# THE INFLUENCE OF CHATGPT ON THE LEARNING OUTCOMES OF NURSING STUDENTS: CROSS-SECTIONAL STUDY IN ISLAMABAD

Muhammad Aaqib[*1], Naureen Fazal[2], Saira Abbas[3], Atia Bibi[4],
Hafiz Muhammad Kaleem Ullah Shah[5], Usman Farooq[6], Laiba Kainat[7], Elisha Anwar[8],
Alexander Francis[9]

[*1]*Rawal College of Nursing, Islamabad, Pakistan*

[*1]aaqibhaxxan732@gmail.com

## Abstract

Artificial Intelligence, especially ChatGPT, has quickly become a useful tool for learning in nursing education because it makes things clearer, more interesting, and easier to learn on your own. There is inadequate information regarding its effectiveness among nursing students in Pakistan.

**Objectives:**

The goal of this study was to find out how ChatGPT affects nursing students' academic performance and educational outcomes, as well as the pros and cons that students think about when using it.

**Methodology:**

A descriptive cross-sectional study was conducted with nursing students from four colleges affiliated with Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad.
A convenience selection strategy was employed to select 184 students from the 3rd, 4th, and 6th semesters. Data were gathered using a standardized, validated questionnaire and subsequently analyzed with SPSS version 27. Descriptive statistics summarized participant characteristics, while Chi-square and Fisher's exact tests assessed the relationships among variables.

**Results:**

Most of the people (72.3%) said they had used ChatGPT before mostly for schoolwork, predominantly for academic objectives (62%). A total of 93.5% thought that ChatGPT had helped them do better in school, and there was a strong link between how helpful ChatGPT was seen to be and how well students could connect management ideas to both their schoolwork and their jobs ($p < .001$). Men rated ChatGPT a little higher for understanding real-world situations ($p = .001$).

**Conclusion:**

ChatGPT helped nursing students learn more about theory and get better grades. Although it significantly enhances conceptual comprehension, over-reliance and accuracy concerns highlight the imperative for ethical implementation and integration with experiential learning to promote a balanced, competency-oriented nursing education.

## 1. Introduction:

New ideas in education should always aim for ongoing progress and the ability to adapt [1, 2]. In higher education, innovation means using new ideas that bring about important changes in how people teach and learn which in turn helps them reach their educational goals and get better results [1, 3, 4]. Artificial intelligence is a kind of computer system that can make decisions, suggestions, and predictions that change the real or virtual world based on want people want [5, 6]. Machine learning algorithms and natural language processing models are two examples of AI-powered tools that are now commonly used in medical and health sciences education to help students learn better. ChatGPT, which came out in November 2022, is an exciting new technology that helps students by giving them text-based answers, making it easier for them to understand, and giving them feedback right away [7, 8]. In nursing, it has become as an important tool that makes work more efficient, encourages personalized care, and makes it easier for people to get health care [9, 10,11]. These technologies are becoming more and more recognized as important parts of new ways of teaching that help people learn more and improve their skills [1]. ChatGPT has turned into a virtual academic helpers that give students advice and support with their schoolwork [12]. ChatGPT and other text-based language models can create simulated learning environments that let nursing students practice and improve skills like making decisions, talking to people and solving problems in a virtual or academic setting [13, 14, 15]. ChatGPT creates safe, easy-to-reach, and open virtual classrooms that inspire people to learn and stay motivated [16]. ChatGPT has done well in both nursing school and in the actual world. For instance, it can make paperwork easier by making nursing phrases and language the same for everyone which saves time and effort [17]. Studies done in Spain and Palestine show that most nursing students thought ChatGPT was helpful for doing homework and doing better in school [1,7]. They are beneficial; however, there are a few problems. People are apprehensive about how reliable, accurate and safe it is in schools and hospitals because it was trained on a lot of data from the internet [18]. Differences between training data and real-life clinical scenarios can cause bias, misinformation, or "hallucinations," which can make patient treatment less safe and fair [8, 6, 19]. Students might not be able to think for themselves or make good decisions if they use ChatGPT too much. Individuals are worried about academic honesty since AI is making more and more material, and it can be hard to distinguish the difference between work done by people and work done by AI [20]. Some people, on the other hand, are apprehensive about how trustworthy ChatGPT is since it might not always deliver new, or consistent information. This is highly critical in healthcare since patients' safety and the quality of care could be at danger if they don't get the right information [21, 22]. ChatGPT is currently being developed for application in nursing education in Pakistan. Many students already use it to do homework, make care plans, and learn about different subjects. However, there isn't much information regarding how it influences learning outcomes and academic success, both good and poor. This study aims to evaluate the influence of ChatGPT on the academic performance of nursing students in Islamabad. It mainly wants to know how it affects students' grades and to make a list of the primary positives and negatives of adding it into nursing education. The results will help nursing schools in Pakistan figure out how to use AI-assisted learning technology in a safe, ethical and useful way.

