Knowledge of Hospital Information Management System among Nurses

KRYSTAL MAE A. RABANG, RN[1], FREDA B. LOPEZ, MAN, EDD[2]
[1,2] *Degree Master of Arts in Nursing, Institute of Graduate and Advanced Studies, Urdaneta City University*

Abstract—This study aimed to determine the knowledge and challenges nurses encounter in using the Hospital Information Management System in selected hospitals in Eastern Pangasinan. It examined the relationship between nurses' demographic factors and their knowledge of and perceived challenges regarding HIMS. A descriptive research design was employed, with a survey questionnaire as the primary tool for gathering data. The nurse respondents were predominantly young adults, female, unmarried, earning above-average income, holding Bachelor's degrees, and staff nurses from different areas of the hospital. Most nurses assigned to the emergency room had attended a few trainings and had been in the service for a few years. Nurses generally perceived they had the necessary information about using technology in patient care. However, they encountered challenges, particularly the lack of skills, negative attitudes, and security issues related to its use. Statistical analyses revealed no significant differences or relationships between the nurses' demographic profiles and their knowledge or challenges of implementing the system.

Indexed Terms- challenges, hospital information management system, knowledge, nurses

I. INTRODUCTION

Nowadays, information technology is significantly important for productivity, healthcare service quality, and competitiveness of health institutions. The increasing pressures for reducing healthcare costs, improving healthcare quality, ensuring patient safety, and reducing medical failures have led to a rising use of information systems in healthcare organizations. Health information technologies (HITs) present numerous opportunities for improving and transforming healthcare, including reducing human errors, improving clinical outcomes, facilitating care coordination, improving the efficiency of practice, and tracking data over time. HITs involve various technologies that range from simple charting to more advanced decision support and integration with medical technology. Therefore, health managers may take more assertive actions when adopting health information technologies (Donmez et al., 2020).

Hospital Information Management Systems (HIMS) specifically offer timely, accurate, and complete patient information, significantly improving healthcare service delivery. However, readiness for HIMS adoption remains a challenge, particularly among older healthcare workers, emphasizing the need for targeted interventions such as improving computer literacy, fostering positive attitudes toward technology, and ensuring the availability of necessary infrastructure (Ngusie et al., 2022).

Effective information management is crucial in the healthcare industry, influencing service efficiency, physician decision-making, and patient outcomes. Good information integration is essential to support patient care and optimize service delivery across pharmaceutical production, medical supply management, and healthcare operations (Lancharoen et al., 2020). Health Information Systems (HIS) further integrate health functions across departments, improving management processes and unifying people, technology, and operations (Epizitone et al., 2023).

Nurses play a critical role in patient care and are primary users of HIS. Nursing Information Systems (NIS), as a sub-system of HIS, support nurses by managing clinical data and streamlining administrative tasks, thereby enhancing the quality of care (Ahmadian et al., 2017). Despite the potential benefits, challenges such as insufficient technical skills, security concerns, and inadequate digital

education among nurses persist, hindering effective utilization (De Leeuw et al., 2020).

Moreover, factors such as security issues, technical skills, changing the working processes, and lack of user training remain key barriers to effective system adoption (Ahmadian et al., 2017). These barriers have not been studied from the perspective of nurses, who are among the most important employees in the healthcare sector.

As the implementation of HIS has expanded, nursing information systems have also become increasingly critical. Given that nursing services constitute a significant portion of hospital operations and costs, effective nursing management through HIS can substantially impact both clinical practice and the financial stability of healthcare institutions.

II. METHODOLOGY

Research design. The study employed a descriptive research design to assess nurses' knowledge and perceived challenges about HIMS. Descriptive research is useful when the goal is to discover traits, frequencies, trends, and categories (McCombes, 2019). The descriptive survey method enables the researcher to gather demographic data and measure perceptions among nurses regarding HIMS.

Population and Locale of the Study. The respondents were nurses from selected hospitals in Eastern Pangasinan, selected through purposive sampling. A total of 60 nurses participated. The data was gathered during the Second semester of Academic Year 2023-2024.

