

# A Study to Assess the Knowledge and Attitude on Artificial Intelligence in Health Care Among Nursing Students at Selected Nursing Colleges at Kuppam

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## Abstract

*Artificial intelligence (AI) is increasingly transforming healthcare by enhancing patient care, improving diagnostic accuracy, and streamlining administrative processes. However, the preparedness of future nursing professionals, particularly their knowledge and attitudes towards AI, remains an important yet underexplored area. This study aimed to assess the knowledge and attitudes of nursing students regarding AI in healthcare at a selected nursing college in Kuppam, Andhra Pradesh. A descriptive cross-sectional study with a quantitative approach was conducted among 277 nursing students. Data were collected from November 20, 2023, to December 2, 2023, using a structured and validated questionnaire covering demographic details, knowledge, and attitudes towards AI in healthcare. Data analysis was performed using descriptive and inferential statistics, including chi-square tests and correlation analysis. The findings revealed that the majority of participants were young ( $\leq 20$  years), from rural backgrounds, and had limited access to technological resources. Most students demonstrated a basic level of knowledge about AI (54.5%), while a large proportion showed a positive attitude towards its use in healthcare (89.9%). The correlation between knowledge and attitude was weak and not statistically significant ( $r = 0.015$ ,  $p = 0.803$ ). Significant associations were observed between knowledge and parental education and occupation, while attitude was significantly associated with age, academic year, and mother's occupation. In conclusion, although nursing students exhibited positive attitudes towards AI, their knowledge levels were limited. These findings highlight the need for targeted educational interventions to enhance AI literacy and better prepare future nurses for technological advancements in healthcare.*

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Received Date: February 11, 2026

Accepted Date: March 05, 2026

Published Date: April 05, 2026

**Citation:** M. Melvin David, T.K. Sreedevi, K. Daniel Arun Kumar, M. Abhirami, M.N. Pavithra, R. Aruna Kumari, S. Subhavelvizhi, Nigha Anjum S.N. A Study to Assess the Knowledge and Attitude on Artificial Intelligence in Health Care Among Nursing Students at Selected Nursing Colleges at Kuppam. Journal of Nursing Science & Practice. 2026; 16(1): 17–23p.

**Keywords:** Artificial intelligence, healthcare, nursing students, knowledge, attitude, technological adoption

## INTRODUCTION

Artificial intelligence (AI) is rapidly transforming various sectors, including healthcare. AI's capacity for AI to analyze extensive datasets holds significant promise for enhancing the accuracy and efficiency of medical diagnoses, treatment planning, drug discovery, and administrative processes. The integration of AI in healthcare is expected to revolutionize patient care and outcomes [1–4].

Given the increasing prevalence of AI in clinical settings, understanding the preparedness of future healthcare professionals, including nurses, to utilize

and collaborate with AI-powered technologies is crucial. As frontline caregivers, nurses play a vital role in the successful adoption and implementation of AI in healthcare. Therefore, assessing their understanding and perceptions of AI is essential to identify educational needs and ensure a smooth transition into an AI-enhanced healthcare environment [5–9].

This study focuses on nursing students, the future workforce of the nursing profession, to evaluate their current knowledge and attitudes towards AI in healthcare. By understanding their baseline knowledge and perceptions, educators can tailor curricula to address any gaps and foster a positive attitude towards the integration of AI in their future practice. This study aimed to assess the knowledge and attitudes toward artificial intelligence in healthcare among nursing students at a selected nursing college in Kuppam, providing insights into how future healthcare professionals are preparing for AI advancements [10–14].

