the supervisor or manager. It accumulated an overall mean score of 3.62 interpreted as positive perception. Of the 4 indicators, “My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures” and “My supervisor/manager seriously considers staff suggestions for improving patient safety”

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

hot the highest mean of 4.08 interpreted as positive perception. Inferred from this was that clinical leaders, managers, and supervisors support patient safety and address patient safety issues. Additionally, it means that ideas made by the staff to enhance patient safety are taken into account. Whereas, the indicator that got the lowest mean score of 2.79 is "whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts". This implied that managers and supervisors, particularly in emergency situations and unusual conditions, consider a quicker turnaround time of work and task for nurses.

COMMUNICATION

Lack of communication is a major risk factor that leads to a bad patient experience and has an impact on both patient safety and clinical outcomes.

Table 3 presents the mean score of patient safety culture related to communication.

Communication	AVERAGE	INTERPRETATION
We are given feedback about changes put into place based on event reports.	3.79	Often
Staff will freely speak up if they see something that may negatively affect patient care.	3.66	Often
3. We are informed about errors that happen in this unit.	4.13	Often
Staff feel free to question the decisions or actions of those with more authority.	3.63	Often
In this unit, we discuss ways to prevent errors from happening again.	3.88	Often
6. Staff are afraid to ask questions when something does not seem right.	3.33	Sometimes
7. Mean Score	3.74	Often

Table 3 conveys the mean score of patient safety management related to communication. It attained an overall mean score of 3.74 interpreted as often occurrences. Of the 6 indicators, "we are informed about errors that happen in this unit" got the highest mean score of 4.13 interpreted as often occurrences. It is followed by a mean score of 3.88 which is "in this unit, we discuss ways to prevent errors from happening again". This implied that improving patient safety requires open communication to a greater extent. When there are any concerns about the patient's safety, it is indeed crucial to speak up to stop errors. Furthermore, the indicator that got the lowest mean score of 3.33 is "staff are afraid to ask questions when something does not seem right". This implied that nurses, particularly those with less experience, lack the assertiveness to voice concerns and query any discrepancies. The nurse may be prevented from speaking up by the ongoing seniority culture at work.

Reporting of Events

The frequency with which mistakes are reported in the hospital work area or unit is referred to as event reporting. The reporting systems in healthcare enable safety specialists to assess incidents, identify underlying reasons, and provide actionable knowledge to decrease risks by gathering adverse events and near misses.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

Table 4 presents the mean score of patient safety culture related to reporting of events.

Frequency of Events Reported	AVERAGE	INTERPRETATION
1. When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?	3.91	Often
When a mistake is made, but has no potential to harm the patient, how often is this reported?	3.63	Often
When a mistake is made that could harm the patient, but does not, how often is this reported?	3.50	Often
4. Mean Score	3.68	Often

Table 4 exhibits the mean score of patient safety management related to reporting of events. It acquired an overall mean score of 3.68 interpreted as often in occurrences. Of the 3 indicators, “when a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?” got the highest mean score of 3.91 interpreted as often. It is followed by a mean score of 3.61 which is “when a mistake is made, but has no potential to harm the patient, how often is this reported?” In addition, the indicator that got the lowest mean score of 3.50 is “when a mistake is made that could harm the patient, but does not, how often is this reported?” This implied that nurses are proactive and outspoken when they disclose any inconsistencies or irregularities in the workplace or unit. Additionally, it indicates that nurses appreciate their responsibility and accountability, and are aware of any potential repercussions of their actions. Moreover, the culture surrounding patient safety does not fully embrace near misses.

Hospital

This denotes the patient safety culture of the hospital as whole as perceived by the staff nurses. The practice of safety management is dynamic and ever-evolving. In order to obtain the desired results, the process must be continuously assessed and modified.

Table 5 presents the mean score of patient safety management related to the hospital. It garnered an overall mean score of 3.48 interpreted as positive perception. Of the 11 indicators, “the actions of hospital management show that patient safety is a top priority” got the highest mean score of 4.08 interpreted as positive perception. It is followed by a mean score of 3.92 which is “hospital management provides a work climate that promotes patient safety”. As a result, it was inferred that an important aspect of patient safety is organizational support. Nursing staff members are impacted by and grateful for the management's patient safety initiatives and programs. The provision of safe care is influenced by teamwork and a positive work environment. On the other hand, the lowest mean score 2.92 which is “things “fall between the cracks” when transferring patients from one unit to another”, followed by “shift changes are problematic for patients in this hospital” and “it is often unpleasant to work with staff from other hospital units” with mean scores of 3.03 and 3.21 respectively. This showed that neither a favorable nor a negative view of nurses is affected by the circumstances in the hospital. This demonstrates the flexibility and adaptability of nurses to any situation that may arise. Further, this shows that nurses are resilient.

