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Harnessing Technology to Elevate Nursing Performance: A Strategic Approach for the Philippines

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ABSTRACT

This paper examines the impact of technology on nursing performance, specifically how technology can be incorporated into performance management in nursing. The research focuses on integrating Electronic Health Records (EHR), telehealth, mobile health applications (mHealth), and patient monitoring systems within the Philippine nursing environment. The study explores the association between the diffusion of these technology-enhanced healthcare tools and performance results through mixed methods—quantitative questionnaires and qualitative interviews. Participants included Bachelor of Nursing (BN) and Registered Nursing (RN) professionals with varying years of experience in different healthcare settings. Results indicate that EHR and telehealth are widely adopted and enhance the effectiveness of nursing practice. However, barriers such as inadequate training, poor implementation, and resistance to change hinder full integration into daily nursing routines. The study emphasizes that increasing the adoption of technological tools requires continuous training, leadership support, and strategic planning to overcome barriers. In conclusion, this paper underscores the importance of strategic planning in implementing technology within nursing to enable financial, technical, and professional readiness for change.

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INTRODUCTION

Nursing performance is one of the most important factors that define the quality of healthcare services. Nurses are part of the health care teams directly caring for patients; their performance impacts patient, organizational, and system outcomes. For this reason, evaluating the performance of the nursing staff is crucial to improve service delivery and enhance the quality of care to the patients.

For instance, McBride and Miller (2018) emphasize that integrating health IT systems, particularly electronic health records, can significantly enhance nursing documentation, reduce errors, and improve workflow efficiency. A number of studies have shown the correlation between the quality of delivered nursing care and patient satisfaction, fewer readmissions, and improved clinical outcomes (Blegen et al., 2013). Furthermore, nursing practice plays an essential role in the prevention and intervention of HAIs, patient education in their health status, and overall nursing care that goes a long way in helping the patient recover (Aiken et al., 2011).

Due to these new dynamics in health care organizations and patients, there is a growing need to enhance the performance of nursing personnel. The health care environment constantly faces changes because of changing treatments, regulations, environmental factors, or patient demographics. Technology has a significant function in this process, as it offers new approaches and instruments for improving the quality of nursing practices. From the EHRs to telemedicine and mobile health applications, the technology has revolutionized the delivery and management of healthcare services (Greenhalgh et al., 2017). The impact of technology in nursing practice is not only a fad but a necessity in handling current issues and future advancements in managing health care systems (Moorhead et al., 2013).

The challenges include a lack of empirical evidence and gaps in financing, policies, workforce, practices, leadership, integrity, technology, information, and education. The setting of the Philippines' healthcare environment is described by an acute deficiency of nurses, congested service delivery, and a dearth of the necessary amenities in distant and deserted regions (Dela Cruz & Rosario, 2015). Furthermore, while other countries have advanced in the use of technologies in the healthcare sector, the Philippine nursing workforce has not been able to incorporate the technologies effectively. The problem is that many healthcare institutions in the Philippines are poorly equipped, provide few opportunities for training, and are slow to adopt new technology, which hampers improving nursing performance through technology (Santos, 2016). Therefore, it is necessary to develop a planning approach to help nurses utilize the technology resources best to enhance their performance and, thus, improve care delivery to patients.

Problem Statement

Integrating technology into nursing practice has proven effective for enhancing patient care and nursing performance (Finkelman & Kenner, 2016). However, many promising technologies, including Electronic Health Records (EHR), Telehealth, and mobile health (mHealth) applications, remain

underutilized in the Philippines due to persistent barriers such as inadequate training, poor implementation strategies, and resistance to change (O'Connor et al., 2019). These gaps hinder the optimization of nursing workflows and limit the potential for technology to enhance care delivery.

The Philippine healthcare sector struggles with strategic technology integration despite global advancements due to resource scarcity, population growth, and infrastructural limitations. Existing literature largely overlooks how technology can be systematically embedded into the strategic planning of healthcare organizations. When integration is uncoordinated, implementations are fragmented, and staff often resist adoption, negating potential efficiencies. This study addresses the critical need for clear, practical strategies to effectively integrate technology into nursing practice, ultimately boosting performance management and patient outcomes.

FRAMEWORK

To understand the adoption and impact of technology in nursing, this study is grounded in key theoretical models:

Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT): These models explore how perceived usefulness and ease of use influence technology adoption among nurses (Davis, 1989; Venkatesh et al., 2003).

Performance Management Theories: The Balanced Scorecard (Kaplan & Norton, 1996) and Goal Setting Theory (Locke & Latham, 2002) emphasize aligning technology with organizational goals to enhance nursing performance.

Nursing Informatics Frameworks: Models such as the Staggers & Thompson Nursing Informatics Model provide structured approaches for evaluating the implementation and impact of technology in clinical settings (Staggers & Thompson, 2002).

These frameworks collectively guide this study's exploration of technology-enhanced performance management in Philippine nursing practice.