Data Gathering Instrument. A survey questionnaire was used as a primary tool to gather the needed data. The questionnaire was composed of two parts:

Part I: Demographic information, including age, sex, civil status, monthly family income, highest educational attainment, Hospital (government or private), position/designation, employment status, workplace or department, number of years in nursing service, and a number of related trainings related to HIMS.

Part II: Questions intended to determine the knowledge and challenges of HIMS among nurses, rated on a five-point Likert scale.

Validation of Instrument. The questionnaire items were adapted from several studies and validated by a faculty researcher, an instructor, and staff nurses, achieving high validity.

Data Gathering Procedure. Permissions were obtained from hospital administrators and respondents before administering the questionnaires personally to ensure clarity and address misconceptions, and supervise the entire process.

Ethical Considerations. The study adhered to ethical standards by ensuring informed consent, anonymity, confidentiality, voluntary participation, and data protection. The researcher committed to fairness, transparency, and the equitable treatment of all participants.

Treatment of Data. Appropriate statistical tools were applied to analyze the collected data.

Descriptive statistics, including frequency and percentage, were used to summarize the demographic profiles of the respondents. Then, a five-point Likert scale and average weighted mean were utilized to assess nurses' knowledge on HIMS and the challenges encountered related to HIMS. Also, Pearson's Correlation Coefficient determined the differences and relationships between the variables.

Interpretation scales are as follows:

For Knowledge:

Numerical Value	Range	DE	TR
5	4.50–5.00	Always	Highly Knowledgeable
4	3.50 – 4.49	Often	Knowledgeable
3	2.50-3.49	Sometimes	Moderately Knowledgeable
2	1.50 – 2.49	Seldom	Slightly Knowledgeable
1	1.00 – 1.49	Never	Not Knowledgeable

For Challenges:

Numerical Value	Range	DE	TR
5	4.50 – 5.00	Always	Highly Encountered
4	3.50 – 4.49	Often	Encountered
3	2.50 – 3.49	Sometimes	Moderately Encountered
2	1.50 – 2.49	Seldom	Slightly Encountered
1	1.00 – 1.49	Never	Not Encountered

III. RESULTS AND DISCUSSION

Part I. Respondent's Profile

Age. The majority of the respondents were aged 31-35 years old (30%); followed by 26-30 years old (28%), indicating a predominantly young adult population. Erik Erikson (as cited by Kessler, 2020), identifies young adulthood as a crucial stage focused on identity formation.

Gender. The sample was female-dominated, with 28 females (56%), while 22 were males (44%), reflecting the continuing trend of nursing being a predominantly female profession despite changes in gender norms (Marshall, 2020).

Civil status. Most were single, with a frequency of 30 (60%), followed by married, with a frequency of 20 (40%). Results showed that the respondents were not into marital relationships and, more often, living with their families. There is no proven correlation between being a nurse and being single.

Monthly family income. Most respondents earned an income of P31,000-P40,000 (38%); followed by P21,000-P30,000 (24%), suggesting above-average salary. For nurses in public health facilities, their pay follows the salary grade from the government. Nurse 1, with a salary of grade 15, receives P36,619 a month according to the National Economic Development Authority (NEDA, 2024).

Position. The majority (78%) held staff nurse positions, followed by head nurse (14%), indicating that most of them hold the most common position for nurses. According to Peters (2021), a staff nurse is a registered nurse who provides quality care, conducts initial assessments, monitors vital signs, and supports patient recovery.

Employment status. Most were contractual employees (74%), followed by regular (20%), and job order (6%), indicating limited job security. This implies that the respondents still held a renewable contract of employment and no security of tenure. According to Bruce (2021), contractual employees receive a fixed fee to work for a specified timeframe or on a certain project.

Department. The majority were assigned to the General ward (70%), followed by ER (12%). This implies that the respondents were assigned to the wards where most patients are.

Number of years in service. Most respondents (58%) had 1-5 years of service, followed by 6-10 years (22%), implying that most respondents were in the service for a few years. Services are a recognition acknowledging how long an employee has stayed at an institution (Tsang, 2021).

