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Artificial Intelligence in Nursing Education: Utilization, Perceived Impact, and Attitudes among Final-Year State Diploma Nursing Students in the Western Province, Sri Lanka: A Cross-Sectional Study

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Abstract

Background

Artificial Intelligence (AI) is reshaping education globally, offering transformative opportunities in teaching, learning, and academic administration. Aim is to assess the usage, attitudes towards Artificial Intelligence (AI) and its impact on students in higher education among final year state diploma nursing students in Western Province, Sri Lanka.

Method

This descriptive cross-sectional study on total of 422 students from the Schools of Nursing in Colombo, Kandana, and Kalutara were selected through systematic sampling. Data was collected using a self-administered questionnaire comprising sociodemographic data, AI usage patterns, the AI Impact Scale, and the Student Attitude Toward Artificial Intelligence (SATAI) scale.

Results

Results revealed high AI adoption, with 95.5% of students reporting AI usage in their education. ChatGPT emerged as the most frequently used tool (95.5%), followed by language and communication tools (73.5%) and organizational tools (54%). The majority (83.6%) reported using AI either daily or several times a week. While 87% reported moderate computer literacy, AI usage was found to be positively associated with computer knowledge and negatively associated with age, indicating younger students were more active AI users. Attitudes toward AI were overwhelmingly positive. The cognitive component in the SATAI scale scored highest (mean = 3.91), followed by behavioral (3.76) and affective (3.70) domains. A significant proportion (78.9%) demonstrated moderately to very positive attitudes toward AI. The statement "It is interesting to use AI" showed a statistically significant association with usage ($p = 0.024$), emphasizing the role of engagement in adoption. In terms of AI's impact, students scored highest in the dimensions of AI dependency (mean = 3.87) and academic performance (mean = 3.85), highlighting both the support and potential risks of over-reliance.

Conclusion

AI has been widely embraced among nursing students in Sri Lanka, with positive attitudes and perceived benefits in academic performance, learning experience, and career guidance. However, ethical concerns and dependency issues warrant attention. These findings highlight the need for structured AI education and policy development to ensure responsible and effective AI integration in higher education.

BACKGROUND

Within the field of education, AI has already performed a massive transformation in teaching as well as in the learning process. AI performs significant duties such as enabling personalized education for students, automating tasks, and providing predictive analysis. Higher education also has its challenges with continuously changing and updating curricula in the 21st century. The traditional ways of teaching and learning are being reshaped by AI. To be compatible with the dynamic changes, students see AI as an innovative solution. The changing nature of education prepares students for a new world with technological advancements, consisting of virtual engagement and automated help. Thus, the usage and attitudes towards AI in Sri Lanka have not been assessed yet. Artificial intelligence (AI) can be defined as, “software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal” [1]. In the past ten years, research on artificial intelligence (AI) in medicine and health has expanded significantly [2]. AI started its journey around the 1950s but was limited to specific task-oriented work in machines. With time, it has developed into the capacity to hold and work with a huge volume of data. Within the field of education, AI has already performed a massive transformation in teaching as well as in the learning process. AI performs significant duties such as enabling personalized education for students, automating tasks, and providing predictive analysis. Higher education also has its challenges with continuously changing and updating curricula in the 21st century. To be compatible with the dynamic changes, students see AI as an innovative solution [3]. The ability of intelligent machines and the ongoing development of new technologies are strongly related in the context of higher education. In the realm of teaching and learning, this dynamic environment presents several never-before-seen opportunities and problems [4]. The traditional ways of teaching and learning are being reshaped by AI. This technology holds the potential to drastically change the dynamics of traditional teaching by enabling virtual engagement and providing automated help to provide more flexible curricula that can be adjusted to the needs of the twenty-first century [5]. The changing nature of education prepares students for a new world with technological advancements [6]. With COVID-19, there was a drastic push among students to seek the help of digital education as physical learning was impossible. Then, a trend toward online education emerged among students, leading the educational institutes to embrace digital education [7]. In March and April 2020, within three weeks of the pandemic's onset, 1.6 billion students lost their regular school attendance and had to depend on technology for formal education, according to UNESCO [8]. According to a Microsoft survey carried out in 2024, 47% of education leaders use AI every day, 68% of all educators have used AI at least once or twice, and 62% of higher education students have used it at least once or twice [9]. According to a survey conducted by the global marketing firm Allison Worldwide, which included 1,500 participants in the U.S., 1,000 students aged 14–22, and 500 teachers at the high school or college level, college students reported significantly higher AI usage than high school students. Specifically, 82% of college students indicated they had used AI, compared to 58% of high school students [10]. Using AI in education also emphasizes the concerns of risks associated with AI, as it has a direct impact on the human thinking capacity [11]. Both educators and students should remain aware of its limitations. In a clinical context, we observe tolerance and withdrawal as