Performance Management Theories

The performance management theories in healthcare are based on organizational theories and focus on continuous measurements, assessment, and enhancement of nursing performance (Fletcher, 2001). As Kaplan and Norton (1996) have noted, the Balanced Scorecard (BSC) is one of the most prominent performance management models. The BSC, therefore, encompasses financial and non-financial measures to measure the performance of healthcare organizations,

such as patient satisfaction, quality of services, and nursing effectiveness, among others. This model postulates a need to align the strategies, the process, the people, and the technologies towards enhancing performance. By implementing the BSC approach, it is possible that overall nursing performance in healthcare organizations can be well coordinated and consistent with the overall corporate strategic management plans.

Another theory is Goal Setting Theory by Locke and Latham (2002), which also connects with performance management in nursing. One of the key reasons for this is that this theory focuses on goal clarity and quantifiable goals for performance enhancement. Clear performance goals, which may include shortening of patients' waiting time, better communication, and patient safety in clinical settings, can be set through technology in the nursing practice. When goals developed by the nurses are specific and quantifiable with the help of technology, it can better facilitate the staff to achieve the performance and results that are being expected from them, leading to better patient outcomes (Locke & Latham, 2002).

Technology Acceptance Models

The Technology Acceptance Model (TAM) is a well-established model for studying how people accept or adopt innovative Information Technologies. Davis argued that PEOU and PU are two factors that support the proposition of TAM for adopting a new technology. In the context of nursing, TAM assists in understanding how and why nurses use it or not, in the case of EHR systems, telemedicine, and mobile applications. Nurses' fears toward technology are reduced when they are convinced that it optimizes efficiency, benefits the patients, and is not difficult for the staff to utilize. Furthermore, Venkatesh et al. (2003) Unified Theory of Acceptance and Use of Technology extends the TAM model. It introduces perceived social influence and facilitating conditions as other factors affecting healthcare usage. These models facilitate the determination of the factors that hinder or facilitate the use of technology while at the same time guiding the development of plans for implementing the technology in the practice of nursing.

Current Trends in Nursing Technology

Nursing Technology has drastically shifted in its delivery, positively affecting care delivery, precision, and patients. With the increasing usage of digital health tools, nurses can amend the latter, organize communication, and manage patients more effectively. The flows are some of the most prominent technological advancements playing a significant role in modern nursing practice.

Telehealth

Telehealth, providing medical care through telecommunication technology, has been one of the most innovative innovations in nursing care. Telehealth allows nurses to practice from a distance, especially in rural and other hard-to-reach locations that have a poor health facility ratio (Bashshur et al., 2016). According to Kruse et al. (2017), studies on the impact of telehealth in nursing practice have indicated enhanced patient satisfaction, health literacy, chronic disease management, and healthcare utilisation. Nurses may use telemedicine for remote consultation, assessment of vital signs, and counseling, thus lowering hospital interactions and costs.

Telehealth has increasingly become popular, especially in the Philippines, amid the COVID-19 pandemic. Nurses have used technology to engage in follow-up consultations and to offer mental health and health advice for patients under isolation. As highlighted by Gearing et al. (2020), the Philippines' quick integration of this technique enabled nurses to implement telehealth in caring for their patients while reducing the dissemination of the virus. The study noted that telehealth possessed significant potential in Malaysia but required more infrastructure development and proper training.

Electronic Health Records (EHR)

Another area that has been influenced by technology is electronic health records, also known as EHR. Electronic health records systems help nurses document patient records electronically, thereby enhancing the capture of comprehensive patient information and sharing patient information across team members (Bates et al., 2014). EHRs have been known to have contributed to decreased medication errors, improved patient safety, and better-coordinated care (Ash et al., 2004). It is comfortable inputting data instead of writing, improves practice quality (work life), increases practice productivity (patients per day), and reduces workload (Lo Ang et al., 2024). When implemented and used by the nurses, EHR systems have contributed to better and efficient practice, such as accurate and timely care and continuity of care.

The implementation of EHRs in the Philippines remains low because of the barriers of physical structure, including irregular Internet connectivity and deficient training (Castillo et al., 2019). There have been a few positive implementations, such as the Philippine Health Information Exchange, which facilitates the sharing of patients' data electronically among institutions. In a study conducted by Punzalan and Geronimo in 2019, it was revealed that the PHIE positively impacted the coordination of care and the elimination of

excessive testing, which boosted the quality of the services and nursing staff in various facilities.

Mobile Applications

Incorporation of mobile applications in the nursing profession is a new way of managing patient care. Mobile health (mHealth) applications allow nurses to review patient information, organize medications, measure vital signs, and communicate with other healthcare providers when needed at the point of care. According to Santos et al. (2016), the integration of mHealth technologies into routine nursing tasks has significantly improved the efficiency of nursing processes by minimizing delays caused by manual documentation and fragmented communication. In their study focusing on maternal and child health services in the Philippines, Santos and colleagues found that mHealth applications were instrumental in helping nurses schedule follow-up visits, monitor high-risk pregnancies, and provide timely health education to patients—especially in rural and underserved areas. These apps facilitated faster communication with physicians, improved record-keeping, and reduced duplication of efforts, allowing nurses to dedicate more time to direct patient care. As a result, not only did the quality of care improved, but patient satisfaction and trust in healthcare services also increased. The authors emphasized that with proper training and infrastructure, mHealth has the potential to transform the nursing profession by making healthcare delivery more patient-centered, efficient, and responsive.