## Methodology

### 2.1. Study Design and Setting

The research employed a descriptive cross-sectional design conducted at four nursing colleges affiliated with Shaheed Zulfiqar Ali Bhutto Medical University (SZABMU), Islamabad, Pakistan. The main purpose of the study was to know how ChatGPT influenced the grades of the nursing students and their perception of it as a way to learn.

### 2.3. Participants:

The students who took part in this research study were from third, fourth and sixth semesters enrolled at four nursing colleges associated with Shaheed Zulfiqar Ali Bhutto Medical University SZABMU. Slovin's approach ($n = N / (1 + Ne^2)$) with a 5% margin of error was used to calculate a sample size of 200 students. During data collection, the sixth semester was inaccessible at one of the colleges. As a result, data were gathered from 184 students who were eligible to take part. Nursing educators, staff, and students who chose not to participate or were unavailable during data collection were excluded.

### 2.4. Research tool:

We used a structured questionnaire based on the validated tool used by González-García et al. (2024) in their research "Impact of ChatGPT Usage on Nursing Students' Education" to gather data. There were three parts to the assessments that were meant to find out how nursing students felt about ChatGPT in terms of how it helped them learn and make progress in school. The first part gathered biographical data and was very consistent with itself (Cronbach's $\alpha$ = 0.87). In the second segment, we learnt how students felt using ChatGPT as a learning tool and how it changed their grades and readiness for work, with a Cronbach's $\alpha$ value of 0.79, which was reliable. The final section focused on how satisfied the pupils were with the usage of ChatGPT and what problems they expected with it. The main focus of it was on the motivating factors and was much reliable (Cronbach's $\alpha$ = 0.89).

### 2.5. Ethical Consideration:

Before data collection started, all the eligible participants gave their written consent. The objectives of the study were made clear to all the participating individuals. They were also informed that they can quit the study at any point without any penalty or punishment whenever they want to. The identities of all the individuals taking part in the study were kept private and were only accessible to the research team. The collected data was only used for research purposes. The permission to continue the research was given by the Institutional Review Board (IRB) of Rawal Institute of Health Sciences (RIHS).

## 3. Data Analysis:

Data analysis was done using SPSS version 27. Descriptive statistics were employed, which included frequencies, percentages, means and standard deviations to describe the participants' demographics and their responses to the study variables. The chi-square test was used by us to look at how categorical variables were related to each other. The Fisher's exact test was performed to make sure that the p-values were correct when there were fewer cells predicted. A P-value below 0.05 was considered statistically significant.