consequences associated with substances. But in the new era of digitalization, AI has effects such as dependence and addiction [12]. Students are believed to reduce their critical thinking skills after excessive use of these tools [11]. The users, specifically students, should be thoroughly educated on the responsible use of AI. It is questionable whether AI will replace educators in the future. Nevertheless, future education indeed lies in the coexistence between humans and AI [13]. With technological advancements in the world, it is not practical to prevent students from using AI, but rather, new educational strategies should be provided to balance the use of AI. Somewhat restrictions can be provided outlining the acceptable AI use in educational and clinical settings. Ethical considerations and the importance of maintaining human oversight in all AI-assisted tasks can be highlighted. If students are given complete freedom to rely on AI, we may face a future generation where creativity dwindles and the ability to generate original ideas is lost.

The interaction between humans and AI will likely shape the Fourth Industrial Revolution [14]. AI association with higher education has become one of the most trending topics in today's world [15]. According to systematic review research, there was a nearly two-to-three-fold rise in publications in 2021 and 2022 over the prior years. New tendencies have surfaced as a result of the AI in higher education publications rising so quickly. Six of the seven continents were covered by the research, with China surpassing the US in the quantity of articles. Furthermore, there has been a noticeable change in the affiliation of researchers; education is now the most dominant department, in contrast to previous surveys that indicated these departments had a dearth of researchers. 72% of the studies focused on undergraduate students [15]. Worldwide, recent study findings show a promising trend, showcasing that the new generation is enthusiastically embracing the advancements and opportunities presented by AI. In recent Malaysian studies (2023) conducted across 31 Malaysian medical schools, involving 300 students, have revealed, 71% of the students believe that integrating AI into their education will significantly benefit their careers. Furthermore, 69.44% of the participants agree that all students should receive AI education [16]. Still, there is a vast area that is yet to be researched. There is a need to broaden the academic understanding of AI in education because the field is expanding and changing quickly. A Gap has been highlighted by researchers [17] on the necessity of enhancing our comprehension of the impact of AI in educational settings. As of 2022, computer literacy in Sri Lanka is at 34.3% and digital literacy at 57.2% [18]. But there are no exact relevant studies that show direct results on the usage of AI in higher education among Sri Lankan students. To fill in that gap, this study addresses how often students use AI in their higher education. And also, on how the use of AI has impacted higher education in terms of their personal experience and lastly, addresses attitudes towards AI while using it in their higher education.

METHODOLOGY

This study aimed to assess the usage, attitudes towards artificial intelligence, and its impact on students in higher education among final-year state diploma nursing students in Western Province, Sri Lanka.

Study Design and setting

Study was conducted as a descriptive cross-sectional study among the final year undergraduate nursing students in 3 state Nursing schools, which were, School of Nursing Colombo, School of Nursing Kandana, and School of Nursing, Kalutara in the Western Province, Sri Lanka.

Study participants and sampling strategy

In the study, 422 students were included despite gender. Participants were selected using a systematic sampling method. A separate list of all final-year diploma nursing students was taken from each of the state Nursing Schools. All names were rearranged into alphabetical order. The skip interval/ sampling interval (k) was calculated with the use of the known population size (N) and the sample size (n). The final selected students were taken into a final list. Afterwards, every 2nd student was taken from the list of students.