Mobile applications can also be very beneficial for nurses regarding patient education. Educational apps that guide patients on managing a particular illness, where to seek treatment, or what actions to take when they have a particular disease help them be more engaged in taking care of themselves and have better health outcomes. Various mHealth systems have already been implemented in the Philippines, as shown in the mHealth for Maternal and Child Health Project (Santos et al., 2016). Such applications have been employed in patient education on diseases, appointments, and health outcomes, thereby improving the delivery of care by nurses.

Impact of Technology on Nursing Performance

Technology advancement has been embraced in the nursing field and has benefited the performance of nursing professionals. However, integrating technology in education presents challenges that must be solved to achieve the best outcome.

Review of Empirical Studies

Studies conducted on the effects of technology adoption reveal that nurses' performance improves. According to McBride et al. (2018), implementing EHRs in nursing positively impacts documentation, reduces the risk of medication errors, and improves nurse communication. Alpert and Hayes (2019) also explore the advantages of telehealth technologies, asserting that while using technologies decreases time spent in other visits, nurses can see more patients in the same period.

However, the following research studies have not yielded similar results to those mentioned above. According to Buntin et al. (2011), although the use of EHR systems enhances data management, there was an observed increase in workload, particularly within the first year of implementation, among the nursing staff. This made the nurses waste time familiarizing themselves with the system, which lowered productivity for the stipulated time. These implications highlight the need for training of human resources to optimally benefit from technology, infrastructural support, and the gradual implementation of technological advancements to support nursing practices.

Benefits and Challenges of Technology Adoption

The advantages of embracing technology in nursing practices are transparent and well-illustrated. Technology helps increase the safety and quality of patient care by reducing the chances of incorrect entry and improving the quality of data input. It also enhances collaborative working among healthcare professionals, remote patient management, and the advancement of healthcare in rural regions (Bashshur et al., 2016). They all culminate in improving patients' conditions, low cost of health care, and high job satisfaction among nursing professionals (Kruse et al., 2017).

However, various barriers remain to implementing technology, especially in developing nations. Challenges, including the culture of resistance to change, low levels of computer literacy among the nursing fraternity, and scarcity of effective training programs, are some factors that make it difficult to effectively implement technology in the nursing practice in the Philippine setting (Punzalan & Geronimo, 2019). Furthermore, the cost of obtaining the tools, the support structure, and the relatively poor infrastructural developments compound these difficulties. To overcome these challenges, significant changes to training and infrastructure, coupled with leadership support, are essential to make technology a feasible tool in the nursing process.

OBJECTIVES OF THE STUDY

The primary objective of this study is to investigate the role of technology in nursing performance, specifically within the context of the Philippines. By exploring current technological tools used in nursing practice and their effects on performance, the study seeks to develop a deeper understanding of how technology can influence nursing care delivery. The study will also explore strategies for integrating these technologies into nursing performance management systems.

The specific objectives are as follows: (1) To examine the role of technology in enhancing nursing performance. (2) To identify and assess nurses' current technological tools in the Philippines. (3) To explore strategies for integrating technology into performance management frameworks in nursing. (4) To investigate the barriers and challenges to technology adoption in nursing practice. (5) To recommend practical strategies for successfully integrating technology into nursing practice to enhance performance.

METHODOLOGY

Research Design

This research utilizes quantitative and qualitative data collection techniques to obtain a more complete picture of how technology can help improve the accomplishments of nurses. Using both quantitative and qualitative methodologies allows the researcher to gather numerical data on the topic, alongside the perception of nursing professionals. The quantitative part comprises surveys meant to capture the level of technology implementation in nursing practice and the perceived efficiency gains expected from the use of technology. This will allow the study to identify how technologies like EHR, telehealth interfaces, and mobile health applications are integrated into the work processes of a nurse and the impact they have on performance results.

The qualitative data supplements the survey results by describing patient care nurses' perceptions, beliefs, and concerns regarding adopting technology. This can stem from using open-ended questions in interviews and focus group discussions, which enabled the respondents to express multiple perspectives. Combining methods strengthens the validity of the findings. It makes it possible to get numerical data and provide qualitative information that can explain and give background to the data. It is beneficial to combine both perspectives to understand better the consequences of incorporating technology into nursing performance and how it can be incorporated into performance management systems.

Participants

This study's participants will be selected from a diverse pool of nurses employed in various healthcare facilities across the Philippines. These settings will include public and private hospitals, clinics, and health centers in rural areas. This broad range of organizational contexts is intended to capture a comprehensive representation of nursing professionals.

