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EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING THE IMPACT OF ARTIFICIAL INTELLIGENCE AMONG NURSING STUDENTS

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Artificial intelligence is revolutionizing the modern medical landscape by enhancing diagnostic accuracy and streamlining patient care protocols. This study was undertaken to assess the effectiveness of a structured teaching program on knowledge regarding the impact of artificial intelligence in healthcare among nursing students at a selected college in Coimbatore. Quantitative research approach with one-group pretest post-test pre-experimental design was used. The study involved a sample of 70 nursing students who were selected through a non-probability convenient sampling technique. Data collection was performed using a structured questionnaire method designed to measure specific knowledge domains of AI technology. The results were analyzed using both descriptive and analytical statistics. The data revealed a significant improvement in knowledge levels following the intervention, with an obtained 't' test value of 5.40, which was statistically significant at the 0.05 level. This indicates that the educational intervention successfully bridged the knowledge gap among the participants. In conclusion, the study findings clearly demonstrate that the structured teaching program was a highly effective strategy in improving the knowledge of nursing students regarding the impact of artificial intelligence in healthcare. Enhancing such competencies is vital for preparing the nursing workforce to navigate an increasingly tech-driven medical environment and ensures they remain at the forefront of innovative patient care.

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INTRODUCTION

The integration of artificial intelligence (AI) in Nursing, has brought significant transformation in healthcare sector. As technology advances rapidly, Nurses are expected to adapt to new tours that assist in decision making patient monitoring and clinical management. There is a growing need to understand how artificial intelligence has an impact in nursing care and professional role of nurses.

The rapid integration of Artificial Intelligence (AI) into healthcare systems is no longer a futuristic concept but a present reality, reshaping clinical workflows through predictive analytics, automated documentation, and enhanced diagnostic tools. As the primary point of contact for patient care, nurses are increasingly expected to interact with Artificial Intelligence driven technologies to improve patient safety and clinical outcomes. However, a significant gap exists between the technological advancements in hospitals and the current pedagogical frameworks in nursing education.

Without a formal understanding of how Artificial Intelligence functions and its specific impact on the nursing process, future nurses may face "technological shock" or over-reliance on automated systems, which could compromise the quality of patient-centered care.

In rapidly developing healthcare hubs, educational institutions must proactively respond to technological transformation rather than reactively adapting after workforce gaps emerge. Preparing nursing students for contemporary practice ensures smoother transition into employment and enhances institutional reputation. Assessing the effectiveness of structured teaching programme contributes to academic excellence and supports strategic planning for future educational initiatives.

Moreover, healthcare accreditation standards are progressively incorporating digital competence and informatics awareness into evaluation criteria. Educational institutions are expected to demonstrate that graduates are prepared for technologically enhanced practice environments. Conducting research on structured teaching effectiveness not only benefits students but also supports

institutional compliance with evolving professional standards.

Finally, the transition from student nurse to professional practitioner is a critical period marked by increased responsibility and accountability. If students enter clinical settings without adequate exposure to emerging technologies, adaptation may be challenging and stressful. Structured teaching programme serve as proactive measures that prepare students cognitively, emotionally, and professionally for modern healthcare realities. Therefore, assessing and enhancing knowledge through systematic educational intervention is necessary to ensure safe, competent, and future-ready nursing practice

In conclusion, the rapid advancement and integration of digital technologies within the Indian healthcare system have significantly transformed clinical practice environments, creating new expectations for nursing professionals. As healthcare institutions increasingly rely on technology-driven systems for documentation, patient monitoring, communication, and quality assurance, nurses must be adequately prepared to function competently within these modern frameworks. However, gaps in structured educational exposure may limit nursing students' readiness, confidence, and ability to effectively utilize such systems in clinical settings. Identifying existing knowledge levels and addressing deficiencies through a well-designed structured teaching programme is therefore essential to ensure safe, ethical, and efficient practice. Strengthening technological awareness during the academic phase will not only enhance professional competence but also support national healthcare modernization goals.

Hence, the present study is undertaken to assess and improve the knowledge of nursing students regarding the impact of Artificial Intelligence, thereby preparing them to meet the evolving demands of contemporary healthcare practice.

STATEMENT OF THE PROBLEM

"A STUDY TO ASSESS THE EFFECTIVENESS OF A STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE REGARDING THE IMPACT OF ARTIFICIAL INTELLIGENCE AMONG NURSING STUDENTS IN A SELECTED COLLEGE AT COIMBATORE."