## METHODS

This study employed a descriptive cross-sectional research design with a quantitative approach to assess the knowledge and attitudes of nursing students towards AI in healthcare. The study was conducted at selected nursing colleges located in Kuppam, Chittoor District, Andhra Pradesh, focusing on students from all academic years (1st to 4th year) of the nursing program. The study population comprised all nursing students enrolled in these colleges. A convenient sampling technique was used to recruit a sample size of 277 nursing students, which was calculated based on a previously published study. The inclusion criteria were nursing students enrolled in the selected colleges across all academic years, willing to participate voluntarily, and providing informed consent. Students on sick leave or absent during data collection were excluded. Data were collected using a structured questionnaire consisting of three sections: demographic variables, knowledge towards AI in healthcare (25 items), and attitude towards AI in healthcare (10 items). The knowledge section used a dichotomous (Yes/No) and multiple-choice format, while the attitude section utilized a 5-point Likert scale ranging from strongly agree to strongly disagree. Content and tool validity were ensured through expert consultation. A pilot study was conducted on 30 nursing students to assess the feasibility and reliability of the questionnaire, resulting in a reliability coefficient (Cronbach's alpha) of  $r = 0.81$  for the attitude scale. Formal permission was obtained from the Principal of PES College of Nursing, Kuppam, and ethical clearance was secured from the Institutional Research Committee (IRC) and Institutional Human Ethics Committee (IHEC) of PES Institute of Medical Sciences and Research (PESIMSR), Kuppam. Data were collected from November 20th to December 2nd, 2023. The collected data were tabulated and analyzed using descriptive statistics (frequency and percentage) and inferential statistics (chi-square test for association to determine the relationship between knowledge and attitude with demographic variables) using SPSS software.

## OBSERVATIONS AND RESULTS

### Demographic Variables of Nursing Students

Table 1 presents the frequency and percentage distributions of the demographic variables of the nursing students. The majority of the students (81.6%) were  $\leq 20$  years of age, and all respondents were female (100%). The distribution across academic years was as follows: 1st year (60.3%), 2nd year (33.9%), 3rd year (0.7%), and 4th year (5.1%). Regarding fathers' education, the distribution was as follows: no formal education (10.8%), primary education (20.2%), secondary education (23.1%), graduate (30.7%), and postgraduate and above (15.5%).

### Level of Knowledge Towards AI in Health Care Among Nursing Students

Table 2 presents the distribution of nursing students' knowledge of AI in healthcare. The majority (54.5%) had basic knowledge, followed by average (26.7%), poor (12.3%), and good knowledge (6.5%).

**Table 1.** Frequency and percentage distribution of demographic variables of the nursing students (N=277).

| S.N. | Demographic variables        | Frequency | Percentage |
|------|------------------------------|-----------|------------|
| 1    | <b>Age category</b>          |           |            |
|      | >20 years                    | 51        | 18.4       |
|      | ≤20 years                    | 226       | 81.6       |
| 2    | <b>Gender</b>                |           |            |
|      | Female                       | 277       | 100        |
| 3    | <b>Academic year</b>         |           |            |
|      | 1st Year                     | 167       | 60.3       |
|      | 2nd Year                     | 94        | 33.9       |
|      | 3rd Year                     | 2         | 0.7        |
|      | 4th Year                     | 14        | 5.1        |
| 4    | <b>Father's education</b>    |           |            |
|      | No formal education          | 30        | 10.8       |
|      | Primary education            | 56        | 20.2       |
|      | Secondary education          | 64        | 23.1       |
|      | Graduate                     | 85        | 30.7       |
|      | Postgraduate and above       | 42        | 15.5       |
| 5    | <b>Father's occupation</b>   |           |            |
|      | Daily wages                  | 197       | 71.1       |
|      | Government Job               | 7         | 2.5        |
|      | Health care worker           | 3         | 1.1        |
|      | IT-related job               | 2         | 0.7        |
|      | Private job                  | 68        | 24.5       |
| 6    | <b>Mother's occupation</b>   |           |            |
|      | Daily wages                  | 159       | 57.4       |
|      | Government Job               | 11        | 4          |
|      | Health care worker           | 5         | 1.8        |
|      | Housewife                    | 38        | 13.7       |
|      | IT-related job               | 2         | 0.7        |
|      | Private job                  | 62        | 22.4       |
| 7    | <b>Income category</b>       |           |            |
|      | > Rs.15000                   | 132       | 47.7       |
|      | ≤ Rs.15000                   | 145       | 52.3       |
| 8    | <b>Area of residence</b>     |           |            |
|      | Rural                        | 249       | 89.9       |
|      | Urban                        | 28        | 10.1       |
| 9    | <b>Type of family</b>        |           |            |
|      | Joint                        | 43        | 15.5       |
|      | Nuclear                      | 234       | 84.5       |
| 10   | <b>Computer in home</b>      |           |            |
|      | No                           | 218       | 78.7       |
|      | Yes                          | 59        | 21.3       |
| 11   | <b>AI features in mobile</b> |           |            |
|      | No                           | 249       | 89.9       |
|      | Yes                          | 28        | 10.1       |