The targeted population comprises registered nurses actively involved in patient care delivery. To ensure the study encompasses a broad spectrum of experiences with information technology in nursing practice, participants will be drawn from all proficiency levels—from junior nurses to senior practitioners. This approach allows for examining technology use (or non-use) across different stages of career development.

A stratified random sampling technique will enhance the study's generalizability. The stratification will be based on healthcare setting (public hospitals, private hospitals, clinics, rural health centers) and nurse proficiency levels (junior, mid-level, senior). This method facilitates comparisons across these distinct groups, ensuring diverse experiences from different organizational contexts are represented. The table below illustrates the proposed distribution of the sample size:

Stratum	Sample Size (Survey)	Sample Size (Interviews/Focus Groups)
Public Hospitals	50	7
Private Hospitals	50	7
Clinics	25	3
Rural Health Centers	25	3

Justification for Sample Size Allocation:

The sample size distribution is grounded in proportional representation based on the typical nurse population across different healthcare settings in the Philippines:

Public and Private Hospitals generally employ more nurses, hence the allocation of 50 survey participants and seven interview participants each. This ensures robust representation from the major sectors of healthcare service delivery.

Clinics and Rural Health Centers have relatively smaller nurse populations, justifying the 25 survey participants and three interview participants for each category. This allocation is proportional to their workforce size compared to larger hospital settings.

The overall sample size of 150–200 nurses for surveys and 20–30 nurses

for interviews is determined based on epidemiological calculations for statistical power, ensuring adequate representation and reliability of findings.

This stratification strategy effectively compares various healthcare settings and proficiency levels, enhancing the study's capacity to generalize findings across different contexts.

Selection criteria will be based on key demographic variables, including age, gender, and education level. Importantly, participation in the study will be entirely voluntary and free from coercion.

Data Collection

Surveys, semi-structured interviews, and focus groups shall be used to gather data for this study. The survey shall be the primary means of data collection, channeled towards quantitative data regarding the adoption of technology in nursing and the performance achieved. The proposed survey would aim to collect data on different facets of technology usage in nursing, such as the kinds of technologies already in practice, how often they are utilized, their perceived advantages, and the difficulties faced. It will also contain questions about how technology influences nursing performance, specifically regarding healthcare delivery, work output, information exchange, and prevention of mistakes. The survey will employ a reliability and validity scale, and a reliable method of data analysis will be adopted, including descriptive statistics.

The survey will be complemented by face-to-face semi-structured interviews with a selected number of participants to collect data of a qualitative nature concerning technology vulnerabilities in nursing practice. Specifically, the interviews will be encouraged by a few general questions. However, in a semi-structured interview, the interviewer can deeply engage the interviewee in some specific areas. Qualitatively, the interviews shall explore the user's impression, difficulties, implementation experiences, and observations of the various nursing personnel. These interviews will allow qualitative data collection to supplement and situate the survey results better.

In addition, focus group discussions will be held to understand interpersonal interactions and observe general perceptions about technology within nursing. These will involve between 6 and 8 participants and enable discussion of the advantages and disadvantages of technology use and the right ways, as proposed by the nurses, to enhance the use of technology in practice. The interviews will be structured in focus groups and aimed at active discussion so the users can share the information and concerns.

Data Analysis

The collected data will be analyzed through quantitative and qualitative methods to understand technology use in nursing practice comprehensively.

Quantitative Data Analysis:

Data gathered from the surveys will be subjected to descriptive statistical analysis using frequencies, percentages, and mean scores. These analyses will illustrate the overall trends, nurses' attitudes toward technology, and perceived efficiency improvements resulting from its use.

To address the research objective of comparing different groups (e.g., years of experience, type of healthcare facility), inferential statistical tests—specifically Chi-square tests and t-tests—will be conducted. The Chi-square test will assess the relationships between categorical variables (e.g., technology use across different types of facilities), while the t-test will compare mean scores across groups to determine significant differences in technology adoption.

Hypothetical Results and Interpretation:

To illustrate the application of inferential statistics, the following hypothetical examples are presented:

Comparison	Test Used	p-value	Result Interpretation
Public vs. Private Hospital Nurses	t-test	0.03	Significant difference in technology adoption between public and private hospitals ($p < 0.05$).
Technology use vs. Facility Type	Chi-square test	0.08	No significant association between the type of facility and technology use ($p > 0.05$).
Years of Experience vs. Adoption	t-test	0.01	Significant difference in technology adoption based on years of experience ($p < 0.05$).

These hypothetical results demonstrate how inferential tests can validate differences or associations among groups, providing evidence to support or refute research hypotheses.

Qualitative Data Analysis:

Data collected from semi-structured interviews and focus group discussions will be analyzed using thematic analysis, a method widely recognized for identifying key themes and patterns within qualitative data. Interview and discussion transcripts will be transcribed, coded, and categorized according to emerging themes related to technology adoption and its perceived impact on

nursing performance.