Table 5 presents the mean score of patient safety culture related to the hospital.

Hospital	AVERAGE	INTERPRETATION
1. Hospital management provides a work climate that promotes patient safety.	3.92	Positive

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

2. Hospital units do not coordinate well with each other.	3.38	Neither
. Things "fall between the cracks" when transferring patients from one unit to another.	2.92	Neither
There is good cooperation among hospital units that need to work together.	3.67	Positive
5. Important patient care information is often lost during shift changes.	3.38	Neither
. It is often unpleasant to work with staff from other hospital units.	3.21	Neither
7. Problems often occur in the exchange of information across hospital units.	3.29	Neither
. The actions of hospital management show that patient safety is a top priority.	4.08	Positive
Hospital management seems interested in patient safety only after an adverse event happens.	3.50	Positive
10. Hospital units work well together to provide the best care for patients.	3.88	Positive
11. Shift changes are problematic for patients in this hospital.	3.08	Neither
12. **Mean Score**	**3.48**	**Positive**

The Design of the E-nurse Patient Safety Management System

A methodical approach to controlling safety is offered by a patient safety management system. The proper organizational structures, accountabilities, responsibilities, policies, and procedures must exist for a design to be effective. Additionally, it is a program for encouraging safety, lowering risk, and preventing mistakes made by nurses while at work. Hospitals use it to recognize, evaluate, and manage risks to staff nurses across the spectrum of nursing operations. The process of identifying and reducing safety risks via sound design during the conceptual and planning phases of a management system is known as the design of the e-nurse patient safety management system. The technological specifications and patient safety features are the main considerations in the development of the e-nurse patient safety management system.

Technical Requirements

Technical requirements are the variables needed to offer a desired function from a patient safety management system in order to meet the hospital's patient safety standards, minimize errors and mitigate hazards or risks. According to Allen (2013), several hospitals that implemented ISO 9001 reported either a good or no impact on patient safety. The implementation of each technical requirement of the quality management system has been shown to improve patient safety. Other norms, methods, and quality requirements could also help to ensure patient safety.

Technical Specification

The e-nurse patient safety management system used a number of technical requirements. Its operating system is Web Systems, which also runs on Mac OS and Windows. Additionally, Apache is the server that it employs. Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge are among the operating systems that the

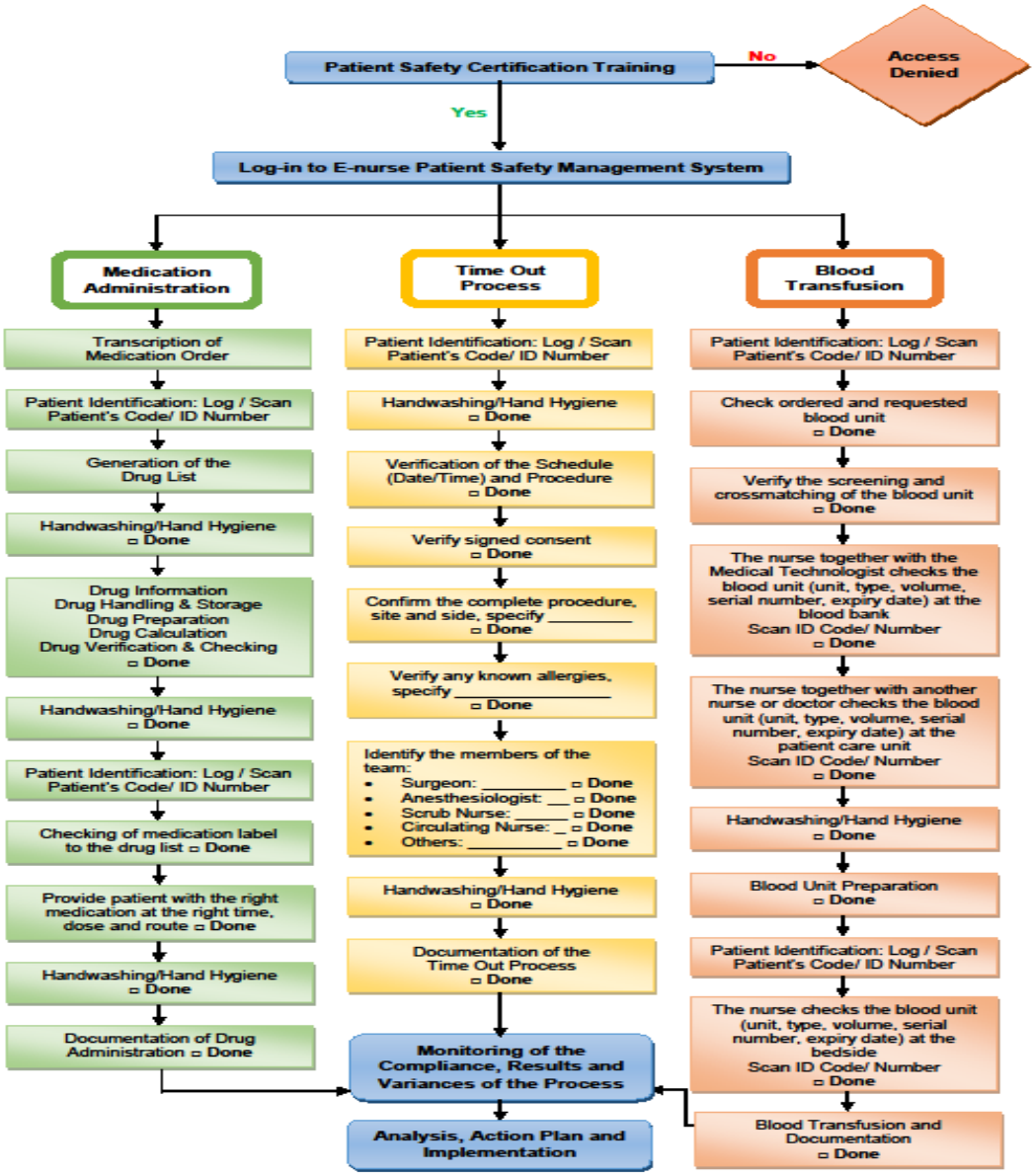
ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