OBJECTIVES

1. To assess the level of knowledge regarding the impact of Artificial

Intelligence among nursing students in a selected college at Coimbatore.

2. To evaluate the effectiveness of the structured teaching programme by comparing the pretest and post-test knowledge scores regarding the impact of Artificial Intelligence among nursing students.
3. To find out the association between the pretest level of knowledge and selected demographic variables**.**

HYPOTHESIS

H1: There will be a statistically significant difference between the pretest and post-test knowledge scores regarding the impact of Artificial Intelligence among nursing students after the administration of the structured teaching programme.

H2: There will be a statistically significant association between the pretest level of knowledge regarding the impact of Artificial Intelligence and selected demographic variables among nursing students.

METHODS AND MATERIALS

A pre-experimental with one group pre test and post test design and quantitative approach was selected to carry out the study. The study population comprised of all student nurses studying fourth year B.Sc Nursing at PPG College of Nursing at Coimbatore. The sample size for study was 70 student Nurses. Non probability, convenient sampling technique was used for selecting sample of the study. The tools used for study were structure questionnaire to assess the knowledge regarding Impact of Artificial Intelligence in health care.

Data collection was conducted with the formal permission from the Principal college of nursing and the ethical committee. Students were instructed that they will be a part of a study and the consent was obtained. Pretest was conducted to the whole group on the Day I. Level of knowledge was assessed with using a well-structured multiple-choice questionnaire consisting of 20 questions, with a maximum possible score of 20. Each correct answer was awarded one point, while incorrect responses received a score of zero.

The tool was developed by the investigator based on an extensive review of relevant literature and aligned with the objectives of the study. It was created under the guidance of subject matter experts and subsequently reviewed and approved by the research committee. The
content validity of the tool was established through evaluation by experts in medical-surgical nursing.

On the seventh day, post test was conducted with the same tools. The collected data were tabulated and analyzed using

descriptive and inferential statistics. Tests used in this study were frequency and percentage distribution, mean, standard deviation, chi square test, and Paired‘t’ test.

RESULTS

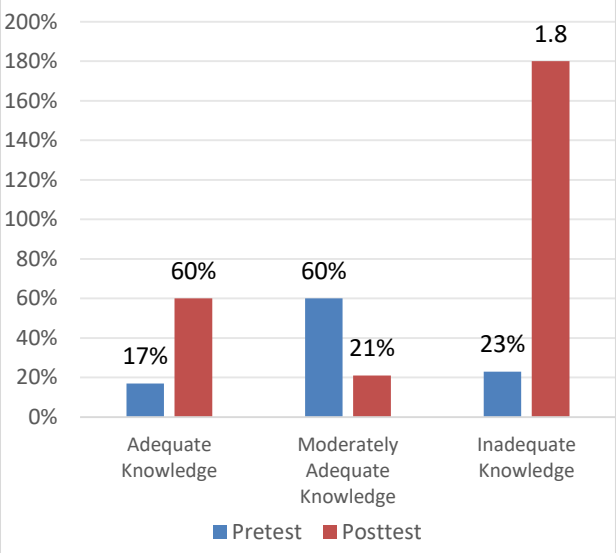
SECTION-A : DISTRIBUTION OF THE DEMOGRAPHIC VARIABLES

The present study included a total of 70 participants. Regarding age distribution, the majority of the respondents 61 (87%) were between 21–22 years, while 9 (13%) were above 22 years, and none were below 20 years. In terms of gender, most of the participants were female 59 (84%), whereas 11 (16%) were male. With respect to the education of the breadwinner of the family, nearly half 33 (47%) had higher education, 19 (27%) had primary education, 17 (24%) had secondary education, and only 1 (2%) was illiterate.

Regarding the type of family, the majority 54 (77%) belonged to nuclear families, while 16 (23%) were from joint families. In relation to the number of siblings, 45 (64%) had one sibling, 21 (30%) had two siblings, and 4 (6%) had three or more siblings. Considering place of residence, 42 (60%) were from urban areas and 28 (40%) were from rural areas. The previous exposure to any teaching methods regarding Artificial intelligence, participants had 46 (66%) whereas 24 (34%) had no prior exposure.Finally, 46 (66%) of the participants had Previous exposure to any teaching methods regarding impact of artificial intelligence on health care, whereas 24 (34%) had no prior education.

