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FACTORS INFLUENCING NURSES' ATTITUDES TOWARDS INFORMATION TECHNOLOGY IN NURSING PRACTICE IN NEW ADVANCE COLLEGE OF NURSING AND ALLIED HEALTH SCIENCES, LAHORE

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ABSTRACT

Background: *The integration of information technology (IT) into healthcare has significantly transformed nursing practice by improving documentation, communication, and patient care outcomes. Nurses' attitudes toward IT play a vital role in the successful adoption and utilization of digital health systems. In Pakistan, limited training and infrastructural challenges may influence nurses' perceptions and effective use of information technology.*

Objective: *This study aimed to assess nurses' attitudes toward information technology in nursing practice and to examine the association between self-reported IT skills and attitudes among nursing students in Lahore, Pakistan.*

Methodology: *A descriptive cross-sectional study was conducted at New Advance College of Nursing and Allied Health Science, Lahore. A total of 133 nursing students enrolled in post-RN BSN and nursing specialization programs were selected using non-probability convenience sampling. Data were collected through a structured, self-administered questionnaire and analyzed using SPSS version 26.*

Results: *The findings indicated that most nursing students demonstrated a moderate attitude toward the integration of information technology in nursing practice. Although the majority acknowledged that IT improves patient care quality, documentation accuracy, and communication, 92.5% of participants reported having no formal training in healthcare IT. Regarding self-reported IT skills, 47.4% rated themselves as intermediate users, 30.1% as advanced users, and 22.6% as beginners. A statistically significant association was found between IT skill level and attitudes toward information technology ($\chi^2 = 12.45$, $p = 0.014$), with higher skill levels associated with more positive attitudes.*

Conclusion: *The study concludes that while nursing students recognize the importance of information technology in modern nursing practice, limited formal training and moderate skill levels may hinder positive attitudes and effective utilization. Integrating structured IT education and practical training into nursing curricula is essential to enhance nurses' technological competence and readiness for technology-driven healthcare environments.*

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INTRODUCTION

The rapid advancement of digital technology is transforming the landscape of healthcare globally, including nursing practice. Information technology is no longer a supplementary tool but an integral component of clinical decision-making, documentation, communication, and patient care delivery. With systems such as electronic health records (EHRs), bar-coded medication administration, telehealth platforms, and decision support systems, the nursing profession is increasingly dependent on digital competency and technological adaptability (Mollahoseini et al., 2021).

Despite the apparent benefits of IT integration in healthcare such as enhanced patient safety, improved efficiency, and reduced errors adoption among nurses remains uneven, especially in developing countries like Pakistan. The successful utilization of healthcare IT is strongly influenced by nurses' attitudes, which are shaped by several factors including age, prior training, experience with IT, perceived usefulness, institutional support, and accessibility of resources (Tubaishat & Aljezawi, 2021; Nwozichi et al., 2022).

While younger nurses often demonstrate greater comfort with digital technologies due to higher exposure during their academic training, older nurses may show resistance due to lower confidence or limited training opportunities. Furthermore, many nurses associate IT implementation with increased workload, decreased interpersonal interaction with patients, or fears about job displacement. Therefore, nurses' attitudes can serve as facilitators or barriers to successful technology implementation (Lee & Park, 2021).

Globally, the integration of IT in nursing practice has been recognized as essential for modern healthcare delivery. In high-income countries such as South Korea, Australia, and the United States, nurses actively use IT systems for patient documentation, care planning, and medication safety due to structured training and strong institutional support (Lee & Park, 2021).

Research in Jordan and Nigeria highlights that while nurses generally recognize the benefits of IT, challenges such as inadequate infrastructure, lack of training, and perceptions of increased workload hinder effective use. These studies emphasize that positive attitudes toward IT are strongly linked to environmental readiness, usability of systems, and organizational support, making it crucial to contextualize global evidence in local healthcare systems (Tubaishat & Aljezawi, 2021; Nwozichi et al., 2022).