$k = N/n$

$k = 824/423 = 1.947 \sim 2$

So, every 2nd student will be taken from the list of students. After the random selection of the initial study participants, selection will be continued with a skip interval to reach the required sample size of 423.

$$\text{The number of students included from one nursing school} = \frac{\text{The number of final-year diploma students in the nursing school}}{\text{Total number of final year diploma students in the Western Provinces.}} \times \text{Sample size}$$

Study tool

The main study instrument used was a self-administered questionnaire (SAQ). The questionnaire consisted of 4 sections. Section A consisted of sociodemographic information. Section B consisted of questions regarding the usage of AI in their education. Section C consisted of a scale related to assessing the impact of AI on students' higher education [19]. This scale consisted of 51 questions,

which are categorized into learning experiences, academic performance, career guidance, motivation, self-reliance, social interaction, and AI dependency. This was a standardized assessment tool designed for specific aspects of the unique environment of artificial intelligence in higher education. It was a valid and reliable tool to assess AI's impact on higher education [19] Section D consisted of the Student Attitude Toward Artificial Intelligence (SATAI) scale with 26 questions related to exploring student attitudes toward artificial intelligence in cognitive, affective, and behavioral components. This scale assessed the interest, learner's career, necessity of learning AI, and perceived usefulness for the learner and society [14]. Sections C and D were scored based on a five-point Likert scale. 5 points for strongly agree, 4 points for agree, 3 points for undecided, 2 points for disagreement, and 1 point for strongly disagree.

Study tool validation and ethical considerations

The scale in section C was already validated through research done in a Nueva Ecija University of Science and Technology – Gabaldon campus, Philippines in 2024, involving 635 students. Section D is also consistent with a scale that was developed by verifying reliability and validity by using a sample of 305 students from Korea in 2022. This scale made students' attitudes toward AI operational and quantifiable. Accordingly, educators can use it to diagnose the current status of students or verify the effectiveness of new AI education methods [14]. Ethical approval for the study was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo on 19th September 2024 (Reference no: EC-24-122). The written informed consent was obtained by the participants following an introduction session about the research study provided for them prior to data collection. Permission and approval to collect data was obtained from the Director of Nursing Education, Ministry of Health in Sri Lanka, and all the principals of the Schools of Nursing Colombo, Kandana, and Kalutara.

Data Analysis

All the data collected were entered into an Excel sheet and was analyzed for its descriptive characteristics through SPSS (Statistical Software for Social Sciences) version 27. One-way ANOVA test was used to explore statistical significance between AI usage to its impact on higher education.

RESULTS

From the School of Nursing, Colombo, 189 students participated; from the School of Nursing, Kandana, 122 students, and from the School of Nursing, Kalutara, 112 students participated in the study. All of the study participants were 21–30 years old. The demographic characteristics of the study participants, including marital status, ethnicity and religion are presented below (Table 01).

Table 1
Demographic data of the participants

Variables	Frequency (n)	Percentage (%)
Marital status		
Unmarried	412	95.4%
Married	10	2.3%
Ethnicity		
Sinhala	375	88.9%
Tamil	35	8.3%
Muslim	12	2.8%
Religion		
Buddhist	361	83.6%
Catholic	35	8.1%
Hindu	12	2.8%
Islam	14	3.2%

Out of 422 undergraduate participants, the majority (376; 87%) reported having moderate knowledge of computer use, indicating a moderate comfort level with digital tools but potentially limited advanced technical skills. This suggests that most respondents are reasonably proficient with technology, which may correlate with their ability to effectively use AI tools in education. A smaller segment of 32 (7.4%) participants had limited knowledge, implying minimal familiarity with computers. A minor group of 14 (3.2%) participants reflected a highly skilled and advanced computer knowledge.

Table 2
AI Adoption and Usage Frequency Among Undergraduate Students

Usage Category	Frequency (n)	Percentage (%)
AI Adoption		
Use of AI in education	**402**	**95.5%**
Do not incorporate AI in education	20	4.5%
Usage frequency		
Several times a week	**216**	**50%**
Daily	145	33.6%
Several times a month	28	6.5%
Rarely	25	5.8%
Once a week	5	1.2%
Once a month	3	0.7%