## 4. Result

### 4.1. Participants sociodemographic characteristics

184 nursing students were included in the study. Most of them (78.8%) were between the ages of 20 and 25 with an average of 1.80 (SD = 0.42, coded scale). The students were enrolled in the 3rd (36.4%), 4th (36.4%), and 6th (27.2%) semesters. 63% of the people who took part were men, 35.9% were women, and 1.1% did not say what gender they were. In terms of work, 81.5% were full-time students, 16.8% worked part-time while going to school, and 1.1% worked full-time. Most of them did fairly well in school, with GPAs ranging from 3.0 to 3.5 (40.8%) and 3.5 to 4.0 (38.6%). The average GPA was 3.38 (SD = 0.85). Table 1.

*Table 1*
*Sociodemographic data*

| Characteristic | Value | N | % | Mean | S.D |
|---|---|---|---|---|---|
| Age | <20years<br>20-25 Years<br>>25Years | 38<br>145<br>1 | 20.7<br>78.8<br>.5 | 1.80 | .415 |
| Semester | 3rd Semester<br>4th Semester<br>6th Semester | 67<br>67<br>50 | 36.4<br>36.4<br>27.2 | 1.9076 | .79420 |
| Gender | Male<br>Female<br>Prefer not to say | 116<br>66<br>2 | 63<br>35.9<br>1.1 | 1.3804 | .50877 |
| Employment Status | • Full time Student<br>• Student and part time worker<br>• Student and full time worker | 150<br><br>31<br><br><br>2 | 81.5<br><br>16.8<br><br><br>1.1 | 1.2065 | .46841 |
| Average academic performance (GPA) | Less than 2-2.5<br>2.5-3<br>3-3.5<br>3.5-4 | 3<br>22<br>75<br>71 | 1.6<br>12.0<br>40.8<br>38.6 | 3.3750 | .84648 |

### 4.2. Previous use of chat gpt

The results show that a large number of respondents, 72.3%, have used ChatGPT before. Of the multiple capabilities, academic purposes accounted for 62.0%, suggesting that students mostly employ ChatGPT for educational support. Moderate levels of use were seen for general information retrieval at 42.9%, image generation at 44.6%, and content creation at 34.8%, which shows that people were equally interested in both educational and artistic activities. On the other hand, just 34.2% of people used ChatGPT to solve problems, 22.8% for making videos, and 11.4% to make music. These numbers are all rather low. The findings show that ChatGPT is utilized a lot, but largely in academic and informational settings, not in creative or multimedia domains. (Table 2).

*Table 2:* **Frequency of chatgpt and content generation tools usage before the course.**

| Functionality | Frequency of use (%) |
|---|---|
| Prior chat use | 72.3% |
| Academic use | 62.0% |
| Content generation | 34.8% |
| General information | 42.9% |
| Problem-solving use | 34.2% |
| Image generator | 44.6% |
| Video generator | 22.8% |
| Music generator | 11.4% |

### 4.3. Perceived improvement in academic performance

One hundred eighty-four people said they thought their academic performance had improved. Most of the people who answered had a positive effect. Seventy-four individuals (40.2%) said their performance had improved a lot, and ninety-eight people (53.3%) said it had improved a little. A limited number of people indicated that nothing changed 5 (2.7%) or that it hurt their performance 2 (1.1%). Additionally, 5 participants, representing 2.7%, expressed uncertainty about any changes. Overall, 93.5% of respondents thought that ChatGPT had a positive effect on their academic success, showing that the effect was mostly positive (Table 3). Both male and female nursing students found ChatGPT useful for learning, with the only notable difference between how well they understood practical situations. Male respondents ranked ChatGPT marginally higher than female respondents for understanding course topics, 46.6% and 42.4%, and content comprehension, 69.8% and 65.2%, respectively. However, a markedly higher percentage of females (87.9%) compared to males (70.7%) considered ChatGPT ineffective for understanding practical situations (p = .001). there were no significant differences in exam preparation (p = .250) or in the completion of assignments (p = .781). (Table 4)