In the context of Pakistan, healthcare IT adoption is still in its nascent stages, especially in public hospitals. Nurses often lack dedicated terminals, system access, or any form of standardized electronic documentation. A study by Nasir and Khalid (2023) revealed that while nurses acknowledged the potential of IT to improve care quality, their actual use was minimal due to insufficient resources and training. Policy-level neglect of nursing informatics has also been reported as a key gap.

In Pakistan, the adoption of IT in healthcare remains in its early stages, particularly in public hospitals. While private institutions in metropolitan areas have begun adopting electronic health systems, the pace of integration is slow due to limited resources, staff shortages, and insufficient policy-level prioritization of nursing informatics (Farooq et al., 2021). Studies reveal that many nurses lack confidence in using IT tools, with only a minority receiving formal training during their academic or professional careers (Alam & Naseem, 2022). Additionally, infrastructural barriers such as unreliable internet connectivity and limited access to computers hinder smooth implementation. This national context highlights the urgent need for research to understand how nurses perceive implementation, how nurses perceive IT and what factors encourage or obstruct their adoption of digital systems.

The current study aims to investigate the factors influencing nurses' attitudes toward IT in clinical settings in Lahore. By replicating and adapting the framework of a previous study conducted in Western Australia, this research addresses a critical gap in local literature and aims to inform policy, training initiatives, and resource allocation for optimal IT integration in nursing practice across Pakistan.

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OBJECTIVES

- To assess registered nurses' attitudes towards information technology in nursing students.

METHODOLOGY

A descriptive, cross-sectional research study design was used and the study was conducted in New Advance College of Nursing and Allied Health Sciences, Lahore, Pakistan. Study population was 200 nursing students Post RN BSN and specialization students. A sample of 133 was calculated using Slovin's formula and non-probability convenience sampling technique was used to recruit study participants. All Registered male and female nurses, nurses studying in Post RN BSN and nursing specialization programs, and nurses currently enrolled at New Advance College of Nursing and Allied Health Sciences were included in the study.

Data was collected using a structured, self-administered questionnaire adapted from (Veronica, S. D et. al. 2014). The tool consisted of demographic information including age, gender, qualification, and marital status along with 21 Likert-scale questions assessing nurses' attitudes toward IT use in clinical settings (responses range from Strongly Disagree to Strongly Agree).

Before collection of data from actual target group a pilot study was conducted to verify the reliability and validity of research tool. 15 copies of questionnaire which was about 10 % of total sample were distributed to 7 nursing students. Subjects were chosen on the basis of non-probability purposive sampling technique. After taking the consent from subject's data was collected. Tool reliability and validity was checked by using Cronbach's alpha which showed internal consistency of 0.8.

After pilot study, the data was collected from study participants and was entered on SPSS. To summarize the demographic characteristics of the participants, descriptive statistics such as frequencies, percentages, and means were utilized. A p-value of less than 0.05 was considered statistically significant throughout the analysis.

RESULTS

Demographic Information of Participants

Table 1 shows the demographic characteristics of the study participants. From the sample of 133 subjects, 28 nurses were from age group of 18-25 years and 31 nurses were from the age group of 36-45. Only 13 subjects were selected from the age group of 46 and above. The majority of respondents (n=61) were between the ages of 26 and 35. Regarding gender, the majority of the study respondents (n=111) were female. Post RN BSN students (n=67) and specialized students (n=66) made up nearly equal parts of the sample. The distribution of subjects according to their professional experience showed that 37 nurses reported 1-3 years of clinical experience, 41 nurses reported 4-6 years, 31 nurses reported 7-10 years, and 24 nurses reported more than ten years.

The distribution of subjects according to current work setting showed that 54 nurses worked in public hospitals, 9 worked in alternative healthcare settings, 30 were employed in teaching hospitals, and 40 nurses worked in private hospitals. Only a small percentage of individuals (n=10, 7.5%) had formal training in healthcare information technology. 123 nurses (92.5%) reported not having received any formal training in healthcare IT. In respond to the question of self-reported IT skill, 40 nurses (30.1%) ranked themselves as advanced users, 63 nurses (47.4%) as intermediate users, and 30 nurses (22.6%) as novice.