Regarding AI usage, 402 students (95.5%) reported incorporating AI into their education, whereas 20 students (4.5%) did not use AI. These results demonstrate widespread AI usage among undergraduates with varying levels of frequency. The data reveals near-universal AI adoption, with 95.5% of students incorporating AI into their education. This overwhelming majority suggests AI has become fundamental to contemporary undergraduate education. The remaining 4.5% non-users may represent either technological resisters, students in disciplines with limited AI applications, or those lacking access to AI tools. The survey responses revealed a diverse usage of AI tools among participants, totaling 1,304 selections across categories. In terms of core users of AI (83.6%), the combination of daily and several-time-weekly users indicates AI has become routine in academic workflows for the majority. The moderate users (8.4%), those using AI several times a month or weekly, may employ it for specific tasks rather than integrated learning. Marginal users (6.5%), the rarely/once-a-month users, suggest either selective usage or discomfort with regular AI integration. Comparison of the computer knowledge and AI use suggests that computer knowledge may no longer be the primary barrier to AI usage it once was, given that even minimal technical skills now enable access to user-friendly AI tools (Table 2).

Table 3
Types of AI tools and their frequency of use among students

AI Tools	Frequency(n)	Percentage (%)
Chat GPT	**403**	**95.5%**
Language and communication tools (eg: Google Translate, Replika)	310	73.46%
Organizing tools (eg: Microsoft Office 365, Evernote)	228	54.02%
Writing assistance tools (Grammarly, Quill Bot, Zotero)	101	23.93%
Communication Platforms (eg: Slack, Microsoft Teams)	99	23.46%
Virtual learning assistants (eg: Khan academy, Coursera, Duolingo)	61	14.45%
Voice-activated assistants (eg: Siri, Alexa)	54	12.8%
Personalized learning platforms (eg: Socratic by Google, Carnegie Learning)	28	6.63%
AI-powered research tools (eg: Mendeley)	20	4.74%

The most frequently selected, dominant AI tool was Chat GPT (403 mentions, 95.5%), indicating its central role in academic assistance. Language and communication tools such as Google Translate and Replika. Organizing tools like Microsoft Office 365 and Evernote were widely used, suggesting students rely on AI for more efficiency. Less frequently selected tools included Voice-activated assistants (e.g., Siri, Alexa), Personalized learning platforms (e.g., Socratic by Google, Carnegie Learning), and AI-powered research tools (e.g., Mendeley), possibly due to lack of awareness and accessibility (Table 3).

Additionally, age and AI usage demonstrated a negative relationship, indicating that younger students were more likely to use AI. In contrast, computer knowledge showed a positive relationship with AI usage, suggesting that students with higher levels of computer proficiency were more inclined to incorporate AI into their studies. These findings highlight the role of confidence, age, and computer skills in influencing AI adoption in education. The statement, *"It is interesting to use AI,"* was found to be statistically significant in relation to AI use ($p = 0.024$). This suggests that students who found AI usage interesting were more likely to incorporate it into their studies, emphasizing the role of engagement and curiosity in the adoption of AI. The Student Attitude Toward Artificial Intelligence (SATAI) scale was used to assess student attitudes in three components: emotional, behavioral, and cognitive. Results revealed that most students responded positively, indicating ‘agree’ with statements reflecting favorable emotional relations toward AI, willingness to engage with AI-related activities (behavioral domain), and strong beliefs about the relevance and importance of AI in higher education (cognitive domain). However, responses to the question, *"I will choose a job in the field of AI,"* were predominantly neutral, with the majority selecting "undecided," suggesting uncertainty regarding AI's direct relevance to their career

aspirations. These findings highlight an overall positive attitude toward AI in education, albeit with some hesitancy regarding its direct career applicability.

The average student's attitudes towards AI considering the cognitive components were the highest mean score at 3.91, with the behavioral and affective components at 3.76 and 3.70 (Table 4).

Table 4
Participants' mean score for different domains at SATAI scale

Domain	Mean ± SD
Cognitive	**3.91** ± 0.69
Behavioral	3.76 ± 0.79
Affective	3.70 ± 0.78

The Student Attitude Toward Artificial Intelligence (SATAI) scale has a total score range of 26–130. The distribution of participants' scores ranged from a minimum of 59 to a maximum of 130. These findings highlight that most participants achieved scores within the mid to higher ranges (Table 5).