*Table 3*: Perceived improvement in academic performance

| Response | Frequency | Percentage % | Cumulative percentage % |
|---|---|---|---|
| Yes, significantly | 74 | 40.2 | 40.2 |
| Yes, to some extent | 98 | 53.3 | 93.5 |
| No, no changes | 5 | 2.7 | 96.2 |
| No, it hindered my performance | 2 | 1.1 | 97.3 |
| I am not sure | 5 | 2.7 | 100 |

*Table 4*: Perceived usefulness of chatgpt for academic concepts

| Variable | Gender | Very useful % | Useful % | Neutral % | Slightly useful % | Not useful % | *p* value (Fisher) |
|---|---|---|---|---|---|---|---|
| Useful for understanding course concepts | Male 116 | 46.6 | 34.5 | 12.9 | 5.2 | 0.9 | .306 |
| | Female 66 | 42.4 | 51.5 | 6.1 | 0 | 0 | |
| Content comprehension | Male 116 | 69.8 | 0 | 0 | 0 | 30.2 | .697 |
| | Female 66 | 65.2 | 0 | 0 | 0 | 34.8 | |
| Understanding practical cases | Male 116 | 29.3 | 0 | 0 | 0 | 70.7 | .001 |
| | Female 66 | 12.1 | 0 | 0 | 0 | 87.9 | |
| Exam preparation | Male 116 | 47.4 | 0 | 0 | 0 | 52.6 | .250 |
| | Female 66 | 42.4 | 0 | 0 | 0 | 57.6 | |
| Completing assignments | Male 116 | 49.1 | 0 | 0 | 0 | 50.9 | .781 |
| | Female 66 | 54.5 | 0 | 0 | 0 | 45.5 | |

### 4.4. Perception of usefulness of chatgpt

The relationship between students' reported utilization of ChatGPT and their ability to implement management concepts in both theoretical and practical contexts was analysed. The table shows that there are statistically significant links between both variables. Students who perceived ChatGPT as beneficial for understanding and implementing management principles in the course (p < .001) also reported notable improvements in their academic performance (p < .001). The results show that ChatGPT greatly improves students' understanding of management theories and how to use them in real life, which has a big effect on the entire learning experience. (Table 5)

*Table 5*: **Perception of academic performance improvement and perceived usefulness.**

| Cross variable | Pearson Chi-Square | Degree of freedom (df) | Significance (p-value) | Likelihood ratio | Linear-by-Linear Association | Number of valid cases |
|---|---|---|---|---|---|---|
| Usefulness of chatgpt * Relating management concepts (course) | 93.769 | 16 | <.001 | 70.772 | 22.020 | 184 |
| Usefulness of chatgpe * Relating management concepts (practice) | 40.148 | 12 | <.001 | 36.104 | 6.483 | 184 |



