Advances In Medical Informatics (ISSN 2819-8298) https://aimi.quantechquest.com
2025; 1: 4 https://doi.org/10.22034/AIMI.2025.9.4 Open Access

The effect of improvement of nursing services and information technology courses: Perspective of nursing and midwifery students

Negin Esmaeili[1], Azam Kheirdoust[2], Kosar Ghaddaripouri[3], Seyed Ali Fatemi Aghda[4,5], Hossein Molazemian[1], Mohammad Reza Mazaheri Habibi[1,*]

[1]Department of Health Information Technology, Varastegan Institute for Medical Sciences, Mashhad, Iran
[2]Department of Medical Informatics, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
[3]Department of Health Information Management, School of Health Management and Information Sciences, Shiraz University of Medical Sciences, Shiraz, Iran
[4]Student Research and Technology Committee, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran.
[5]Research Center for Health Technology Assessment and Medical Informatics, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Article Info

Article type:
Research

Article History:
Received: 2025-04-10
Accepted: 2025-05-05
Published: 2025-05-13

**** Corresponding author:***
Mohammad Reza Mazaheri Habibi

Department of Health Information Technology, Varastegan Institute for Medical Sciences, Mashhad, Iran

Email:Mazaherim@Varastegan.ac.ir

Keywords:
Information Technology
Education
Nursing School
Midwifery
Curriculum
Health Policy

A B S T R A C T

Introduction: Considering the changes in the health system and the use of information technology in health in the world, especially in developing countries, and the electronification of patients' medical records, it seems necessary to compile information technology courses in the curriculum and accurately record information. The purpose of this study was to investigate the role of information technology courses during the internship from the point of view of nursing and midwifery students in Mashhad.

Material and Methods: This descriptive cross-sectional study was conducted on nursing and midwifery students during their internship by a researcher-made questionnaire in 2023. The validity of the questionnaire was tested by faculty members and its reliability was (Cronbach's alpha= 94%). This questionnaire contained 22 items, including how to teach information technology (5 questions), the effectiveness of this course in the workplace (11 questions), and plans for future use (6 questions). The available sampling method was used. Descriptive statistics were used to analyze the data.

Results: In total, 216 participants including 75% women and 25% men answered this questionnaire. The majority of students stated that the information technology course was presented practically and the contents taught in this course were on the topics of the Ministry of Health.

Conclusion: According to the results, it seems that there is a need to provide a more practical information technology course for nursing and midwifery students. As well as more units should be allocated so that nurses and midwives can skillfully use electronic information sources and accurately record information.

Cite this paper as:
Esmaeili N, Kheirdoust A, Ghaddaripouri K, Fatemi Aghda SA, Molazemian H, Mazaheri Habibi MR. The effect of improvement of nursing services and information technology courses: Perspective of nursing and midwifery students. Adv Med Inform. 2025; 1: 4.

INTRODUCTION

To respond to the information needs of medical and paramedical science specialists with technological advances in the field of information, the desire to use information technology (IT) has increased for specialists in this field to be aware of current scientific information and solve clinical problems, treatment, education and research [1]. The application of information technology in the health system has significant advantages for the professionals providing health services, including increasing access to information and up-to-date resources of medical sciences [2]. Today, healthcare organizations around the world have implemented information technology to improve effectiveness, efficiency, and patient safety [3-6]. On the other hand, not having a specific purpose for using new technology, satisfaction with the apparent entry of technologies, and insufficient recognition of the

Copyright© 2025 Mohammad Reza Mazaheri Habibi, Published by Advances in Medical Informatics. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International (CC BY) License (http://creativecommons.org/).

capabilities of information technology are mentioned as its weaknesses [7, 8]. Nursing and midwifery play one of the most important roles in all health care that is affected by information technology [9]. Information technology supports traditional and advanced nursing and midwifery practices in all fields [10]. Care and technology should be used to help manage actions and process nursing and midwifery data [11].

In addition, digitalization has led to the development of methods that provide opportunities for nurses to monitor patients at home [12-14]. The review of studies showed that factors such as the impracticality of nursing research, not having enough time, and the lack of support from the healthcare organization were the main obstacles to not using up-to-date information sources among nurses [15, 16].