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Table 1: Demographic Characteristics of the Study Participants

Variables	Categories	Frequency (%age)
Age (in years)	18-25	28
	26-35	61
	36-45	31
	46 & above	13
Gender	Male	22
	Female	111
Qualification	Post RN BSN	67
	Specialization	66
Experience (in years)	1-3	37
	4-6	41
	7-10	31
	More than 10	24
Hospital Setting	Public	54
	Private	40
	Teaching	30
	Other	9
Training in IT	Yes	10
	No	123
Self-rated IT Level Skill	Beginner	30
	Intermediate	63
	Advanced	40

SECTION – II

Table 2 shows nursing students' attitude towards information technology. The findings from this survey of 133 nursing students reveal an overwhelmingly positive perception of information technology's role in nursing practice. Across almost all items measuring direct benefits of IT, the majority of respondents expressed agreement or strong agreement. Notably, questions assessing the perceived necessity and overall attitude toward IT integration received the highest endorsement, with 89% (Question 8) and 81.6% (Question 20) of respondents agreeing that IT is necessary for 21st-century nursing and expressing a positive overall attitude. Similarly, strong majorities recognized IT's contributions to patient care quality (81.6%), time savings in information retrieval (75%), communication improvement (68.4%), and patient confidentiality (72.8%). The willingness to use IT more with proper support and training was particularly striking, with 91.2% of respondents agreeing. Furthermore, the high motivation to improve IT skills (86.7%) and recognition of IT's positive impact on professional image (75%).

However, the results also reveal important challenges and areas requiring institutional attention. Despite generally positive attitudes, only 60.2% of respondents felt confident using IT systems in their nursing practice, while 75% agreed that lack of training limits their effective use of IT. This training deficit is further reflected in the mixed responses regarding organizational support, where only 42.6% felt their workplace provided adequate IT learning support, and nearly 30% reported insufficient access to IT resources. Interestingly, respondents largely disagreed (66.2%) that IT increases their workload, contradicting common concerns about technology adding burden, and overwhelmingly rejected the notion that IT threatens job security (66.2%), suggesting that nursing students view IT as an enabling tool rather than a threat.

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Table 2: Distribution of Participants Based on their Responses to Attitudes towards IT

Question/Item	SA n (%)	A n (%)	N n (%)	DA n (%)	SDA n (%)
1. IT improves the quality of patient care.	41 (30.1%)	70 (51.5%)	18 (13.2%)	5 (3.7%)	2 (1.5%)
2. IT helps nurses save time when retrieving patient information.	34 (25.0%)	68 (50.0%)	20 (14.7%)	10 (7.4%)	4 (2.9%)
3. IT improves communication between healthcare team members.	31 (22.8%)	62 (45.6%)	28 (20.6%)	12 (8.8%)	3 (2.2%)
4. I feel confident using IT systems in my nursing practice.	24 (17.6%)	58 (42.6%)	28 (20.6%)	20 (14.7%)	6 (4.4%)
5. Lack of training limits my effective use of IT.	37 (27.2%)	65 (47.8%)	25 (18.4%)	8 (5.9%)	1 (0.7%)
6. Using IT systems increases my workload.	9 (6.6%)	30 (22.1%)	42 (30.9%)	40 (29.4%)	15 (11.0%)
7. IT enhances patient confidentiality and data accuracy.	30 (22.1%)	69 (50.7%)	25 (18.4%)	10 (7.4%)	2 (1.5%)
8. IT is necessary for nursing in the 21st century.	51 (37.5%)	70 (51.5%)	12 (8.8%)	3 (2.2%)	0 (0%)
9. IT reduces face-to-face interaction between nurses and patients.	8 (5.9%)	25 (18.4%)	45 (33.1%)	40 (29.4%)	18 (13.2%)
10. I am motivated to improve my IT skills through training.	46 (33.8%)	72 (52.9%)	14 (10.3%)	3 (2.2%)	1 (0.7%)
11. IT increases job satisfaction among nurses.	19 (14.0%)	66 (48.5%)	32 (23.5%)	15 (11.0%)	4 (2.9%)
12. Older nurses are less likely to adapt to IT than younger nurses.	15 (11.0%)	45 (33.1%)	45 (33.1%)	25 (18.4%)	6 (4.4%)
13. I feel that IT contributes positively to my professional image.	34 (25.0%)	68 (50.0%)	24 (17.6%)	9 (6.6%)	1 (0.7%)
14. Using IT in nursing education improves student learning and engagement.	46 (33.8%)	67 (49.3%)	18 (13.2%)	5 (3.7%)	0 (0%)
15. My organization provides adequate support for learning and using IT tools.	18 (13.2%)	40 (29.4%)	40 (29.4%)	30 (22.1%)	8 (5.9%)
16. I am willing to use IT more if proper support and training are provided.	56 (41.2%)	68 (50.0%)	10 (7.4%)	2 (1.5%)	0 (0%)
17. IT reduces paperwork and improves documentation accuracy.	35 (25.7%)	70 (51.5%)	22 (16.2%)	8 (5.9%)	1 (0.7%)
18. IT threatens the job security of nurses.	2 (1.5%)	12 (8.8%)	32 (23.5%)	60 (44.1%)	30 (22.1%)
19. I have sufficient access to IT resources at my workplace.	23 (16.9%)	70 (51.5%)	28 (20.6%)	12 (8.8%)	3 (2.2%)
20. Overall, I have a positive attitude toward the integration of IT in nursing practice.	41 (30.1%)	70 (51.5%)	18 (13.2%)	6 (4.4%)	1 (0.7%)