*Figure 1*

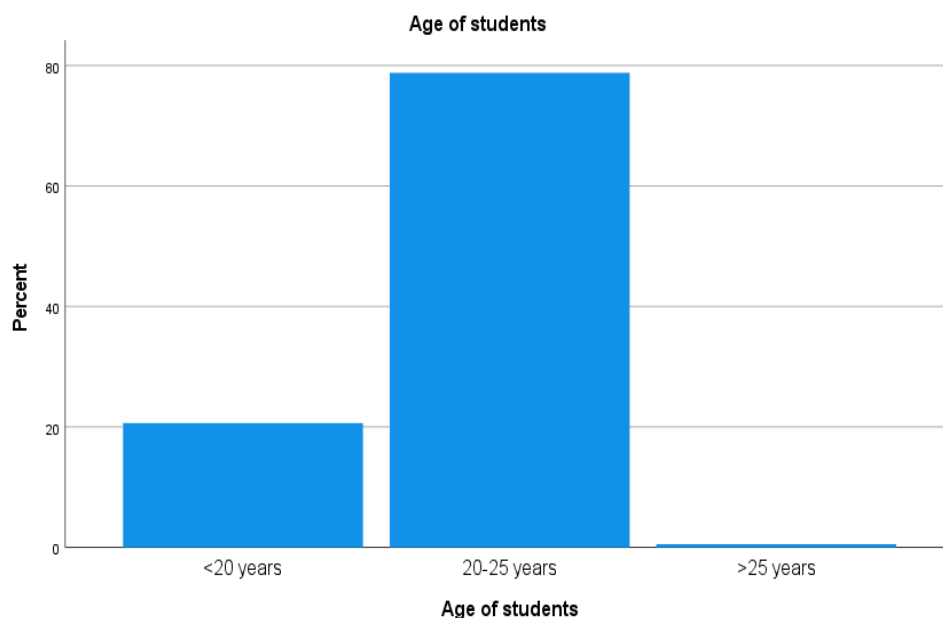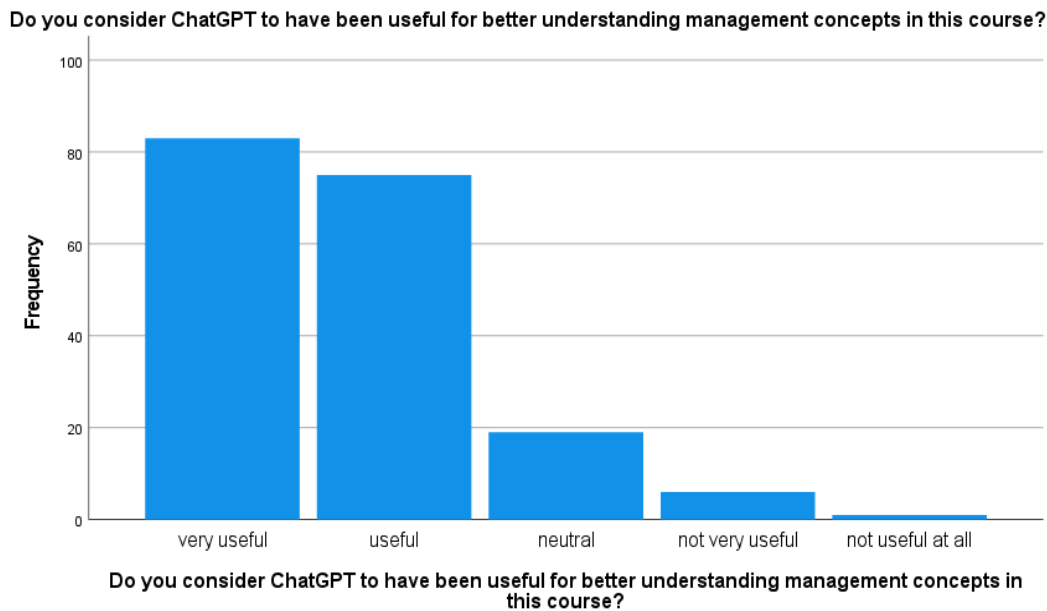**Do you consider ChatGPT to have been useful for better understanding management concepts in this course?**

*Figure 2*

## 2.  Discussion

This study examined the influence of ChatGPT on the perceived academic success of nursing students in four nursing colleges of Islamabad affiliated with SZABMU. The results showed a positive impact of ChatGPT usage as a learning tool in improving academic performance and comprehending the concepts more clearly. A majority of students, 72.3% said that they have already used ChatGPT, 62.0% mainly for academic purposes. This percentage reflects that there is an increase in the use of AI-assisted technologies in nursing education. The same findings were also reported by a previous research conducted by González-García et al. (2024) [1], which showed that 89.5% of students in Spain believed that ChatGPT enhances their academic performance. Research conducted by Salama et al. (2025) [7] also found that more than 80% of the Palestinian students showed positive attitudes towards the incorporation of AI-assisted tools in nursing education. The consistent results across different regions of the world showing the positive attitude regarding the addition of such tools in nursing education highlights the growing acceptance of AI tools among nursing students globally. In this study, 93.5% respondents stated