**Table 2.** Frequency and percentage distribution of the level of knowledge towards AI in health care among nursing students (N = 277).

| Level of knowledge | Frequency | Percentage |
|--------------------|-----------|------------|
| Poor knowledge     | 34        | 12.30%     |
| Basic knowledge    | 151       | 54.50%     |
| Average knowledge  | 74        | 26.70%     |
| Good knowledge     | 18        | 6.50%      |
| Total              | 277       | 100.00%    |

**Table 3.** Frequency and percentage distribution of the level of attitude towards AI in health care among nursing students (N = 277).

| Level of attitude | Frequency | Percentage |
|-------------------|-----------|------------|
| Negative attitude | 3         | 1.1%       |
| Neutral           | 25        | 9.0%       |
| Positive attitude | 249       | 89.9%      |
| Total             | 277       | 100.0%     |

**Table 4.** Correlation between knowledge and attitude towards AI among nursing students (N=277).

| Variables       | Mean  | Standard deviation | r-value | p-value |
|-----------------|-------|--------------------|---------|---------|
| Knowledge score | 11.16 | 4.414              | 0.015   | 0.803   |
| Attitude score  | 28.5  | 4.82               |         |         |

### Level of Attitude Towards AI in Health Care Among Nursing Students

Table 3 presents the distribution of nursing students' attitudes towards AI in healthcare. Among the 277 participants, the majority exhibited a positive attitude (249 students, 89.9%), indicating a favorable perspective towards AI implementation. A smaller portion held a neutral stance (25 students, 9.0%), while only a minimal proportion displayed a negative attitude (3 students, 1.1%). This breakdown reflects the diverse attitudes of nursing students regarding the integration of AI into healthcare practices.

### Correlation Between Knowledge and Attitude Towards AI Among Nursing Students

Table 4 summarizes the descriptive statistics and correlations between the knowledge score and attitude score among nursing students. The mean knowledge score is 11.16 with a standard deviation of 4.414, while the mean attitude score is 28.50 with a standard deviation of 4.820, based on data from 277 participants. The correlation between knowledge score and attitude score is very weak ( $r = 0.015$ ) with a two-tailed significance of 0.803, indicating no significant correlation between knowledge and attitude scores.

### Association of Level of Knowledge Towards AI Among Nursing Students with Their Demographic Variables

The association between the level of knowledge of nursing students and various demographic variables. The analysis revealed significant associations at the  $p < 0.01$  level for certain variables, including father's education, mother's education, and father's occupation. However, other variables, such as age category, academic year, mother's occupation, income category, area of residence, type of family, presence of a computer in the home, and use of AI features in mobile devices, were not found to be significantly associated with the level of knowledge. These findings shed light on the factors influencing knowledge levels among participants, underscoring the importance of socioeconomic factors and technological access in shaping knowledge levels regarding AI among nursing students [15–18].

### **Association of Level of Attitude Towards AI Among Nursing Students with Their Demographic Variables**

Chi-square analysis revealed several significant associations between demographic variables and attitude levels among nursing students. Age category and academic year demonstrated statistically significant relationships with attitude levels ( $\chi^2 = 9.061$ ,  $p = 0.011$ ;  $\chi^2 = 17.869$ ,  $p = 0.007$ ). Specifically, individuals aged  $\leq 20$  years and those in their 1st year of study exhibited higher levels of positive attitude than their counterparts. Mother's occupation was significantly associated with attitude ( $\chi^2 = 24.611$ ,  $p = 0.006$ ), indicating that respondents whose mothers were engaged in daily wage work tended to have lower levels of positive attitude. Other variables, such as father's education, father's occupation, income category, area of residence, type of family, presence of a computer at home, and use of AI features in mobiles, did not demonstrate statistically significant associations with attitude levels. These findings highlight the importance of age, academic year, and mothers' occupations in shaping attitudes among nursing students [19].