Number of Relevant Trainings. Over half (54%) attended 1–2 relevant training, followed by 3-4 relevant training (34%). This implies that the nurses had few numbers of training related to their areas of practice. Mlambo et al. (2021) cited that Continuing professional development (CPD), like attending seminars/trainings, is central to nurses' lifelong learning and is vital to keeping nurses' knowledge and skills up-to-date.

Table 1: Distribution of Respondents in terms of their Profile Variables

n=50

Profile Variables	Frequency	Percentage
Age (in years)		
18 – 25	9	18.0
26 – 30	14	28.0
31 – 35	15	30.0
36 – 40	8	16.0
41 – 45	4	8.0
Gender		
Male	22	44.0

Profile Variables	Frequency	Percentage
Female	28	56.0
Civil Status		
Single	30	60.0
Married	20	40.0
Monthly Family Income (Php)		
10,000 – 20,000	8	16.0
21,000 – 30,000	12	24.0
31,000 – 40,000	19	38.0
41,000 – 50,000	6	12.0
51,000 and above	5	10.0
Highest Educational Attainment		
Bachelor's Degree	35	70.0
With Master's units	13	26.0
Master's Degree	2	4.0
Position		
Staff Nurse	39	78.0
Head Supervisor	7	14.0
Nurse supervisor	2	4.0
Assistant Chief Nurse	2	4.0
Employment Status		
Job Order	3	6.0
Contractual	37	74.0
Regular	10	20.0
Department		
Operating Room	3	6.0
Emergency Room	6	12.0
Delivery Room	3	6.0
Intensive Care Unit	3	6.0
General Ward	35	70.0
Number of Relevant Trainings		
1 – 2	27	54.0
3 – 4	17	34.0
5 and above	6	12.0
Number of Years in Nursing Service		
1 – 5	29	58.0
6 – 10	11	22.0
11 – 15	8	16.0
21 and above	2	4.0

Part II. Knowledge of Nurses in Hospital Information Management System

All indicators were rated as "Highly Knowledgeable," with the highest being the recognition that the "Hospital Information Management System (HIMS) plays an essential part in every hospital", receiving a weighted mean of 4.90 ("Strongly Agree"). This highlights the critical role of HIMS in improving healthcare outcomes, as supported by Donmez et al. (2020), who noted that health information technologies enhance care quality, reduce errors, and improve system efficiency.

The lowest-rated indicators, both with a mean of 4.60, are "HIMS is easy to use and user-friendly interface," and "Hospital Information Management System is designed for faster and efficient IP admission, transfer and discharge management". This implies that an innovative system in healthcare is very advantageous in patient care, affirming Ngusie et al.'s (2022) view that healthcare system innovations offer significant benefits, such as cost reduction, improved care, and better data management.

Overall, the nurses' average weighted mean was 4.70, indicating they are highly knowledgeable and prepared to utilize HIMS in patient care. This finding contrasts with Ngusie et al. (2022), who noted that significant efforts are often needed to enhance HIMS knowledge, suggesting that younger nurses may be more adept with such technologies compared to older groups.

Table 2. Knowledge of the Nurses in Hospital Information Management System

Indicators	WM	TR
1. Hospital Information Management System plays an essential part in every hospital.	4.90	HK
2. Healthcare professionals are adjusting to the latest technology improvements to keep their IT infrastructure high.	4.74	HK
3. Hospital Information Management System helps in Delivery of excellent quality patient care.	4.78	HK
4. Hospital Information Management	4.6	H

System Elevated integrity of data.	2	K
5. HIMS IS Easy to use and user-friendly interface	4.60	SA
6. Hospital Information Management System is designed for faster & efficient IP admission, transfer and discharge management.	4.60	HK
7. Hospital Information Management system lets you improve the productivity of the ER team.	4.66	HK
8. HIMS Improved Efficiency by avoiding human errors.	4.66	HK
9. HIMS gives Easy access to patient data with correct patient history.	4.70	HK
10. Faster IP admissions, patient transfers, real-time bed management, and quick discharge	4.64	HK
11. Hospital Information Management System helps healthcare associations to conquer any complicated difficulties they face in the current healthcare industry.	4.72	SA
12. The essential utilization of the Hospital Information Management System (HIMS) is to oversee and deal with healthcare management.	4.78	HK
13. The Health Management Information System has brought up hospital staff, patients, nurses, attendants, and doctors to add all resources and data anywhere and anytime.	4.70	HK
14. Hospital management information system, plans online appointments for specialists, and it deals with the payment records of patients.	4.74	HK
15. HIMS Further improved turnaround time required for Results and Reports.	4.72	HK
AWM	4.70	HK