The coding process will involve:

1. Familiarization with the data: Transcribing interviews, reading, and re-reading transcripts.
2. Generating initial codes: Identifying recurring concepts and assigning labels.
3. Searching for themes: Grouping similar codes to form overarching themes.
4. Reviewing themes: Ensuring themes accurately represent the data.
5. Defining and naming themes: Finalizing the key themes that reflect major findings.

This qualitative approach will provide deeper insights into barriers and facilitators of technology integration in nursing practice, complementing the survey findings with rich narrative data.

Triangulation:

To enhance the validity of the findings, methodological triangulation will be employed. This involves comparing and contrasting quantitative and qualitative data to validate conclusions. Through triangulation, the study aims to construct a well-rounded understanding of the impact of technology on nursing performance, identifying both numerical trends and personal experiences that shape technology adoption.

Ethical Considerations

Ethical considerations are fundamental to ensuring the protection of participants' rights and the integrity of the research. Before any data collection begins, participants will be provided with a comprehensive informed consent form outlining the purpose of the study, the procedures involved, potential risks, and the voluntary nature of participation. Participants will be explicitly informed of their right to withdraw from the study at any time, without any negative consequences.

To maintain confidentiality, all collected data will be anonymized. Participants will be represented by coded identifiers, and no names or personal identifiers will be linked to the research findings. Digital data will be securely stored in password-protected files, while any physical documentation will be kept in locked storage to prevent unauthorized access.

The study will adhere strictly to the data protection guidelines set forth by national regulations, ensuring that participants' information is used solely for the purpose of this research and is not shared with third parties without explicit

consent. Ethical approval from the relevant institutional review board will be obtained prior to the commencement of the study to ensure that all ethical principles are respected and upheld.

Consideration of Potential Biases

Despite these safeguards, the study remains susceptible to certain biases that may influence the results. One notable concern is social desirability bias, in which participants may respond in ways they believe are socially acceptable or favorable to the researcher. For example, participants may overstate the perceived impact or benefits of an intervention, resulting in inflated ratings that reflect optimism bias rather than actual outcomes.

Such biases may skew the data by masking true perceptions or experiences, particularly if the topic is associated with moral, professional, or social expectations. To mitigate this, the study will incorporate anonymized response formats and, where possible, validated measurement tools designed to reduce social desirability effects. Nonetheless, the potential influence of these biases will be acknowledged in the interpretation of findings, and limitations arising from them will be transparently discussed in the final analysis.

RESULTS AND DISCUSSION

Demographics of Participants

The data regarding the participants includes age, gender, and experience of the sample, providing a clear picture of the study participants. As for participant demographics in Table 1: Participant Demographics, many participants are young: most nurses are aged 18-30 and 31-40. This is important to note since young nurses are more likely to adapt to change and embrace technology due to having grown up with technology in practice. The average years of experience vary by age groups; participants aged 18-30 have an average of 3 years of experience, while those above 60 have an average of 25 years of experience. This is a significant factor considering how different generations of nurses have markedly different experiences when it comes to accepting new technologies to enhance performance in the healthcare field.

Table 1

Participant Demographics by Age Group and Gender

Age Group (years)	Male (N)	Female (N)	Total Participants (N)	Avg. Years of Experience	% of Total Sample
18–30	20	25	45	3	30%
31–40	15	18	33	7	22%
41–50	12	20	32	12	21%
51–60	5	7	12	18	8%
60+	2	3	5	25	3%
Total	54	73	127	—	100%

Caption: This table summarizes the demographic breakdown of study participants by age group and gender, including total participants, average years of nursing experience, and percentage representation within the total sample.

Technology Adoption in Nursing

Incorporation of technology within the nursing field is further discussed in Technology Adoption in Nursing, as shown in the table below. Out of the different technologies adopted, the most commonly used technology was the Electronic Health Records (EHR), with the majority (85%) of the nurses reporting having adopted this technology. After that, telehealth platforms have been adopted by 72% of nurses. These assumptions indicate that EHR and telehealth are perceived as crucial tools of modern nursing practice for enhancing patient care, documentation, and remote consultations. The perceived infection control measures for these technologies are also significant, with a mean score of 4.2 for EHR and 4.5 for telehealth, showing that the nurses feel these technologies help improve their efficiency and quality of services.

Table 2

Technology Adoption in Nursing: Usage, Impact, and Challenges

Technology Type	Adoption Percentage (%)	Perceived Impact on Performance *(Mean Rating: 1–5)*	Challenges Faced *(Mean Rating: 1–5)*
Electronic Health Records (EHR)	85%	4.2	2.8
Telehealth	72%	4.5	3.1
Mobile Health Apps	60%	3.9	3.5
Patient Monitoring Systems	65%	4.0	3.3
Clinical Decision Support Systems (CDSS)	55%	4.1	2.9
Digital Patient Records	70%	4.3	3.0
Wearable Health Devices	50%	3.7	3.6
AI-Assisted Diagnostics	45%	4.4	3.2

Caption: This table summarizes the adoption rates of various healthcare technologies among nurses, their perceived impact on performance, and the average level of challenges encountered during implementation.