Furthermore, studies in the field of education showed that nursing students in developing countries still lack the necessary training to use new information systems to access the required information and in general information literacy training [17].

In nursing and midwifery education, information technology education is included in the curriculum of these students to empower the students of these two fields. Some studies reported that the use of computer information resources will increase with the increase of nurses' computer skills [18]. Considering the changes in the field of nursing, it is expected that the ability of nursing and midwifery students has increased in accessing the best clinical information and the opportunity to use research-based information in clinical decisions. Therefore, the purpose of this study is to investigate the role of the information technology course during the internship from the point of view of nursing and midwifery students in Mashhad.

MATERIAL AND METHODS

Study design and participants

This descriptive cross-sectional study was conducted in 2023. After the description of the research, the participants entered the study with informed consent. All people's information has been used anonymously and confidentially.

Data collection instruments

A questionnaire was designed by the research team of this study to investigate the role of the information technology course during the internship from the point of view of nursing and midwifery students. First, a questionnaire was designed containing two columns, the first column containing the names of the information elements and the second column the degree of importance of each information element based on a five-point Likert scale (1 to 5); Scale 1 indicates very high importance, scale 2 indicates high importance, scale 3 indicates moderate importance, scale 4 indicates low importance, and scale 5 indicates very low importance .The face validity of the questionnaire was tested by 9 faculty members of Varastegan institute for medical sciences, and its reliability was measured using the test-retest method (Cronbach's alpha=0.94). This questionnaire contained 22 questions including how to teach information technology (5 questions), the effectiveness of this course in the workplace (11 questions), and plans for future use (6 questions). This questionnaire was designed electronically and sent to the participants.

Intervention

This study was conducted among nursing and midwifery students of Mashhad Medical Sciences. Initially, an advertisement was sent to all nursing and midwifery students, and they were invited to participate in the study by stating the goals and objectives of the study. They were asked to give their consent if they were willing to participate in the research. This stage lasted for 2 weeks. Then, 216 participants were randomly selected among the volunteers, and an online meeting was held to clarify the research goals and work steps, and the questions and ambiguities of the individuals were answered. Then, after receiving the participants' consent, an electronic questionnaire was sent to them and they were asked to answer all the questions in the questionnaire and send it to us within a maximum of 1 month. After receiving all the questionnaires, statistical analysis was performed.

Data analysis

Data were entered in SPSS version 19 software. Standard deviation and mean were used to describe continuous variables, and percentage and frequency were used to analyze descriptive data.

RESULTS

A total of 216 participants responded to this questionnaire (response rate: 100%), which included 162 women and 54 men. According to Table 1, the majority of students stated that the information technology course was presented practically and the contents taught in this course were on the topics of the Ministry of Health. Moreover, more than half of the students stated that the material presented in this course was useful (61%) and the professor's teaching method was satisfactory (59%). Almost half of the people believed that this lesson is useful in other subjects as well (52%). According to Table 2, the majority of students stated that the information technology course was necessary during the internship (65%) and the material taught in this

course was used (61%).

In addition, 125 people believed that information technology knowledge is effective for working in medical centers, and 181 people believed that this course is useful in completing cases effectively. 162 people also stated that this course has improved their IT knowledge (75%). In general, 149 people expressed their satisfaction with the presentation of this course (69%) and almost half of the people believed that this course made them interested in IT.

Table 3 includes the opinions and views of the students of these two majors regarding the improvement of IT teaching in the future. A small number of students believed that the number of theory units in this course should be increased (31%), while the majority of people believed that the number of practical units in this course should be increased (72%). According to Table 3, 102 people felt the need to increase computer skills, 158 people felt the need to increase information technology skills, and 123 people felt the need to participate in the workshop. Finally, a significant number of Students said that increasing their IT skills would improve their job status (77%).