SECTION –B : DISTRIBUTION OF THE PRETEST AND POST TEST SCORE BASED ON LEVEL OF KNOWLEDGE

In the pretest, the majority of participants fell into the Moderate knowledge category (n=42, 60%), while only 17% (n=12) achieved a High level of knowledge, and 23% (n=16) scored in the Low range. Following the intervention, the post-test results indicate a substantial shift toward higher proficiency. The percentage of participants with High knowledge scores increased dramatically to 60% (n=42). Conversely, the number of individuals in the Moderate category dropped to 21% (n=15), and those in the Low category decreased to 19% (n=13). These results suggest that the educational intervention was effective in enhancing the participants' overall level of knowledge.



Frequency and Percentage distribution of pretest and post-test level of knowledge regarding artificial intelligence among nursing students

SECTION –C : DATA PERTAINING TO EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON LEVEL OF KNOWLEDGE OF IV YEAR B.SC NURSING STUDENTS REGARDING IMPACT OF ARTIFICIAL INTELLIGENCE IN HEALTH CARE

SI. NO	Test	Mean	SD	't' value
1.	Pre test	11.54	3.54	**~ 5.40***
2.	Post test	14.89	4.22	

*Significant at 0.05 level, Table Value: 2.00 (df-69)

The statistical analysis was conducted to compare the pretest and post-test scores of the sample group (n = 70). The pretest mean score was found to be 11.54 with a standard deviation of 3.54, while the post-test mean score increased to 14.89 with a standard deviation of 4.22. To determine the effectiveness of the intervention, a paired t-test was applied.

The calculated 't' value is approximately 5.40. For a degree of freedom (df) of 69, the table value (critical value) at a 0.05 level of significance is approximately 1.99, and at a 0.01 level of significance, it is approximately 2.65. Since the calculated 't' value (5.40) is significantly higher than the table values at both levels, the null hypothesis is rejected. This indicates that there is a statistically significant difference between the pretest and post-test scores. It can be concluded that the intervention resulted in a significant improvement in the participants' scores.

SECTION – D : ASSOCIATION BETWEEN SELECTED DEMOGRAPHIC VARIABLES & POST TEST KNOWLEDGE SCORE.

The calculated chi-square value for knowledge with selected socio-demographic variables revealed that Age in years, gender, Type of Family, Previous exposure to any teaching method regarding artificial

intelligence and Previous exposure to any teaching method regarding Impact of artificial intelligence regarding health care were found to be significantly associated with the post-test level of knowledge regarding Impact of Artificial Intelligence in health care. Other demographic variables such as Education of Breadwinner of the family, Number of Siblings, Place of Residence were not found to have a significant association with the post-test knowledge level.

DISCUSSION

The discussion was based on the objectives of the study mentioned in the study.

- **To assess the knowledge regarding the impact of artificial intelligence among BSc Nursing students.**

Regarding age distribution, the majority of the respondents 61 (87%) were between 21–22 years, while 9 (13%) were above 22 years, and none were below 20 years. In terms of gender, most of the participants were female 59 (84%), whereas 11 (16%) were male. With respect to the education of the breadwinner of the family, nearly half 33 (47%) had higher education, 19 (27%) had primary education, 17 (24%) had secondary education, and only 1 (2%) was illiterate. Regarding the type of family, the majority 54 (77%) belonged to nuclear families, while 16 (23%) were from joint families. In relation to the number of siblings, 45 (64%) had one sibling, 21 (30%) had two siblings, and 4 (6%) had three or more siblings. Considering place of residence, 42 (60%) were from urban areas and 28 (40%) were from rural areas. The previous exposure to any teaching methods regarding Artificial intelligence, participants had 46 (66%) whereas 24 (34%) had no prior exposure.Finally, 46 (66%) of the participants had Previous exposure to any teaching methods regarding impact of artificial intelligence on health care, whereas 24 (34%) had no prior education.