Table 5
Participants' total score distribution on SATAI scale

SATAI Score range	Student Attitude	Frequency (n)	Percentage (%)
116–130	Very Positive	19	4.4%
101–115	Moderately positive	184	42.6%
86–100	Positive	157	36.3%
71–85	Slightly positive	56	13.0%
56–70	Negative	6	1.4%

The majority of students (78.9%) scored in the Positive to Moderately Positive ranges (86–115), indicating generally favorable attitudes toward AI in education. Only a minimal 1.4% fell in the Reserved/Negative range, suggesting strong overall acceptance of AI technologies. Students have an average score of 97.79 on the SATAI scale, which is within the mid to higher ranges, indicating a positive attitude towards AI and the likelihood that a student will be an active participant in AI education. The highest mean score (4.12) was recorded for the statement, *"It is interesting to use AI,"* reflecting a strong positive sentiment among participants toward engaging with AI.

A significant cluster (42.6%) appeared in the 101–115 (Positive) range, representing the modal attitude. This suggests cautious optimism about AI's role in education and willingness to adopt AI while maintaining some reservations. The secondary cluster at 86–100 (36.3%) shows another substantial

group with positive but more measured enthusiasm. Students in the (1.4% at 56–70) Negative group might include students concerned about AI ethics, limited AI exposure, and those who prefer traditional learning methods (Table 5).

The impact of AI on higher education consisted of 51 items which represent seven dimensions, including AI dependency (9 items), Social Interaction (9 items), Career Guidance (10 items), Academic Performance (6 items), Learning experience (6 items), Self-reliance (6 items) and Motivation (5 items).

Table 6
Mean and Mode for each dimension

Dimensions	Mean ± SD	Mode
AI dependency	**3.87 ± 0.69**	4
Social Interaction	3.68 ± 0.74	4
Career Guidance	3.66 ± 0.72	4
Academic Performance	3.85 ± 0.66	4
Learning experience	3.59 ± 0.78	4
Self-reliance	3.53 ± 0.83	4
Motivation	3.61 ± 0.75	4

Among the seven dimensions, AI dependency had the highest mean score (3.87 ± 0.69), suggesting that students increasingly rely on AI tools for academic tasks (Table 6).

Table 7
Statistically Significant Learning Outcomes Associated with AI Use Among Students”

Variables	P value
Confident and capable with the assistance of AI in my studies	0.018
Believe that AI has positively impacted my overall educational journey	< 0.001
Feel that AI has improved the quality of my learning outcomes	0.007
Actively seek out AI-powered tools and resources to enhance learning experience	0.025
AI-powered platforms have provided spaces for online discussions and knowledge sharing	0.005

P values were obtained from a one-way ANOVA comparing mean scores between AI users and non-users; effect sizes were calculated with 95% confidence intervals.

Results indicate that AI significantly enhances students' confidence and perceived capability, with the highest mean score (4.1 ± 0.58) observed for the statement, *“I feel more confident and capable with the assistance of AI in my studies”* (p = 0.018), indicating a statistically significant positive impact of using AI

on students' self-efficacy. This indicates that students who agreed with this statement were more likely to incorporate AI in their studies, highlighting the positive impact of AI on students' confidence and perceived capability in their academic activities. Students perceive a strong overall positive impact of AI on their educational experience. This is the most statistically significant factor ($p < 0.001$), indicating that AI use is strongly associated with improved perceptions of learning. Use of AI is also associated with enhanced learning outcomes ($p = 0.007$), meaning students feel their performance and understanding are better supported by AI tools. Students who use AI are more proactive in exploring tools and resources, reflecting self-directed learning behavior facilitated by AI ($p = 0.025$). AI encourages collaboration and peer learning, as students engage in discussion forums and shared learning spaces more effectively ($p = 0.005$). (Table 7)

Table 8
Mean values for the items in AI dependency

AI dependency	Mean ± SD
01. I feel more confident and capable with the assistance of AI in my studies.	**4.10 ± 0.58**
02. I heavily rely on AI tools to support my study-related activities.	3.80 ± 0.81
03. AI has significantly influenced my educational choices and decision-making processes	3.72 ± 0.84
04. AI has transformed the way I approach learning and problem-solving tasks.	3.86 ± 0.67
05. I believe AI has positively impacted my overall educational journey	3.93 ± 0.69
06. I feel that AI has improved the quality of my learning outcomes.	3.95 ± 0.67
07. AI has become a trusted source of information and guidance for me.	3.71 ± 0.69
08. I actively seek out AI-powered tools and resources to enhance my learning experience.	3.91 ± 0.64
09. AI has increased my efficiency and productivity in academic tasks.	3.90 ± 0.63

The overall impact score ranged from 122 to 255 (Mean = 188.54, SD = 22.868), reflecting a generally positive influence of AI on higher education. These findings highlight AI's transformative role in shaping modern learning environments while raising important considerations about dependency and self-reliance (Table 8).