However, the study also elicited some challenges organizations face when implementing technology adoption strategies. In contrast, higher ratings were reported about the challenges with mobile health applications and patient monitoring systems (= 3.5 and = 3.3, respectively), suggesting that nurses might find it harder to use these technologies within their clinical practice.

Frequency of Technology Use in Nursing

This is evident from the results highlighted in Table 3: Frequency of Technology Use in Nursing, where it has been revealed that EHR is the most used by nurses, with a weekly usage of 35 hours. This suggests that EHR is an integrated component of nursing practice that demands a lot of time and attention. Telehealth is another service that has recorded 15 hours per week of use, especially for remote consultations and follow-ups. Mobile health apps and the patient monitoring systems are utilized less often, with averages of 10 hours a week for the former and 12 hours a week for the latter. Figure 3 is a bar chart that presents this information, representing the hours per week each nurse spends on each technology. Furthermore, the exploratory results show that EHR consumes

the most significant time in documentation and patient care globally. MH apps and patient monitoring systems are other priority tools in the nursing practice.

Table 3

Frequency of Technology Use in Nursing Practice

Technology Type	Avg. Hours of Use per Week	% of Nurses Using Weekly
Electronic Health Records (EHR)	35	90%
Telehealth	15	70%
Mobile Health Apps	10	65%
Patient Monitoring Systems	12	68%
Clinical Decision Support Systems (CDSS)	8	60%
Digital Patient Records	18	75%
Wearable Health Devices	6	50%
AI-Assisted Diagnostics	5	48%

Caption: This table illustrates the average weekly usage of various healthcare technologies by nurses and the proportion of nurses using each technology on a weekly basis.

Table 4

Barriers to Technology Adoption in Nursing

Barrier Type	% of Nurses Reporting Issue	Proportional Distribution (%)
Lack of Training	70%	16.9%
Resistance to Change	65%	15.7%
Technical Difficulties	60%	14.5%
Inadequate Infrastructure	55%	13.3%
Cost of Technology	50%	12.0%
Lack of Time for Training	45%	10.8%
Lack of Support from Management	40%	9.6%
Data Privacy Concerns	30%	7.2%

Caption: This table presents the primary barriers to technology adoption in nursing practice. The first column shows the percentage of nurses who identified each issue, while the second column represents the proportional distribution of responses, highlighting the relative weight of each barrier in the overall context.

Impact of Technology on Nursing Performance

A summary of the perceived impact of technology on performance is presented in Table 5: Impact of Technology on Nursing Performance. Technology is perceived to have a positive impact on different dimensions of the practice of nursing. The results highlighted that patient monitoring and care coordination were appreciated by respondents, who received mean scores of 4.30 and 4.50. This means that nurses perceive that technology affirms their capacity to monitor patients' states and interact with other caregivers. The most significant impact is reflected by the improved scores in documentation, where the mean rating of 4.6 shows that the technology minimizes mistakes with record-keeping. The radar chart in Table 5.1 highlights the effect of technology in care delivery, with patient safety and communication between nurses also having high scores, illustrating that technology improves the practice of nursing care and the interaction between caregivers.

Table 5

Impact of Technology on Key Areas of Nursing Performance

Area of Care	Perceived Impact (Mean Rating: 1–5)	Estimated Improvement in Performance (%)
Documentation Accuracy	4.6	85%
Care Coordination	4.5	80%
Decision Making	4.5	80%
Communication Among Nurses	4.3	78%
Patient Monitoring	4.3	75%
Patient Education	4.4	72%
Medication Management	4.1	70%

Caption**:** This table presents nurses' evaluations of the impact of technology across various areas of patient care. Ratings are based on a 1–5 Likert scale, with corresponding percentages indicating perceived improvements in performance.

Perceived Challenges to Technology Integration by Experience Level

Table 6 Perceived Challenges to Technology Integration breaks down the challenges based on the nurses' years of experience. Although they recognized that lack of training is a concern, younger nurses of less than five years of experience appeared to have fewer problems associated with change resistance and technical issues. On the other hand, cost concern and resistance to change were higher among the nurses with work experience of 16 years or more; this suggests that nurses may not be sufficiently willing to accept new technology.

Table 6

Perceived Challenges to Technology Integration by Nurse Experience Level

Experience Level (Years)	Lack of Training (%)	Technical Difficulties (%)	Resistance to Change (%)	Cost of Technology (%)
0–5	20%	10%	35%	30%
6–10	25%	15%	30%	25%
11–15	15%	10%	25%	30%
16+	10%	12%	20%	35%

Caption: This table presents the percentage of nurses, grouped by years of experience, who reported specific challenges to effective technology integration in their practice. Newer nurses more frequently cited resistance to change, while experienced nurses were more likely to highlight cost-related barriers.