management system runs on. The program's MySQL is Phpmyadmin 8.0. PHP serves as a programming language. The Codeigniter is used as the framework, to finish.

Design

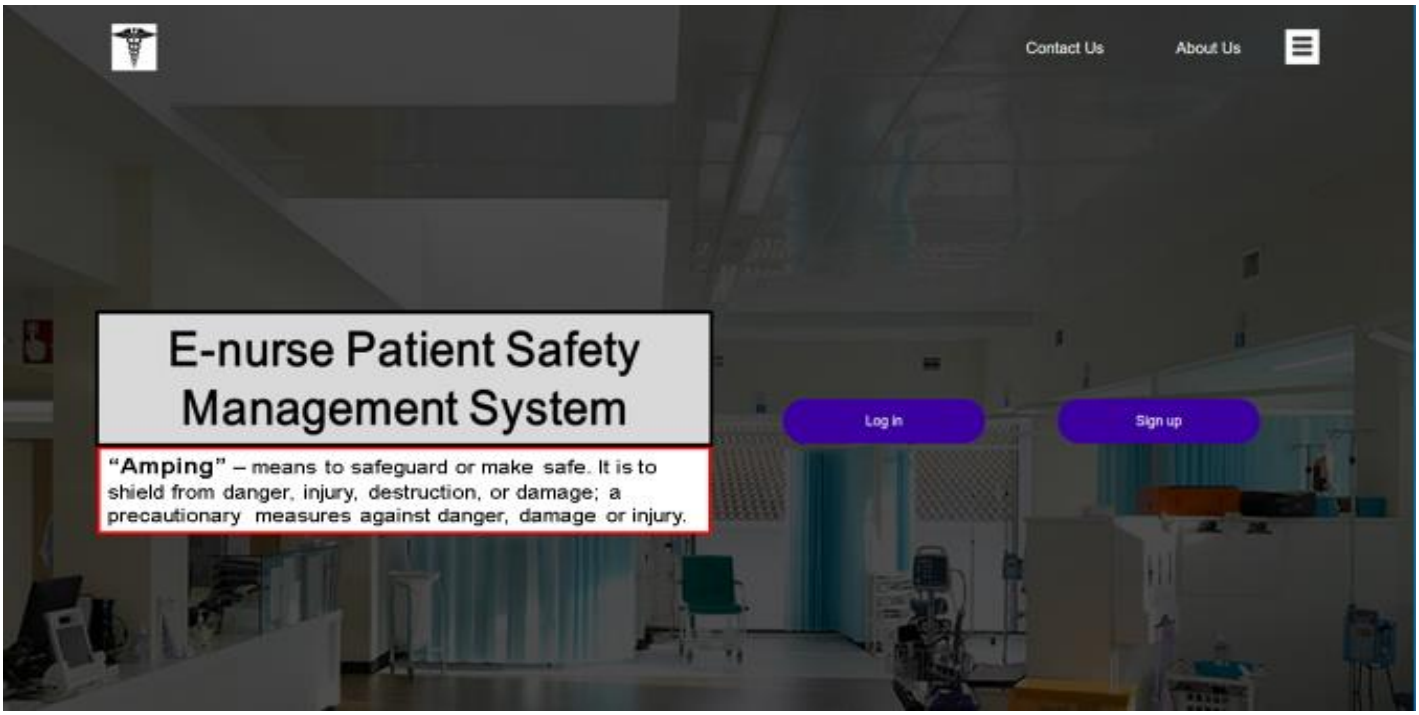
The classification of E-Nurse Patient Safety Management System is running on a web server – client services. The design of the User-interface (UI) and User-experience (UE) has three section pages on the main page. The admin page has the control dashboard wherein statistical reports are embedded and a list of reports. There are 3 main buttons on the User Interface which are blood transfusion, time-out process and medication administration.