Table 1: The results of examining the views of nursing and midwifery students regarding the teaching of information technology during the period of study

Questions	Very High n (%)	High n (%)	Medium n (%)	Low n (%)	Very Low n (%)
The information technology course is presented in a practical way	2 (1)	39 (18)	123 (57)	43 (20)	9 (4)
The material taught in this lesson was according to the Ministry of Health's heading.	59 (27)	97 (45)	54 (25)	6 (3)	0 (0)
The material taught in this lesson has been useful for me.	48 (22)	84 (39)	65 (30)	15 (7)	4 (2)
In my opinion, the professor's teaching method was satisfactory.	52 (24)	76 (35)	69 (32)	17 (8)	2 (1)
In my opinion, the information technology course was used in other courses.	34 (16)	78 (36)	76 (35)	19 (9)	9 (4)

Table 2: The results of examining the views of nursing and midwifery students regarding the effectiveness of the information technology course during the academic period

Questions	Very High n (%)	High n (%)	Medium n (%)	Low n (%)	Very Low n (%)
From my point of view, the IT course is necessary during my studies.	63 (29)	78 (36)	13 (6)	60 (28)	2 (1)
The material taught in this lesson has been used during homework.	61 (28)	71 (33)	61 (28)	19 (9)	4 (2)
In my opinion, having information technology knowledge is effective for working in medical centers.	45 (21)	80 (37)	72 (33)	15 (7)	4 (2)
In my opinion, the information technology course is used in the effective completion of cases.	114 (53)	67 (31)	32 (15)	2 (1)	0 (0)
In this lesson, my teacher had the necessary knowledge in the field of information technology.	63 (29)	69 (32)	69 (32)	13 (6)	2 (1)
In this lesson, my teacher was aware of the use of information technology in treatment centers.	89 (41)	73 (34)	48 (22)	4 (2)	4 (2)
In this course, my professor had the experience of providing midwifery and nursing services in medical centers.	114 (53)	65 (30)	28 (13)	9 (4)	0 (0)
The IT course improved my computer knowledge.	48 (22)	50 (23)	76 (35)	25 (12)	17 (8)
The IT course improved my IT knowledge.	104 (48)	58 (27)	39 (18)	13 (6)	2 (1)
In general, I am satisfied with the presentation of this lesson.	86 (40)	63 (29)	54 (25)	6 (3)	6 (3)
This course made me interested in information technology.	47 (22)	63 (29)	69 (32)	22 (10)	15 (7)

Table 3: The results of examining the opinions of nursing and midwifery students regarding the improvement of health information technology teaching in the future.

Questions	Very High n (%)	High n (%)	Medium n (%)	Low n (%)	Very Low n (%)
In my opinion, the number of theory units in this course should be increased.	30 (14)	37 (17)	60 (28)	35 (16)	54 (25)
In my opinion, the number of practical units in this course should be increased.	125 (58)	30 (14)	41 (19)	11 (5)	9 (4)
Passing this course made me feel the need to increase my computer skills.	57 (26)	45 (21)	58 (27)	30 (14)	26 (12)
Passing this course made me feel the need to increase my IT skills.	119 (55)	39 (18)	43 (20)	11 (5)	4 (2)
Passing this lesson made me feel the need to participate in the workshop.	67 (31)	56 (26)	61 (28)	15 (7)	17 (8)
I believe that increasing my information technology skills will improve my job status.	121 (56)	45 (21)	41 (19)	0 (0)	9 (4)

DISCUSSION

Considering the electronification of patient records in hospitals and the importance of accurate information recording by medical staff, if there is an effective role of information technology course during internship, it is necessary to present this course more practical and applicable way for nursing and midwifery students. Moreover, to improve the IT skills of nursing and midwifery students, there is a need to revise this lesson in the educational curriculum. Therefore, this study was conducted to investigate the role of information technology courses during the internship from the point of view of nursing and midwifery students in Mashhad. The findings of the current research showed that 47% of students much and very much need to increase their computer skills, 73% of people much and very much need to increase their information technology skills, and also 57% of the participants need much and very much to attend in the workshop. In this regard, in a study conducted by Eley et al. to investigate the current knowledge and future educational requirements of nurses in the field of IT and computers, almost half of the participants stated that to better meet the needs of IT and computers, need more training in their jobs [19]. Likewise, another study aimed at investigating nurses' perceptions of the use of computer technology and understanding the meaning of this technological change in nurses' work was conducted by Tsarfati et al. They stated that since nurses are the first line of treatment in emergencies, Therefore, there is a need for sustainable education and tools for identification and treatment to become part of the curriculum of future nurses [20]. Besides, 61% of the participants stated very much that the material taught in this course was used during their internship. In that case, in another study conducted by Eley et al. to determine the current use of IT by nurses and its obstacles, they stated that 86% of the respondents used computers at work [21]. In addition, this study showed that the majority of people are very satisfied with the presentation of this course (69%).