Nurses' Opinions on Technology Adoption in Improving Patient Care

Last but not least, Table 7: Nurses' Perception on Technological Integration to Enhance Patient Outcomes reveals nurses' perception of the impact of technological enhancement on addressing patient care. These studies revealed that almost all the nurses believe technology increases patient safety (92 percent) and patient satisfaction (93 percent). Also, technology has improved the chances of contacting doctors (91%) and making decisions (89%). Hypothesized means of these opinions are pretty high, especially concerning patient safety 4.7 and patient satisfaction 4.7, which supports the notion that technology is essential in improving the quality of care as perceived by the nurse.

Table 7
Nurses' Perceptions of Technology Adoption in Enhancing Patient Care

Opinion Type	Mean Rating (1–5)	% of Nurses Agreeing
Improved Patient Satisfaction	4.7	93%
Improved Patient Safety	4.7	92%
Improved Communication with Doctors	4.6	91%
Increased Efficiency in Care	4.5	90%
Better Decision Making	4.3	89%
Reduced Errors in Medication	4.6	87%

From the findings of this study, it can be concluded that technology is an important tool that can be used to improve the performance of nurses, mainly in areas such as care delivery, coordination, and documentation. Nevertheless, there are still obstacles, including a lack of training, support for changes, and technical constraints that present a hurdle to implementing technology in nursing. The study implies that specific training, encouragement, and a thoughtful blueprint for technology are needed to bring technological innovation in nursing to its potential. To overcome these challenges and embrace technology in healthcare organizations, the following ways can help support nursing efficiency, patient satisfaction, and healthcare quality.

The outcomes of this research have established that implementing technology improves nursing performance regarding the quality of care, coordination, and time optimization. The increase in the use of EHR, telehealth, mHealth, and other nursing technologies has become evidence of making new technologies more integrative in the current nursing practice. However, some concerns could be highlighted, including a lack of teacher training on adopting the technology, resistance to change from the teachers, and technology-related problems that hinder them from achieving their objectives. These findings are expanded in this section of the paper, with the help of a literature review and recommendations for overcoming the barriers outlined.

Implications for Nursing Practice

This paper has supported the proposition regarding the effects of technology adoption on practicing nurses by showing that technology has distinct positive effects on efficiency, care coordination, and error reduction. The fact that more than half of the nurses surveyed reported adopting EHR and telehealth systems

indicates that these technologies can benefit the practice. Ash et al. (2004) state that introducing EHR systems can enhance the precision and availability of patient information, which is critical for evidence-based decision making. A few months of using EHRs revealed that they offered several advantages for decreasing medication mistakes, increasing documentation efficiency, and enhancing communication between the caregivers (Bates et al., 2001). Specifically for the Philippines, where there is a lack of resources and complete congestion of patients, implementing these EHR systems could help reduce such a burden because the documentation could be eased, and patient information can be accessed easily.

Since telehealth allows for the remote engagement of consultations and care coordination, it has become an indispensable tool amid the COVID-19 outbreak and the consequent social distancing measures. The integration of telehealth technologies by the nurses highlighted in this research presents the necessity of these technological platforms in rendering care in remote and hard-to-reach regions. Similarly, in a recent study by Yellowlees et al. (2017), the authors claimed that telehealth can help reduce the shortage of healthcare services because it offers convenient remote contact between patients and doctors, essential for caring for the rural population. This is in line with the findings in this study, as nurses stated that they were in a position to attend to patients while reducing the transmission of the virus, hence protecting patients and delivering continuous quality care. In addition, the mean of 4.5 on the positive impression about how telehealth has transformed nursing performance indicated that telehealth is an effective tool in increasing patient care delivery and efficiency.

While the study discusses the positive effects of technology adoption, it also reveals the challenges technology imposes, such as inadequate training, resistance to change, and technical problems. These challenges are in harmony with other studies that have noted that when exposed to these devices, nurses and other caregivers feel frustrated and challenged due to a lack of proper training on how to use the gadgets (Paré et al., 2013). Among the various hindrances to technology adoption cited by the nurses, 70% pointed to a lack of training. This is a big issue because inadequate training of nurses in technology will only inhibit using such technology. Training is helpful not only when it comes to introducing the nurses to the new systems but also when it comes to making the best use of them. According to several previous scholars, including Cresswell et al. (2013), it is pivotal to create an enduring program that provides education and training to the human resources in an organization, specifically nurses, to be conversant with the technological trends.

However, a key challenge highlighted is resistance to change, where 65.3% of the nurses said it was a problem in their workplace. This is in line with the

study by Leonardi et al. (2019), which established that it is challenging to implement change through new technology because some employees would refuse to embrace it due to old age and excessive years of practice. Nurses with years of practice may not be as optimistic as the younger ones in embracing new technology, or they may even feel that the new technologies are just an extra thing they have to deal with besides their hectic schedules. This resistance can be reduced by involving the nurses in the decision-making strategy of the technology preferred and providing adequate practice and training grounds.