As shown below, Figure 1 illustrates the e-nurse patient safety management system's design process.



ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

Figure 2 shows the actual screenshot of the e-nurse patient safety management system.



Patient Safety Features

The management system's patient safety features are a group of organized processes that enable efficient risk-based decision-making for routine patient safety tasks. Its purpose is to offer a method for addressing safety concerns in patient care. It supports hospitals in maintaining safe care delivery and providing services at the greatest degree of safety. Additionally, it can be used as a formal way to fulfill the Department of Health's statutory provisions.

The e-nurse patient safety management system's patient safety features are concentrated on the following areas: safety policy, safety risk management, safety assurance, and safety promotion.

The Level of Acceptability of the E-nurse Patient Safety Management System

The acceptability of the e-nurse patient safety management system by hospital staff nurses was examined in this study. Acceptability refers to determining how well an intervention will be received by the target population and how effectively the new intervention or its components may fit the needs of the target population and organizational setting (Ayala & Elder, 2011).

The "degree to which an individual believes that employing a certain system would improve his or her job performance" was described as perceived usefulness (Davis, 1993). The "degree to which an individual believes that using a certain technology will be free of physical and mental effort" was characterized as perceived ease of use (Davis, 1993). It was argued that these two characteristics shaped the user's attitude about utilizing the system, which influenced real system utilization. Thus, the more the perceived simplicity of use and utility of the system, the greater the likelihood of actually using the system (Henderson & Divett, 2003).

Perceived Usefulness

This denotes the degree to which the staff nurses believes that employing the e-nurse patient safety management system would improve patient safety in the hospital.

Table 6 presents the mean score of perceived usefulness.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

Indicator	AVERAGE	INTERPRETATION
1. Using the e-nurse patient safety management system in my job would enable me to accomplish tasks more quickly.	4.58	Highly Acceptable
2. Using the e-nurse patient safety management system would improve my job performance.	4.63	Highly Acceptable
3. Using the e-nurse patient safety management system in my job would increase my productivity.	4.63	Highly Acceptable
4. Using the e-nurse patient safety management system would enhance my effectiveness on the job.	4.66	Highly Acceptable
Using the e-nurse patient safety management system would make it easier to do my job.	4.58	Highly Acceptable
I would find the e-nurse patient safety management system useful in my job.	4.63	Highly Acceptable
7. Mean Score	4.62	Highly Acceptable

Table 6 presents the level of perceived usefulness of the e-nurse patient safety management system. It accumulated an overall mean score of 4.62 interpreted as highly acceptable. Of the 6 indicators, “using the e-nurse patient safety management system would enhance my effectiveness on the job” got the highest mean score of 4.66 interpreted as highly acceptable. The 3 other indicators got a mean score of 4.63 and the remaining 2 indicators got the mean score of 4.58 which all are interpreted as highly acceptable. This suggested that the e-nurse patient safety management system is helpful in the nursing practice to increase the efficiency and effectiveness of the delivery of care. Additionally, it suggested that nurses could easily adapt to new technological developments that would enhance their field of nursing.

Perceived Ease of Use

This refers to the degree to which an individual believes that using a certain technology will be free of physical and mental effort.

Table 7 presents the mean score of perceived ease of use.