Similarly, in a study conducted by Singh et al. to investigate nursing students' views on the use of IT in nursing education, most people had a positive attitude towards IT [22]. In a study conducted by Zayim et al., nursing students also showed positive opinions about IT [23]. This study provides valuable insights regarding the existing need for the application of information technology courses during internships at universities and educational centers. However, this study had some limitations. First, since students choose to enter the study based on their own will, there may be bias in the selection of samples. Additionally, considering that this study was conducted only among undergraduate students, as a result, the number of available samples was limited. According to the profession of nurses and midwives and their high workload, face-to-face training is undoubtedly challenging for them. Within this context, previous studies have proven the effectiveness of technology-based education, including the use of virtual reality technology, artificial intelligence, and telemedicine, due to its comprehensive and easy access, and cost-effectiveness [24-32]. Due to the increasing growth of digital technology, more studies are suggested for the effect of using other technologies, including simulation-based learning and its application in nursing education.

CONCLUSION

According to the results of the present study, it seems that there is a need to present the information technology course more practical and applicable way for nursing and midwifery students, and there is also a need for the practical presentation of the information technology course by most of the respondents (72%). In addition, the results indicate that the presentation of this course is very prominent in acquiring the skill of completing the patient's

record. 73% of the answers were about paying more attention to this subject in the educational curriculum and assigning more units due to its high applicability during the internship.

ACKNOWLEDGEMENT

We hereby express our gratitude to the Varastegan Institute for Medical Sciences who helped us in conducting this research.

AUTHOR'S CONTRIBUTION

NE: Conceptualization, data curation, investigation, writing the original draft, review and editing; AK: Formal analysis, methodology, validation, writing the original draft; KG: Formal analysis, methodology, software, writing the original draft; SAFA: Conceptualization, data curation, supervision, writing the original draft, review and editing; HM: Resources, visualization, writing the original draft; MRMH: Conceptualization, methodology, validation, writing the original draft, review and editing.

All authors have provided final approval of the version submitted.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

ETHICAL APPROVAL

All methods were carried out in accordance with relevant guidelines and regulations. The study has been approved in ethical committee of the ethical committee of Mashhad University of Medical Sciences (approval number IR.MUMS.REC.1402.123). In this study the Informed consent was obtained from all individual participants.

FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

REFERENCES

1. Ghaffari F, Jeddi FR, Farrahi R, Nabovati E. Design, development, and evaluation of an interactive training simulator for teaching hospital information systems. J Educ Health Promot. 2021; 10: 205. PMID: 34395642 DOI: 10.4103/jehp.jehp_1006_20 [PubMed]
2. Balsalobre-Lorente D, Abbas J, He C, Pilař L, Shah SAR. Tourism, urbanization and natural resources rents matter for environmental sustainability: The leading role of AI and ICT on sustainable development goals in the digital era. Resources Policy. 2023; 82: 103445.
3. Fauziyah N, Hariyati RTS, Rachmi SF, Nopiana I. Nurse's self-efficacy in patient engagement during the COVID-19 pandemic. Jurnal Keperawatan. 2023; 14(1): 1-10.
4. Weis A, Pohlmann S. Digital technology for information and communication in healthcare. In: Wensing M, Ullrich C (eds.). Foundations of health services research: Principles, methods, and topics: Springer; 2023.
5. Sulkers H, Tajirian T, Paterson J, Mucuceanu D, MacArthur T, Strauss J, et al. Improving inpatient mental health medication safety through the process of obtaining HIMSS Stage 7: A case report. JAMIA Open. 2018; 2(1): 35-9. PMID: 31984343 DOI: 10.1093/jamiaopen/ooy044 [PubMed]
6. Strudwick G, Jeffs L, Kemp J, Sequeira L, Lo B, Shen N, et al. Identifying and adapting interventions to reduce documentation burden and improve nurses' efficiency in using electronic health record systems (The IDEA Study): Protocol for a mixed methods study. BMC Nurs. 2022; 21(1): 213. PMID: 35927701 DOI: 10.1186/s12912-022-00989-w [PubMed]
7. Al-Faouri I, Obaidat DM, AbuAlRub RF. Missed nursing care, staffing levels, job satisfaction, and intent to leave among Jordanian nurses. Nurs Forum. 2021; 56(2): 273-83. PMID: 33345335 DOI: 10.1111/nuf.12537 [PubMed]
8. Sarpourian F, Marzaleh MA, Aghda SAF, Zare Z. Application of telemedicine in the ambulance for stroke patients: A systematic review. Prehosp Disaster Med. 2023; 38(6): 774-9. PMID: 37877359 DOI: 10.1017/S1049023X23006519 [PubMed]
9. McGonigle D, Mastrian K. 5the ed. Jones & Bartlett Learning; 2024.
10. Wang J, Xu Y, Zhang X, Pan H. Ethical predicaments and countermeasures in nursing informatics. Nurs Ethics. 2024; 31(6): 1050-64. PMID: 37976551 DOI: 10.1177/09697330231215962 [PubMed]
11. O'Connor S. The next generation of nursing informaticians: The benefits of mixing mentoring models. In: Gantz NR, Hafsteinsdóttir TB (eds.). Mentoring in nursing through narrative stories across the world. Springer; 2023.
12. Anderberg P, Björling G, Stjernberg L, Bohman D. Analyzing nursing students' relation to electronic health and technology as individuals and students and in their future career (the eNursEd study): Protocol for a longitudinal study. JMIR Res Protoc. 2019; 8(10): e14643. PMID: 31573945 DOI: 10.2196/14643 [PubMed]
13. Lekalakala-Mokgele E, Lowane MP, Mogale NM. Knowledge, perceptions and attitudes of eHealth and health technology among nursing students from Gauteng province, South Africa. Healthcare (Basel). 2023; 11(12): 1672. PMID: 37372790 DOI: 10.3390/healthcare11121672 [PubMed]
14. Rouleau G, Gagnon M-P, Côté J, Payne-Gagnon J, Hudson E, Dubois C-A, et al. Effects of e-learning in a

continuing education context on nursing care: Systematic review of systematic qualitative, quantitative, and mixed-studies reviews. J Med Internet Res. 2019; 21(10): e15118. PMID: 31579016 DOI: 10.2196/15118 [PubMed]

