

Impact of Educational Intervention on Knowledge of Nursing Informatics among Nursing Students

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Abstract

Introduction : Since 1984, the term "nursing informatics" has been regarded as a specialist in nursing resources, and nurses have been working in the field of informatics for nearly four decades (Guenther & Peters, 2006).

Material and Methods : Quasi-experimental one-group pretest-posttest designs were used in the study. Methods: The simple random sampling technique selected 100 nursing students at the Savitri Jindal Institute of Nursing, Haryana, India. A self-structured knowledge questionnaire (multiple choice questions) consisting of 20 items was used to collect the data, followed by educational intervention in the auditorium.

Result : The pre-test mean knowledge score was 8.56, the post-test mean knowledge score was 17.12, and the 't' value for knowledge was 21.22, indicating that there were significant changes in knowledge but no association between knowledge and demographic variables such as age (6.79), class (3.36), or source of knowledge (5.67) ($p < 0.05$).

Conclusion : The results showed that the educational intervention improved knowledge of nursing informatics among nursing students.

Keywords : Educational, Intervention, Knowledge, Nursing Informatics, Students.

Introduction

The area has expanded to include a wide range of topics, including data recovery, ethics, patient care, decision support systems, human-computer interaction, information systems, image informatics, computer science, information science, security, intelligent systems, e-learning, and telenursing.¹

Informatics is a sub-discipline of information engineering. It is an applied form of information science that involves the practice of information processing and the engineering of information systems. The field considers the interaction of humans and information, as well as the development of interfaces, organizations, technologies, and systems. As a result, informatics is a broad field with many subspecialties, including computer science, information systems, information technology, and statistics. Individuals and organizations have increasingly processed information digitally since the invention of computers.²

This has resulted in the study of informatics, which includes computational, mathematical, biological, cognitive, and social

aspects, as well as the study of the social impact of information technologies. Karl Steinbuch, a German computer scientist, coined the term Informatik in 1956 when he published a paper titled "Informatics: Automatic Information Processing."³

Healthcare information technology (HIT) has been defined as "the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making".⁴

One of the most important clinical systems is Nursing Information Systems (NIS), which enables documenting of the treatment and instruction given to the patient as well as assessment of the patient. Two NIS approaches 1. Menu-driven screens-content is presented in pre-arranged categories to help practitioners choose the elements that are most pertinent to their situation. Based on the nursing diagnosis, the categories are built around the nursing process from admission through discharge. 2. Care Protocols - Based

on the admission diagnosis, a particular protocol is chosen in this form of documentation.⁵

A new language has emerged to describe informatics and its processes; however, it is widely misunderstood. Nursing informatics helps improve vital nursing processes like documentation, which is an important aspect of the profession and essential for effective patient care. Before electronic health records (EHRs), nurses recorded patient information on charts. Today, nursing informatics simplifies documentation and automates the transmission of patient data via connected devices to provide access by nurses, physicians, and patients.⁶

Rania Ebrahim, Soheir El-Din, Nagat Habib, and Samerra Abou El Kheir (2014) set out to assess nurses' knowledge, attitude, and practise of the nursing informatics system in out-patient clinics at Cairo's Children's Cancer Hospital. According to the findings of this study, the majority of the sample was female, and more than half of them were single. Furthermore, it was discovered that more than half of them were academic faculty. Furthermore, there was a highly statistically significant difference between total nursing informatics system knowledge and total nursing informatics system attitude. This study concluded that nurses are responsible for a significant portion of the patient record and are thus disproportionately affected by computerization.⁷

Rapid advancement in ICT in those places has provided solutions to the problems in healthcare management system. These include a wide spectrum of issues such as patient safety, document management and medical education. The potential for nursing informatics to enhance nursing education and practice, study clinical problem-solving and ultimately improve the quality of care has been a long standing expectation. However, unlike many other information intensive industries, healthcare has been slow in adopting information technology. Nurses, like other healthcare professionals are yet to develop a culture to promote acceptance and use of information technologies as basic tools for information management and exchange.¹ Over the last decade, the complexity of the informatics skills required of registered nurses has increased significantly. This higher skill level indicates a need for clarification regarding current nursing informatics competencies. Nurse educators must be prepared to teach the most current informatics knowledge in order to best prepare graduates.⁸

The introduction of technology and the internet into classrooms has been the most important change in the field education in the past 100 years. Both students and educators

need time to reflect on this changing content and make the maximum advantage of IT. It is important that nurses are able to demonstrate competence in the use of IT.⁹

Hypotheses

- ▼ **H₁**: There is a significant difference in the level of knowledge of nursing informatics among nursing students between the pre-test and post-test.
- ▼ **H₂**: There is a significant association with the pre-test level of knowledge nursing informatics and selected demographic variables such as age, class, sources of knowledge among nursing students.

Methodology

Design

The study employed a quasi-experimental one-group pre-test-post-test design. The research was carried out on nursing students at the Savitri Jindal Institute of Nursing in Haryana, India. The independent variable was the educational intervention in nursing informatics. In contrast, the dependent variable was the level of knowledge in nursing informatics. Extraneous variables included age, class, and sources of knowledge.