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DISCUSSION

According to the study's findings, nursing students' opinions regarding the use of information technology in nursing practice may be influenced by their demographics. variances in learning experiences and confidence levels when using digital technology may be influenced by differences in age, gender, and educational background. Similar findings from earlier study by Adam, D., et al. (2023) have shown that demographic diversity might affect professional attitudes and preparedness, pointing to the necessity of inclusive and adaptable teaching strategies that cater to different student needs.

The study's significant finding was that nursing students lacked proper IT training. Over 90% of participants said they had never received formal instruction on the use of information technology in nursing practice. This finding highlights a critical gap in nursing education, where technological competencies are increasingly required in clinical environments. Similar findings have been reported in previous study conducted by Bester, P., et al. (2021) among nursing students, which identified insufficient formal training as a major barrier to effective use of information technology in nursing practice.

Regarding self-reported information technology skills, most participants rated their IT skills at an intermediate level. According to this research, students may have minimal computer literacy, but their ability to use technology in clinical settings may be limited. It has been highlighted in earlier studies by Schmidt, J. J., et al. (2025) that general technological familiarity does not always translate into proficiency in applications unique to the healthcare industry.

Additionally, the current survey showed that the majority of nursing students had moderate views regarding the use of IT in nursing practice. This suggests neither intense opposition nor a great desire to employ technology. Moderate attitudes could be a reflection of uncertainty brought on by insufficient training and exposure. Similar results have been seen in other research Costello, E., et al., (2024), indicating that students frequently understand the value of technology in healthcare but feel unprepared to use it efficiently. Students' attitudes may improve if instructional support is improved and technology is more often included into the nursing curriculum.

The present study identified a significant association between self-reported information technology skills and attitudes toward information technology in nursing practice. This finding is supported by previous research by Blanton, J. E., et al., (2022) showing that professional attitudes are significantly shaped by skill development. However, this relationship may be influenced by multiple factors, including educational support, access to resources, and opportunities for practice. The association observed in this study highlights the importance of addressing both skill acquisition and attitude development simultaneously within nursing education.

Overall, the findings of this study highlight the importance of integrating structured information technology education into nursing programs. Emphasis should be placed on both theoretical understanding and practical application of digital tools relevant to nursing practice. Addressing demographic diversity, enhancing formal training, and strengthening skill development may reduce existing barriers and improve students' readiness to engage with technology-driven healthcare systems. These educational improvements may ultimately contribute to improved quality of nursing care and better patient outcomes.

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