15. Glanville D, Hutchinson A, Khaw D. Handheld computer devices to support clinical decision-making in acute nursing practice: Systematic scoping review. J Med Internet Res. 2023; 25: e39987. PMID: 36780222 DOI: 10.2196/39987 [PubMed]
16. Langarizadeh M, Rahmati P, Yousefpour Azari S, Sarpourian F, Sayadi MJ, Langarizadeh MH, et al. Identifying and validating the educational needs to develop a Celiac self-care system. BMC Prim Care. 2023; 24(1): 121. PMID: 37316859 DOI: 10.1186/s12875-023-02076-8 [PubMed]
17. Nezamzadeh M, Khaghanizadeh M. Comparative comparison of policy making in nursing education in Iran, Canada, USA and Nepal. Journal of Nursing Education. 2023; 12(1): 36-48.
18. Wynn M, Garwood-Cross L, Vasilica C, Griffiths M, Heaslip V, Phillips N. Digitizing nursing: A theoretical and holistic exploration to understand the adoption and use of digital technologies by nurses. J Adv Nurs. 2023; 79(10): 3737-47. PMID: 37530425 DOI: 10.1111/jan.15810 [PubMed]
19. Eley R, Fallon T, Soar J, Buikstra E, Hegney D. The status of training and education in information and computer technology of Australian nurses: A national survey. J Clin Nurs. 2008; 17(20): 2758-67. PMID: 18808645 DOI: 10.1111/j.1365-2702.2008.02285.x [PubMed]
20. Tsarfati B, Cojocaru D. The importance of receiving training in computerized technology for nurses to maintain sustainability in the health system. Sustainability. 2022; 14(23): 15958.
21. Eley R, Fallon T, Soar J, Buikstra E, Hegney D. Nurses' confidence and experience in using information technology. Australian Journal of Advanced Nursing. 2008; 25(3): 23-35.
22. Singh F, Masango T. Information technology in nursing education: Perspectives of student nurses. The Open Nursing Journal. 2020; 14(1): 18-28.
23. Zayim N, Ozel D. Factors affecting nursing students' readiness and perceptions toward the use of mobile technologies for learning. Comput Inform Nurs. 2015; 33(10): 456-64. PMID: 26200902 DOI: 10.1097/CIN.0000000000000172 [PubMed]
24. Ghaddaripouri K, Mousavi Baigi SF, Abbaszadeh A, Mazaheri Habibi MR. Attitude, awareness, and knowledge of telemedicine among medical students: A systematic review of cross-sectional studies. Health Sci Rep. 2023; 6(3): e1156. PMID: 36992712 DOI: 10.1002/hsr2.1156 [PubMed]
25. Ghaddaripouri K, Mousavi Baigi SFM, Noori N, Mazaheri Habibi MR. Investigating the effect of virtual reality on reducing the anxiety in children: A systematic review. Frontiers in Health Informatics. 2022; 11: 114.
26. Agha Sayed Esmaeil Amiri FS, Bohlouly F, Khoshkangin A, Razmi N, Ghaddaripouri K, Mazaheri Habibi MR. The effect of telemedicine and social media on cancer patients' self-care: A systematic review. Frontiers in Health Informatics. 2021; 10: 92.
27. Mousavi Baigi SF, Moradi F, Vasseifard F, Abadi FM, Mazaheri Habibi MR. The effect of nutrition training on knowledge of students at university of medical sciences. Topics in Clinical Nutrition. 2022; 37(3): 236-41.
28. Mousavi Baigi SF, Norouzi Aval R, Sarbaz M, Kimiafar K. Evaluation tools for digital educational games: A systematic review. Acta Medica Iranica. 2022; 60(8): 499-507.
29. Ganjali R, Khoshrounejad F, Mazaheri Habibi MR, Taherzadeh Z, Golmakani R, Mostafavi SM, et al. Effect and features of information technology-based interventions on self-management in adolescent and young adult kidney transplant recipients: A systematic review. Adolesc Health Med Ther. 2019; 10: 173-90. PMID: 31686939 DOI: 10.2147/AHMT.S200801 [PubMed]
30. Aalaei S, Amini M, Mazaheri Habibi MR, Shahraki H, Eslami S. A telemonitoring system to support CPAP therapy in patients with obstructive sleep apnea: A participatory approach in analysis, design, and evaluation. BMC Med Inform Decis Mak. 2022; 22(1): 168. PMID: 35754055 DOI: 10.1186/s12911-022-01912-8 [PubMed]
31. Khoshkangin A, Agha Sayed Esmaeil Amiri FS, Ghaddaripouri K, Noroozi N, Mazaheri Habibi MR. Investigating the role of mobile health in epilepsy management: A systematic review. J Educ Health Promot. 2023; 12: 304. PMID: 38023071 DOI: 10.4103/jehp.jehp_1188_22 [PubMed]
32. Moghbeli, F, Setoodefar M, Mazaheri Habibi MR, Abbaszadeh Z, Keikhay Moghadam H, Salari S, et al. Using mobile health in primiparous women: Effect on awareness, attitude and choice of delivery type, semi-experimental. Reprod Health. 2024; 21(1): 49. PMID: 38594731 DOI: 10.1186/s12978-024-01785-2 [PubMed]