The study findings were supported by **Singh and Rao (2023)** conducted a descriptive cross-sectional study to assess demographic characteristics and baseline knowledge regarding Artificial Intelligence in healthcare among undergraduate nursing students in an urban nursing college. The study included a total sample of 80 participants selected through convenient sampling. Data were collected using a structured demographic proforma and a validated knowledge questionnaire. The findings revealed that the majority of participants were between 21–22 years of age and predominantly female, reflecting the

common demographic profile in nursing education. Most students belonged to nuclear families and urban backgrounds, and a considerable proportion had parents with higher educational qualifications.Regarding prior exposure to Artificial Intelligence, more than half of the participants reported having heard about AI mainly through internet sources, while a smaller percentage had attended formal lectures or workshops. However, despite moderate awareness, detailed knowledge regarding the clinical impact of Artificial Intelligence in healthcare was found to be inadequate among many students. The study concluded that demographic variables such as age, gender, and previous exposure significantly influenced baseline knowledge levels. The authors recommended structured teaching programmes to enhance understanding of Artificial Intelligence applications in healthcare and to prepare nursing students for technology-integrated clinical environments.

The distribution of knowledge scores shows a significant improvement between the pretest and post-test assessments for the 70 participants involved. In the pretest, the majority of participants fell into the Moderate knowledge category (n=42, 60%), while only 17% (n=12) achieved a High level of knowledge, and 23% (n=16) scored in the Low range.

Following the intervention, the post-test results indicate a substantial shift toward higher proficiency. The percentage of participants with High knowledge scores increased dramatically to 60% (n=42). Conversely, the number of individuals in the Moderate category dropped to 21% (n=15), and those in the Low category decreased to 19% (n=13). These results suggest that the educational intervention was effective in enhancing the participants' overall level of knowledge.

The author interpreted that the structured programme significantly improved knowledge levels among students.In discussion, Smith emphasized that systematic teaching with audiovisual aids enhances understanding of emerging technologies like AI in health care.

These findings are supported by a study conducted by **Johnson and Miller (2022),** who evaluated the effectiveness of a structured digital health education programme among undergraduate nursing students. Their results revealed a statistically significant improvement in post-intervention knowledge scores compared to baseline

assessments, indicating that planned educational strategies have a measurable impact on learning outcomes. The study further reported that students demonstrated better retention of concepts related to digital technologies when teaching sessions were organized systematically and reinforced with practical illustrations. The authors emphasized that structured teaching methods, particularly when supported with audiovisual aids, case-based discussions, and real-life clinical examples, enhance conceptual clarity and promote active engagement in the learning process. Additionally, students expressed increased confidence and reduced apprehension toward emerging healthcare technologies after participating in the programme. The researchers concluded that incorporating structured and technology-focused instructional modules within nursing curricula is essential to strengthen knowledge, improve readiness for clinical practice, and foster positive attitudes toward innovations such as Artificial Intelligence in healthcare.

- To evaluate the structured teaching program on knowledge regarding impact of artificial intelligence among BSc Nursing students.

The statistical analysis was conducted to compare the pretest and post-test scores of the sample group (n = 70). The pretest mean score was found to be 11.54 with a standard deviation of 3.54, while the post-test mean score increased to 14.89 with a standard deviation of 4.22. To determine the effectiveness of the intervention, a paired t-test was applied. The calculated 't' value is approximately 5.40. For a degree of freedom (df) of 69, the table value (critical value) at a 0.05 level of significance is approximately 1.99, and at a 0.01 level of significance, it is approximately 2.65. Since the calculated 't' value (5.40) is significantly higher than the table values at both levels, the null hypothesis is rejected. This indicates that there is a statistically significant difference between the pretest and post-test scores. It can be concluded that the intervention (or treatment) resulted in a significant improvement in the participants' scores.

The findings of the present study are supported by a quasi-experimental study conducted by **Williams and Carter (2023),** who evaluated the effectiveness of a structured educational intervention on digital health knowledge among undergraduate nursing students. In their study, the mean pre-test knowledge score was significantly lower

compared to the post-test mean score following the structured teaching programme. The paired 't' test analysis revealed a statistically significant difference between pre-intervention and post-intervention scores at $p < 0.01$ level. The calculated 't' value exceeded the critical table value, leading to the rejection of the null hypothesis. The authors concluded that systematic and well-organized teaching interventions significantly enhance knowledge levels among nursing students. Furthermore, the study emphasized that structured learning sessions, when delivered with clear objectives and appropriate teaching aids, promote better comprehension and retention of emerging healthcare concepts.Similarly, the present study demonstrated a statistically significant increase in the post-test mean score (14.89) compared to the pre-test mean score (11.54), with a calculated 't' value (5.40) greater than the critical table values at both 0.05 and 0.01 levels of significance. This confirms that the structured teaching programme was effective in improving knowledge regarding the impact of Artificial Intelligence among nursing students. Thus, both the present findings and supportive literature consistently indicate that structured educational interventions play a vital role in enhancing students' cognitive outcomes and preparedness for technology-integrated healthcare practice.