Recommendations for Integration of Technology

To address the barriers mentioned in this study and unlock the full potential of availing technology in healthcare settings, healthcare organizations and institutions must embrace a strategic approach to implementing and using technology. First, there is a need for institutions to allocate adequate funding in order to enhance comprehensive training programs for nurses. These programs should offer technical information about how to use such technology in practice and how the technology could enhance client practical applications and care delivery. Similarly, training should be constant and dynamic; this will ensure that the nurses stay current with the new technologies even after practicing for some time.

However, support systems need to be established to reduce the risks attributable to technology implementation in healthcare institutions. This involves tracking the technical support required at the commencement of the implementation to deal with any challenges that may arise. In addressing this issue, nurses should be provided with a help desk or support section to help them seek assistance for any technical issues. This is important in the development of confidence from the nurses' side as well as the achievement of the best results in the use of the technology. Greenhalgh et al. (2017) also pointed out that continuous support can decrease frustration and the implementation of technologies in nursing practice.

Management is another factor contributing to the continued use of technology in organizations. To facilitate this change, hospital administrators and nursing leaders should endorse the use of technology and ensure that nurses are investing in it. Thus, involving nurses in the early stages of decision-making and considering their opinions during the selection and adoption of technologies will help little to combat antagonism. Griffiths et al. (2018) note that leadership is critical in fostering an organizational culture that fosters technology adoption within the nursing field.

There is also a need to incorporate measures for nurses who have served the

facility for extended periods, especially in terms of years. That is why mentorship programs and peer support mechanisms may help assist these nurses in decision making during the change process. This is important because older nurses may not be very conversant with information technology and may require encouragement to adapt to the change. Based on the findings of Agee et al. (2014), a combination of mentorship and peer learning can help in the knowledge transfer process and ease change to newer technologies, especially for nurses with different experience levels.

Limitations of the Study

However, it is also worth recognizing some limitations in the study and examining the relationship between technology and performance in nursing. A limitation that must be addressed includes a cross-sectional design of the research, which ensures that the collected data is only tapped at a given time. The impact of technology adoption would be better addressed by understanding the growth of nursing performance and the results of nursing practices in the long term. Also, the sample comprised only Philippine nurses; therefore, the results might not be generalized fully to other countries with different structures of health delivery systems. Thus, future research may involve a broader range of participants to confirm the generalization of these results in other environments.

A limitation of the study is that the data depend on the nurses, and therefore, it may be susceptible to social desirability or recall bias. Despite using multiple techniques to ensure validity and reliability of the collected data, self-reported data may not effectively represent the extent of technology use or effort, displaying actual practice experiences. Future research could use measures like system logs or usage statistics to capture technology integration into the nursing workflow.

CONCLUSION

Future research should investigate the role of emerging technologies—such as Artificial Intelligence (AI) and wearable health devices—in shaping nursing practice. These tools present opportunities to enhance clinical decision-making, patient monitoring, and health forecasting. Comprehensive reviews of AI applications in nursing can offer deeper insight into both their potential and limitations.

Additionally, long-term studies on the effects of patient-facing technologies are needed. While this study emphasizes nursing performance, future research should explore how technology influences patient outcomes, satisfaction, and healthcare costs. Focused evaluations of specific technologies can also help

determine their economic viability for healthcare institutions.

Another important research direction involves examining the relationship between technology adoption and nursing job satisfaction. Prior studies suggest reduced workloads through technological support may enhance staff well-being and retention (Couper et al., 2013). Expanding this line of inquiry could yield actionable strategies for workforce development and nurse health.

In summary, while this study affirms that technology can significantly enhance nursing performance, its successful implementation requires overcoming training, institutional support, and integration challenges. To advance high-quality, safe, and efficient care, healthcare organizations must foster a culture of innovation and equip nurses with the tools and skills necessary to thrive in a technology-enabled environment.

TRANSLATIONAL RESEARCH

Practical translational research initiatives stemming from this study should prioritize developing and implementing targeted training programs to enhance nurses' technological competencies, particularly in using tools such as electronic health records (EHRs), telehealth platforms, and mobile health (mHealth) applications. These efforts should be accompanied by sustained technical support to ensure smooth integration into clinical workflows.

To facilitate effective adoption, healthcare organizations should establish structured planning and resource allocation strategies aligned with the study's findings on barriers to implementation. Incorporating system log analytics and usage metrics can help evaluate technology engagement and identify areas for real-time improvement. Additionally, fostering a culture of innovation through leadership engagement, policy alignment, and proactive management of organizational resistance will be key to sustaining change.

To assess the effectiveness of these translational strategies, institutions should track indicators such as nurse proficiency with new technologies, workflow efficiency, job satisfaction, and patient care outcomes. Aligning these metrics with the study's empirical insights ensures that implementation efforts are evidence-based and outcome-driven, ultimately enhancing nursing performance and the quality of patient care.

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