Part III. Challenges Encountered by the Nurse on HIMS

The highest-rated challenges encountered by nurses included numbers 1, 3, 4, 5, 8, and 9: negative attitude towards using HIMS, lack of technical skills, security issues, data privacy issues and regulations, low internet speed, and lack of adequate nurses in the area of duty, with weighted means ranging from 4.55 to 4.90 (“Highly Encountered”). These findings align with Ahmadian et al. (2017), who reported that the most common and important challenge nurses face is the negative attitude toward using HIMS.

The lowest indicator was "duplication of data recording on paper forms and computerized forms", with a weighted mean of 3.85 (“Encountered”), indicating that nurses used to manually record their observations and nursing care given to their patients in addition to having it stored in their computer files. Because of the advent of technology, nurses must also be adept at using new technology in patient care.

Overall, the challenges received a weighted mean of 4.59 (“Highly Encountered”), suggesting significant difficulties in HIMS use. According to Mangukiya, 2024, with the use of HIMS, hospitals face obstacles to solutions such as information security risks, communication and interoperability issues, user adoption barriers, adaptability issues, and staff preparing requirements. Overcoming these obstacles is fundamental to integrate and utilize these solutions effectively.

Table 3. Challenges encountered by nurses on HIMS

Indicators	WM	TR
I ……. 1. have negative attitude towards using HIMS.	4.90	HE
2. lack knowledge and training for the comprehensive use of the system.	4.35	E
3. lack technical skills or experience in the use of the system	4.90	HE
4. am aware of security issues that often deal with confidential and sensitive patient health data	4.90	HE
5. need to deal with data privacy and regulations	4.80	HE
6. have problems on operational functionality, maintenance & support, usage problems, and quality problems	4.45	E
7. Encounter duplication of data recording on paper forms and computerized forms	3.85	E
8.experienced low speed of internet in the health facility	4.55	HE

9. encounter shortage of nurses in the area of duty	4.85	HE
10. lack motivation for learning HIMS applications	4.30	E
Average Weighted Mean	4.59	HE

Part IV. Results on the Difference in the Perceived Knowledge and Challenges of the Nurses in Hospital Management System

The analysis of variance showed no significant results, hence the acceptance of the null hypothesis that there is no significant difference in the perceived knowledge and challenges of nurses in the hospital management system across age groups. This indicates that age does not influence nurses' knowledge and challenges in using the system and that they continue to perform their duties effectively despite technological innovations.

Similarly, the computed t-values for both knowledge and challenges provided significance values higher than the set .05 level of significance, confirming the null hypothesis. Thus, male and female nurses demonstrate similar levels of knowledge and challenges in HIMS usage. Although Alrasheeday et al. (2023) found that male nurses showed a more positive attitude toward electronic health records compared to females, the current study suggests no significant gender differences in knowledge and challenges.

When comparing single and married nurses, the mean differences were also found to be not significant, as indicated by t-values and significance values greater than .05. This result shows that marital status does not influence nurses' knowledge and challenges regarding HIMS. As cited by Pandey et al. (2019), unmarried individuals have reduced access to resources that may affect utilization compared to those who are married and may engage in riskier health-related behaviors, possibly impacting utilization. Previous research suggests that being married is predictive of better health status, perhaps attributable to more effective patterns of utilization.

Furthermore, the analysis revealed that monthly family income does not impact perceived knowledge or challenges, as shown by non-significant F-values. Regardless of income level, nurses maintain similar competencies and face similar challenges with HIMS. According to Choi (2014), nursing care is a major operating cost within a hospital budget. Nursing management is important for cost savings and contributes to the financial stability of hospitals.

Educational attainment also showed no significant effect on nurses' knowledge and challenges, with computed F-values exceeding the .05 significance level. This suggests that nurses, regardless of their highest educational qualifications, perceive their knowledge and challenges in HIMS similarly.