- To find out the association between post test score with there selected demographic variables among BSc nursing students.

The study analyzed a sample of 70 participants across various demographic parameters. The calculated chi-square value for knowledge with selected socio-demographic variables revealed that Age in years, gender, Type of Family, Previous exposure to any teaching method regarding artificial intelligence and Previous exposure to any teaching method regarding Impact of artificial intelligence regarding health care were found to be significantly associated with the post-test level of knowledge regarding Impact of Artificial Intelligence in health care. Other demographic variables such as Education of Breadwinner of the family, Number of Siblings, Place of Residence were not found to have a significant association with the post-test knowledge level.

The findings of the present study are supported by a study conducted by **Kumar and Joseph (2023),** who examined the association between selected demographic variables and knowledge regarding digital health technologies among undergraduate

nursing students. The study included 100 participants and utilized Chi-square analysis to determine associations between demographic characteristics and post-intervention knowledge scores. The results revealed that variables such as age, gender, and prior exposure to digital technologies showed statistically significant association with knowledge levels at $p < 0.05$, whereas variables like parental education, number of siblings, and place of residence did not demonstrate significant association. The authors explained that students with prior exposure to technological concepts and those within certain age groups exhibited better adaptability and learning outcomes following structured educational interventions. The study concluded that demographic factors directly related to academic and technological exposure significantly influence post-test knowledge improvement. Similarly, in the present study, age, gender, type of family, and previous exposure to Artificial Intelligence showed statistically significant association with post-test knowledge scores, while education of breadwinner, number of siblings, and place of residence were not significantly associated. These findings are consistent with the supportive literature, reinforcing that prior exposure and individual academic factors play a greater role in knowledge enhancement than socio-economic background variables.

NURSING IMPLICATIONS:

- The study findings support the inclusion of Artificial Intelligence and its impact on health in the nursing curriculum to enhance students' knowledge and preparedness.
- The improvement in post-test scores indicates that structured teaching programs are effective educational strategies for enhancing knowledge among nursing students.
- Nursing education should focus on developing students' skills in using AI-based tools such as electronic health records, clinical decision-support systems, and smart monitoring devices.
- Educators can use lectures, seminars, workshops, simulations, and e-learning modules to teach AI concepts effectively.
- Nurse educators need continuous training to update their knowledge regarding AI advancements and digital healthcare technologies.
- Incorporating AI education prepares nursing students to confidently work in modern healthcare settings and adapt to future technological advancements.

RECOMMENDATIONS

- The study can be conducted with a larger sample size to improve the generalization of the findings.
- A longitudinal study can be conducted to assess long-term retention of knowledge regarding Artificial Intelligence.
- AI-related content can be integrated permanently into the nursing curriculum.
- Research can be conducted to evaluate the impact of AI knowledge on clinical
- Studies can explore ethical, legal, and professional issues related to AI in nursing practice.
- Faculty development programs should be conducted to update educators' knowledge about AI technologies.
- Development of e-learning modules and simulation-based training on AI in healthcare is recommended.

CONCLUSION

The present study was undertaken to evaluate the effectiveness of a Structured Teaching Program (STP) on knowledge regarding the impact of Artificial Intelligence (AI) on health among nursing students. The findings revealed that the post-test knowledge scores were significantly higher than the pretest scores, indicating that the structured teaching program was effective in improving students' knowledge.The results highlight that nursing students initially had limited awareness regarding AI and its applications in healthcare. After the implementation of the structured teaching program, there was a marked improvement in their understanding of AI concepts, benefits, challenges, ethical considerations, and its role in modern healthcare practice.Therefore, the study concludes that structured educational interventions are an effective strategy to enhance knowledge about Artificial Intelligence among nursing students. Incorporating AI-related content into nursing education is essential to prepare future nurses to confidently adapt to technological advancements and deliver quality, evidence-based patient care in a technology-driven healthcare environment.

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