Indicator	AVERAGE	INTERPRETATION
Learning to operate the e-nurse patient safety management system would be easy for me.	4.46	Highly Acceptable
. I would find it easy to get the e-nurse patient safety management system to do what I want it to do.	4.62	Highly Acceptable
My interaction with the e-nurse patient safety management system would be clear and understandable.	4.50	Highly Acceptable
I would find the e-nurse patient safety management system would be clear and understandable.	4.62	Highly Acceptable

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

5. It would be easy for me to become skillful at using the e-nurse patient safety management system.	4.46	Highly Acceptable
I would find the e-nurse patient safety management system easy to use.	4.62	Highly Acceptable
7. **Mean Score**	**4.55**	**Highly Acceptable**

Table 7 presents the level of perceived ease of use of the e-nurse patient safety management system. It accumulated an overall mean score of 4.55 interpreted as highly acceptable. 3 out of 6 indicators got the highest score of 4.62 interpreted as highly acceptable. This includes “I would find it easy to get the e-nurse patient safety management system to do what I want it to do”, “I would find the e-nurse patient safety management system would be clear and understandable’, and “I would find the e-nurse patient safety management system easy to use”. The other 2 indicators got the lowest score of 4.46 interpreted as highly acceptable. All indicators reflect highly acceptable as to ease of use. This meant that nurses today are technologically savvy and computer educated, making them flexible to any technology-based improvements in practice.

DISCUSSION

The study's findings showed that that clinical leaders, managers, and supervisors promote patient safety and deal with patient safety issues reflects a favorable perception from the staff nurses, and it also revealed a positive perception of the unit's patient safety management. This implied that the nurses' teamwork is strong across all hospital departments and units. The staff nurses respect one another, work well as a team, and assist one another when needed. Furthermore, this implied that a hospital's staffing situation, including absences, tardiness, resignations, turnover of nurses, has a significant impact on and affects the nurses' day-to-day work. Additionally, inferred from the findings was that clinical leaders, managers, and supervisors support patient safety and address patient safety issues. It means that ideas made by the staff to enhance patient safety are taken into account. Moreover, this implied that managers and supervisors, particularly in emergency situations and unusual conditions, consider a quicker turnaround time of work and task for nurses.

The study also showed that all hospital departments and sections have good teamwork. This implied that improving patient safety requires open communication to a greater extent. When there are any concerns about the patient's safety, it is indeed crucial to speak up to stop errors. Moreover, his implied that nurses, particularly those with less experience, lack the assertiveness to voice concerns and query any discrepancies. The nurse may be prevented from speaking up by the ongoing seniority culture at work. In addition, there is frequent practice and involvement in the workplace regarding nurse communication and reporting of incidents. This implied that nurses are proactive and outspoken when they disclose any inconsistencies or irregularities in the workplace or unit. Additionally, it indicates that nurses appreciate their responsibility and accountability, and are aware of any potential repercussions of their actions. Moreover, the culture surrounding patient safety does not fully embrace near misses. The nurses are also appreciative of organizational and managerial support for patient safety. Furthermore, it was inferred that an important aspect of patient safety is organizational support. Nursing staff members are impacted by and grateful for the management's patient safety initiatives and programs. The provision of safe care is influenced by teamwork and a positive work environment. The findings further demonstrates the flexibility and adaptability of nurses to any situation that may arise. This shows that nurses are resilient.

According to the study’s result, a safety management system's design, which takes into account both technical specifications and patient safety aspects, is crucial to the system's performance. The staff nurses’ acceptability to the e-nurse patient safety management system showed a high level of acceptance, in summary. This suggested that the system is helpful in the nursing practice to increase the efficiency and effectiveness of the delivery of care. Additionally, it revealed that nurses could easily adapt to new technological developments that would enhance their field of nursing. Moreover, all indicators reflect highly acceptable as to ease of use.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XII Issue VIII August 2025

This meant that nurses today are technologically savvy and computer educated, making them flexible to any technology-based improvements in practice.

CONCLUSION

The study's findings, which were summarized in the staff nurses' acceptability of the E-nurse Patient Safety Management System, demonstrated a high level of user acceptance with the system. One could legitimately conclude that the successful design process and development of a safety management system, such as the E-nurse Patient Safety Management System, suggests a well-designed system aligned with key patient safety culture dimensions. This highlights the critical need to consider existing safety culture when developing any patient safety management system. It is recommended that hospitals adopt the e-nurse patient safety management system to enhance patient safety, control risks, and prevent errors or any unfavorable events. The evaluation of the effectiveness of the system's use among the nurses should also be assessed. Finally, it is suggested that the system be monitored for further modification and improvement of its functions and usability.

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