Sample

A simple random sampling procedure was used to select 100 samples for this investigation. All nursing students studying at the Savitri Jindal Institute of Nursing in Haryana, India, and those willing to participate, met the study's inclusion criteria. Those who were unable to collect data were excluded.

Validity and Reliability

Furthermore, the reliability of the knowledge tool was analyzed by the Split-Half method, and the Spearman-Brown Prophecy formula was used. The results showed excellent reliability ($r = 0.94$).

Description of the intervention

After receiving formal permission from the Medical Superintendent of the Savitri Jindal Institute of Nursing in Haryana, India, the data was collected from November 5, 2022 to November 14, 2022. Explained the aim and procedure to the nursing students and obtained informed consent before the data collection began. The researcher distributed a self-structured questionnaire (online mode) on the first day, instructed the nursing students to fill in the demographic variables, and assessed the pre-test level of knowledge with 20 multiple-choice questions for 25 minutes. They were asked to respond honestly and completely. The

researcher reminded them that their answers would be kept confidential. The PowerPoint presentation on the future of nursing informatics was held for an hour. The following topics were covered: definition of nursing informatics, values of nursing informatics, benefits of nursing informatics, nursing skills needed related to informatics and technology, application of nursing informatics in clinical practice, nursing education, and nursing administration. On the 7th day, the researcher collected the post-test level of knowledge online for 25 minutes.

Results

In terms of demographic variables by age, the majority of them 80 (80%) were between the ages of 18 to 21, 8 (8%) were between the ages of 22 to 25, and 12 (12%) were between the ages of 25 to 28. The majority of the class consisted of 45 (45%) GNM I students, 35 (35%) of them belongs to GNM II students, and 20 (20%) of them were GNM III students. When it comes to the source of knowledge, the majority of them 65 (65%) were received from teachers, 18 (18%) of them were books, 9 (9%) of them were mass media, and 8 (08%) of them were from family and friends (figure:1).

With regards to the level of knowledge, the majority of them, 75 (83%), had inadequate knowledge, 15 (11%) had moderately adequate knowledge, and 10 (6%) had adequate knowledge in the pre-test. However, after the educational intervention, the majority of them 92 (84%) had adequate knowledge, 06 (13%) had moderately adequate knowledge and 02 (3%) had inadequate knowledge as assessed by the post-test (figure: 2).

The pre-test and post-test mean score of knowledge was (8.56), (17.12), and the standard deviation of (SD) was (3.44), (2.01). The 't' value was ($t(100) = 21.22$) indicates that there were significant changes in the knowledge ($p < 0.05$). Hence the study concluded that the educational intervention effectively gained knowledge on nursing informatics among nursing students. Therefore the H1 hypothesis was accepted. The obtained Chi-square value for the age (6.79), class (3.36), and sources of knowledge (5.67) indicate that there was no association between the above variables with the nursing informatics. Hence the H2 hypothesis was rejected.

Discussion

The aims of the study was to assess the pre and post-test level of knowledge, and impact of educational intervention on knowledge of nursing informatics among nursing students

as well as to find out the significant association between pre-test knowledge with selected demographic variables such as age, class and sources of knowledge.

I.Y. Ademuyiwa et al. (2020) conducted cross-sectional descriptive research to assess nurses' knowledge and use of nursing informatics at Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos. The respondents' average age is 350.48. The overall knowledge of nursing informatics was high among respondents, with 121.5 (75%) having good knowledge of nursing informatics and 157 (99.4%) using nursing informatics. There was no statistically significant relationship between respondents' knowledge and use of nursing informatics ($p < 0.05$) 10

Conclusion

Increasing compliance with science and health care systems requires active use of nursing informatics methods in nursing practice, education, and administration. Informatics should be taught for professional use. Additionally, informatics can be used to improve nursing success rates.

Recommendations

- ✓ Training programmes must be conducted on a regular basis to create a positive work environment in the workplace.
- ✓ Hospital management should encourage the trainees' to participate in training programmes to update their knowledge and skills so they can provide quality care.
- ✓ Nursing informatics knowledge should be evaluated by hospital administration.

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Conflicts of interest

There are no conflicts of interest to disclose.

Figure 1 Shows Source of Knowledge Regarding Nursing Informatics among Nursing Students

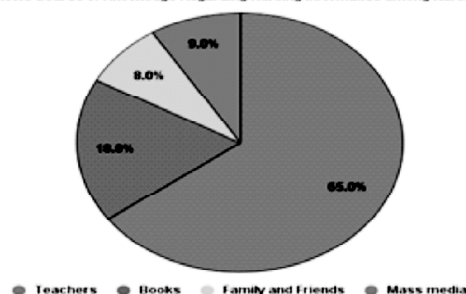
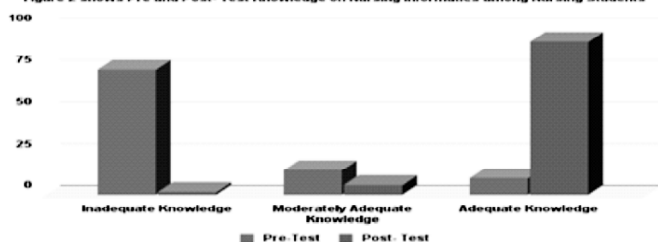


Figure 2 shows Pre and Post-Test Knowledge on Nursing Informatics among Nursing Students



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