### **DISCUSSION**

The demographic profile of the nursing students in this study revealed that the majority (81.6%) were 20 years of age or younger, and all participants were female (100%). The distribution across academic years showed that the largest proportion was in their 1st year (60.3%), followed by the 2nd year (33.9%). Regarding socioeconomic background, a notable percentage of fathers had no formal education (10.8%) or only primary education (20.2%), while a significant portion had a graduate (30.7%) or postgraduate degree and above (15.5%). The predominant occupation of fathers was daily wage labor (71.1% of fathers). Similarly, a large percentage of mothers were engaged in daily wage work (57.4%), with a smaller proportion being housewives (13.7%) or working private jobs (22.4%). A substantial portion of the students came from families with an income of  $\leq$  Rs. 15000 (52.3%) and who resided in rural areas (89.9%). Furthermore, a large majority of the students did not have a computer at home (78.7%) and did not use AI features on their mobile phones (89.9%) [20].

Regarding their knowledge of AI in healthcare, the study found that the majority of nursing students (54.5%) possessed only basic knowledge, followed by average knowledge (26.7%), poor knowledge (12.3%), and only a small percentage had good knowledge (6.5%). In contrast to their knowledge levels, the attitude towards AI in healthcare was overwhelmingly positive, with 89.9% of students expressing a favorable perspective. Only a small fraction held neutral (9.0%) or negative (1.1%) attitudes.

Interestingly, the correlation analysis revealed a very weak and statistically insignificant relationship between the knowledge and attitude scores ( $r = 0.015$ ,  $p = 0.803$ ). This suggests that students' positive attitude towards AI in healthcare is not necessarily dependent on their level of knowledge about it.

Further analysis explored the association between students' knowledge levels and their demographic variables. Significant associations ( $p < 0.01$ ) were found for father's education, mother's education, and father's occupation. This indicates that students whose parents, particularly fathers, had higher levels of education and were engaged in more skilled occupations tended to have better knowledge of AI in healthcare than their counterparts. However, age, academic year, mother's occupation, income category, area of residence, type of family, presence of a computer at home, and use of AI features in mobile devices did not show a significant association with the level of knowledge.

The analysis of the association between attitude levels and demographic variables revealed significant relationships with age and academic year ( $p = 0.011$  and  $p = 0.007$ , respectively). Specifically, students aged  $\leq 20$  years and those in their 1st year of study exhibited higher levels of positive attitude. Additionally, the mother's occupation was significantly associated with attitude ( $p = 0.006$ ), with students whose mothers were daily wage workers tending to have lower levels of positive attitude. Other demographic variables, such as father's education, father's occupation, income category, area of residence, type of family, presence of a computer at home, and use of AI features in mobiles, did not show statistically significant associations with attitude levels [21].

## CONCLUSION

This study provides valuable insights into nursing students' demographic characteristics, knowledge, and attitudes towards AI in healthcare. The findings highlight that while the majority of students have a positive attitude towards AI, their level of knowledge is predominantly basic. The lack of a significant correlation between knowledge and attitude suggests that other factors may influence their favorable perception of AI in healthcare.

The significant associations found between parental education and occupation and students' knowledge levels underscore the influence of socioeconomic factors on their understanding of emerging technologies such as AI. Furthermore, the finding that younger students and those in their initial years of study have a more positive attitude, along with the influence of mothers' occupations on attitudes, warrants further investigation into the factors shaping these perspectives.

The high percentage of students from rural backgrounds with limited access to computers and AI features in mobile phones suggests a potential digital divide that could affect their exposure to and understanding of AI. Educational interventions tailored to address knowledge gaps and potentially leverage existing positive attitudes could be beneficial in preparing future nursing professionals for the increasing integration of AI in healthcare. Future research could explore the specific factors contributing to positive attitudes despite limited knowledge and investigate the long-term impact of these attitudes and knowledge levels on the adoption of AI in future practice.

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