Position within the hospital was likewise not a differentiating factor. Nurses at different levels of responsibility exhibited comparable knowledge and challenges related to the hospital information management system. Sinha and Joy (2022) found that over 70% of nurses demonstrated good computer skills and knowledge of information systems, supporting this result.

Employment status did not significantly affect nurses' knowledge or challenges with HIMS. It implies that regardless of their status in the hospital, they have knowledge of HIMS. Barzekar et al. (2019) noted that management support and perceived usefulness, rather than employment status, influence hospital information system adoption.

The workplace assignment (e.g., ward, ICU, outpatient) also did not result in significant differences. Nurses showed consistent knowledge and challenges across different units, aligning with Azim et al. (2019), who highlighted that a Health Management Information System (HMIS) standardizes data collection and decision-making across levels.

The number of related trainings attended by nurses was another factor analyzed, and results again showed no significant difference. Nurses' knowledge and challenges with HIMS appeared consistent regardless of the amount of training, aligning with the study by Ahamdian et al. (2017), who cited issues like security and lack of user training as general barriers to information system adoption in the healthcare sector.

Lastly, length of service in the nursing profession did not influence perceived knowledge or challenges. Thus, both experienced and less experienced nurses reported similar competencies and struggles with the hospital information management system.

Part V. Relationship Between the Perceived Knowledge and Challenges of the Nurses on Hospital Information Management System and their Profile Variables

All the computed R-values generated significance values higher than the set .05 level of significance. Data analysis suggests that the relationships are not significant. Therefore, the perceived knowledge of the nurses of the hospital management system is not significantly related to any of the profile variables of the nurses being considered. Also, the extent of challenges of the hospital management system is not significantly related to all the profile variables under consideration. Results showed that their profile variables, knowledge, and challenges are unrelated to their knowledge and challenges. Barzekar et al. (2019) cited that understanding the knowledge and willingness of nurses to implement new information technology is critical since they are the largest group of end users of the system, and their ability in clinical decisions is an important factor influencing the quality of care.

Table 4. Relationship Between the Perceived Knowledge and Challenges of the Nurses on Hospital Information Management System and their Profile Variables

Profile Variable	Knowledge		Challenges	
	r-value	sig	r-value	sig
Age	-.037	.798	-.105	.468
Gender	.058	.688	.168	.244
Civil Status	.087	.549	-.051	.724
Monthly Family Income	-.018	.900	.006	.968
Highest Educational Attainment	-.144	.318	-.046	.749
Position	.057	.695	.156	.278
Employment Status	-.009	.949	-.200	.163
Workplace or Department	-.226	.114	-.128	.376
Number of Related Trainings	-.054	.710	-.007	.960
Number of Years in Nursing Service	.050	.728	-.020	.889

*Significant at .05 level

IV. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following are hereby concluded:

The nurse respondents were young adults, female-dominated, unmarried, earning above-average income, holding a Bachelor's degree, staff nurses from different areas of the hospital, but most of the nurses from the ER had attended few trainings and been in the service for a few years.

On the knowledge of the nurses on the Hospital Information Management Systems, the nurses perceived to be highly aware with the use of the technology in patient care.

The nurses encountered various challenges in using the hospital information management system, particularly the lack of skills, negative attitudes, and security issues related to its use.

There were no significant differences noted in all the profile variables. It means the nurses' profiles did not affect their knowledge of the hospital management system.

There was no significant relationship found in all profile variables. The knowledge of nurses in the hospital management system is not significantly related to any of the profile variables.

The proposed development program is suggested.

Based on the conclusions formulated, the following recommendations are hereby offered:

The nurses must undergo related training on HIMS and must pursue post-graduate courses for them to be abreast with the trends in hospital information management system

The nurses must continuously utilize the use of the HIMS in their own workplace to have the expertise in the application in patient care.

The nurses must undergo training in information management to stay abreast of its use and deliver patient care services more efficiently and effectively.

The nurses must continuously upgrade their computer literacy to maximize the utilization of the HIMS. Training must be proposed and conducted for them.

The nurses must continue to challenge themselves regarding using HIMS in patient care.

The proposed program may be adapted to improve patient care services in their workplaces.

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