that ChatGPT enhanced their academic performance, 40.2% stated significant enhancement, and 53.3% stated enhancement to some extent, while only 2.7% noticed no change and 1.1% reported a negative impact. This supports earlier findings that ChatGPT helps in assignment preparation, better understanding of concepts and preparedness for exams. The results of Chi-square test revealed that there is a significant correlation between the perceived usefulness of ChatGPT and the ability of the students to apply management concepts in both academics ($p < .001$) and clinical ($p < .001$). However, the stronger association was seen for theoretical comprehension rather than practical application. This suggests that ChatGPT is more useful in improving conceptual learning than clinical reasoning. This finding corresponds with Zhou (2024) [8], who emphasized that the improvement of theoretical understanding by the use of AI-tools is acceptable but their accuracy and application to real-life contexts still require cautious evaluation. Gender-based evaluation suggested that both male (63%) and female (35.9%) students found ChatGPT useful for coursework. However, males reported greater usefulness in practical cases ($p = .001$). This

variation may be due to differences in learning preferences, prior use of digital technologies, or level of experience with AI tools. Overall, the perception among both genders was highly positive. This aligns with the global evidence that ChatGPT can be used as an educational assistant if it is used with proper guidance and implemented ethically. Although the study highlights the positive impacts of ChatGPT it also emphasized potential risks, aligning with prior literature. Burhanullah et al. (2025) [23] and Ahmad et al. (2023) [24] highlighted that the excessive dependency on AI tools may reduce critical thinking and can also create ethical dilemmas like plagiarism, leading to questions regarding the accuracy and reliability of the collected data. These concerns were also raised by the participants of this study who acknowledged that ChatGPT is a useful tool but sometimes the information generated by it lacks originality and relevance. In a nutshell, the findings of this study confirmed that ChatGPT is an effective supplementary tool that enhances knowledge, academic motivation, and facilitates self-directed learning among nursing aspirants. However, its limited influence on clinical competencies highlights the pressing need for the balanced incorporation of such tools with traditional teaching and experiential learning. Therefore, the educators and the policy makers should establish clear guidelines that ensure the ethical and responsible use of AI tools, so that such tools assist rather than replacing human reasoning, professional judgment and hands-on practice.

## 3. Conclusion

This study evaluated the impact of ChatGPT on the perceived academic improvement of nursing students. The results of the study suggested that use of ChatGPT as a learning tool improved the knowledge, performance and engagement of the students. The majority of the respondents showed the positive impact of ChatGPT in understanding the topics more clearly and improvement in school performance. These findings indicated that it is a wonderful tool to be used in order to enhance nursing education. Significant connections existed between the perception of students regarding ChatGPT usage and the efficient application of management theories in both academics and real-life scenarios. Despite all these benefits, concerns persist regarding overreliance, ethical dilemmas and accuracy. So, ChatGPT should be used as an optional tool that only assists human thinking, clinical judgment and learning through experience instead of replacing them. The results of the study highlight the fact that nursing students should be educated regarding the safe, responsible and effective use of AI tools like ChatGPT. This could be done by ensuring that the students understand its appropriate usage and establishing guidelines for its application. Future initiatives should focus on improving AI literacy, teaching people how to use AI in an ethical and productive way, and making sure that AI technology fits in with realistic and competency-driven nursing education frameworks.

## 4. Limitations:

Although the study provided useful insight to the use of ChatGPT among nursing students and its influence on their grades, few limitations are also there. The descriptive cross-sectional nature of the study revealed the association between the use of ChatGPT and improvement in academics but it failed to show that one causes the other. Secondly, data collection through self-reported questionnaires, may lead to social desirability or recall bias. The findings of the research are not applicable to every nursing institute as the study was only confined to four nursing colleges of Islamabad associated with SZABMU. The use of convenience sampling may have resulted in the exclusion of the pupils who lack proficiency in technology. Lastly, the study was only focused on the perceived academic success, not objective performance measures like scores in examinations and clinical evaluations.

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