DISCUSSION

AI is now widely used by students around the globe to fulfill their educational purposes. This study provides compelling evidence of the widespread adoption and generally positive attitudes toward AI among nursing students across three Sri Lankan Nursing Schools. The findings offer valuable insights into how AI is transforming nursing education and raise important considerations for educators and

policymakers. The near-universal adoption rate (95.5%) demonstrates that AI tools have become fundamental to contemporary nursing education. Particularly striking is the dominance of ChatGPT (95.5% usage) (Table 2), suggesting generative AI has rapidly become the gateway technology for students [20]. The frequency data reveals a bifurcation in usage patterns - while 83.6% of students are core users (daily or several times weekly), indicating deep integration into study routines, a smaller but significant minority (15.5%) use AI only occasionally or situationally (Table 2). This pattern suggests AI is both a constant companion for most students and a specialized tool for others. In terms of using AI tools, Productivity tools (like language and organization apps) are popular (54–73% usage), showing students value efficiency (Table 3). Only 7.4% of students struggle with adapting to technology, as modern AI tools are user-friendly. The presence of both beginners and experts suggests variability in digital literacy, which could influence how AI is adopted across different student subgroups. Institutions may need to tailor AI training programs to address gaps for less proficient users while leveraging advanced students as peer mentors.

The results from the Student Attitude Toward Artificial Intelligence (SATAI) scale provide valuable insight into nursing students' perceptions and openness toward the use of AI in higher education. Overall, the findings revealed a strongly positive attitude among students across emotional, behavioral, and cognitive components, with the cognitive domain achieving the highest mean score (3.91) (Table 4). This suggests that students intellectually recognize the importance and relevance of AI in their educational journey and are increasingly aware of its transformative potential in learning environments. This aligns with previous study which states that AI has transformative ability [21]. The positive trend extended to the behavioral (3.76) and affective (3.70) domains (Table 4), indicating that students not only believe in the importance of AI but are also willing to engage with AI-driven activities and hold generally favorable emotional sentiments towards it. The high mean score for the statement, *"It is interesting to use AI"* (4.12), further underscores students' enthusiasm and curiosity, signaling that AI technologies are seen as engaging and appealing educational tools.

However, a notable area of ambivalence emerged regarding AI's direct relevance to future career aspirations. The neutral responses to the statement, *"I will choose a job in the field of AI,"* suggest that while students are open to learning with AI and incorporating it into their studies, they remain uncertain about pursuing AI-centric careers. This hesitation may stem from a lack of clarity about how AI will integrate into traditional nursing roles or concerns about AI replacing human elements in healthcare practice. It also highlights a potential gap in career guidance that could be addressed through targeted counseling and curriculum integration focused on AI's growing relevance across diverse healthcare sectors. When examining the overall distribution of SATAI scores, a strong pattern of positivity was observed. The majority of students (78.9%) fell within the Positive to Moderately Positive ranges (86–115), and only a very small fraction (1.4%) expressed negative attitudes (Table 5). The clustering of 42.6% of students in the Moderately Positive range (101–115) suggests cautious optimism—students are largely supportive of AI's role in education, but many may still harbor some reservations about overreliance, ethical concerns, or the rapid pace of technological change (Table 5).

Interestingly, the secondary cluster in the Positive range (86–100; 36.3%) (Table 5) reflects another significant group showing favorable but slightly more measured enthusiasm, possibly indicating that while students recognize AI's benefits, they also value traditional educational methods and human interaction. The presence of a small negative group (1.4%) further emphasizes that while acceptance is strong, educators must remain mindful of differing comfort levels with technology (Table 5). Some students may be skeptical about AI due to ethical concerns, lack of exposure, or a strong preference for conventional learning approaches. Addressing these concerns through transparent discussions about AI limitations, ethical practices, and safe application within healthcare could support more inclusive acceptance.

Our findings revealed that AI significantly enhances students' confidence and perceived capabilities. This finding aligns with prior research from China [22], which emphasizes that AI can assess individual needs and deliver personalized content, thereby improving knowledge uptake and retention. When examining the seven dimensions of AI's impact, AI dependency emerged with the highest mean score (3.87), suggesting that while students benefit from AI support, there is a growing reliance on these tools for academic tasks (Table 6). This also aligns with a study done in China [23] which highlights that AI dependency significantly has an impact on the education and development of 21st century skills. This observation highlights the need for AI literacy programs that not only teach students how to use AI effectively but also educate them about responsible usage and the potential risks of overreliance. Furthermore, the mean values across other dimensions, including Social Interaction (3.68), Career Guidance (3.66), Academic Performance (3.85), Learning Experience (3.59), Self-Reliance (3.53), and Motivation (3.61), reflect a broadly positive perception of AI integration, reinforcing the potential for AI to significantly enrich higher education environments (Table 6). This aligns with a study in Australia which suggests that students reported more positive thoughts in integrating AI into classroom [24]. However, the relatively lower score for self-reliance (3.53) (Table 6) underscores concerns that students may lose critical independent learning skills if AI usage is not properly managed. This aligns with previous studies, which emphasize that the transformative potential of AI in education requires AI literacy, prompt engineering skills, and the development of critical thinking [25], [26]. Given these findings, there is a clear need for balancing AI and traditional skills. While AI tools improve efficiency and academic outcomes, they should not replace foundational skills such as critical thinking, independent research, and clinical decision-making. Past studies suggests that blended learning should be there in the classroom [21]. Structured reflection exercises, simulations with and without AI support, and assignments that require independent problem-solving can help maintain this balance. In light of students' high trust in AI outputs, as indicated by statements such as "AI has become a trusted source of information and guidance for me" (mean = 3.71), there is a pressing need for curriculum integration that emphasizes verification of AI-generated content. Formal AI instruction should be systematically embedded throughout nursing programs, incorporating discipline-specific tool training to ensure students are prepared to assess and critically appraise AI outputs.

This study had several limitations that should be considered when interpreting the findings. The inclusion of final-year state diploma nursing students from the Western Province limits the

generalizability of the findings to nursing students from other academic years and private institutions in Sri Lanka. The rapidly evolving nature of AI can change the patterns of AI use, available tools and institutional practices over time, potentially limiting the temporal relevance of the findings. The study might not have fully captured institutional factors, including AI related policies and formal training in responsible AI use. Future longitudinal and multicentre studies with objectives measuring the use of AI, educational and clinical performance outcomes are recommended to address these limitations.

CONCLUSION

This study reveals that AI plays a transformative yet complex role in nursing education. ChatGPT is the most prevalent AI tool in higher education, followed by language and productivity aids. While AI enhances efficiency, the low adoption of specialized academic tools suggests untapped potential. While students overwhelmingly embrace AI for its confidence-boosting and efficiency benefits, educators must guide this adoption to prevent over-dependence and preserve critical thinking skills. Future success will depend on students finding the right balance between embracing AI's potential and maintaining the human-centered essence of nursing practice.

These students are preparing to enter professional nursing practice, strengthening their competencies in the responsible and effective use of AI is important for both nursing education and future healthcare delivery. Nursing education in institutions and policy makers should consider incorporating AI literacy, ethical AI use and appropriate use of AI in the curriculums. Future research should explore the long-term effects of AI dependency and strategies to optimize AI's role in education without compromising foundational skills. Future research can include mixed methods to explore usage contexts, investigate the patient care impacts of AI-dependent learning.

Abbreviations

ChatGPT
Chat Generative Pre-trained Transformer
AI
Artificial intelligence
SATAI
Student Attitude Toward Artificial Intelligence scale

Declarations

Ethics approval and consent to participate -

Ethical approval for the study was obtained from the Ethics Review Committee of the Faculty of Medicine University of Colombo (Committee reference no. EC-24-122). The Helsinki Declaration guidelines were followed in this study.

Consent for publication – Not Applicable

Data availability statement - The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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