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Impact of Artificial Intelligence on Mental Health: A Cross-Sectional Study Among Tertiary Students

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Abstract

This study investigates the influence of artificial intelligence on the mental health of tertiary students, focusing on the two research questions: What is the extent of mental health among tertiary students, as influenced by AI? And what is the impact of AI on the mental health of tertiary students, regardless of their gender, discipline, or educational levels? The main aim is to assess the impact of AI integration in education on students' mental health. Using a cross-sectional research design, data were collected from tertiary students in Delhi through a Likert scale. The result revealed that there is no significant difference in mental health levels between demographic variables: Gender (Male and Female), Educational level (Graduation, Postgraduation, and PhD scholars), and Discipline (Science, Social Science, and Arts and Humanities). This research offers essential insights into the psychological impact of AI on students. It proposes actionable recommendations to create supportive educational practices that mitigate AI-related stress and enhance mental health outcomes.

Keywords: Mental health, artificial intelligence, tertiary students, cross-sectional

Introduction

"Artificial intelligence (AI) has been around for the past 70 years" (Crawford et al., 2024), "but now becoming a necessary part of many facets of everyday life, having gained popularity swiftly in recent years" (Falebita, 2024). Comprehending the present and its historical influences is essential for accurately assessing probable future outcomes, especially regarding the pervasive integration of AI in society (Sharma et al., 2024). These technologies have unequivocally enhanced our lives by providing ease, connectedness, and efficiency. A swift touch on a screen allows us to seamlessly obtain information, interact with others, and do various tasks (Arslan et al., 2025).

In the field of education, the application of intelligent computer systems that replicate human intelligence, referred to as artificial intelligence (AI). Artificial intelligence (AI) is increasingly assuming a pivotal role in transforming the future of education (Sharma & Singh, 2024). "It has become increasingly prevalent" (Hopcan et al., 2024) "into educational settings marks a significant advancement in detecting, assessing, and nurturing students' emotions" (Vistorte et al., 2024). "By incorporating AI in education, the objective is to enhance the learning process by making it more personalized, adaptive, and effective" (Zhou, 2023). "There are many positive aspects of the possible contributions of artificial intelligence to enabling effective learning" (Webster & Andre, n.d.).

At the heart of AIEd is the scientific goal to "make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit" (Holmes, 2016) also, "AIED is a powerful tool to open up what is sometimes called

the black box of learning" (Holmes, 2016). The integration of AI in higher education has revolutionized teaching methodologies and student experiences; conversely, mental well-being is of utmost significance, and its importance within the context of higher education is indisputable (Zhai et al., 2025). "Increasing the levels of concern for the artificial intelligence effect" (Hopcan et al., 2024) on students' mental health, as the deployment of such technology brings both benefits and concerns. Research indicates that AI can enhance mental health interventions by personalizing learning experiences and providing customized support; yet, it also heightens risks like reliance, legal complications, and increased psychological pressures (Chen et al., 2024). Students face significant social demands and scholastic stress, rendering them particularly susceptible as they adapt to AI-driven systems that impact their social, emotional, and cognitive well-being (Day, 2023).

"The field of mental health care has seen a dramatic change as a result of artificial intelligence (AI), which has produced creative answers to the growing need for mental health assistance"(Dey, 2021). Through specialized interventions, AI technologies such as chatbots, adaptive learning platforms, and mental health apps have demonstrated the potential to reduce anxiety and depression. But the rapid development of smart media also has many negative impacts on the psychological health of college students, such as the uneasiness of personal information leakage, social media anxiety, virtual network addiction, and the worry of employment positions being replaced by intelligence (Yangai Gu, 2023). However, privacy issues, moral dilemmas, and cultural stigmas related to mental health continue to exist, especially in varied educational environments (He, 2024). A study on Chinese college students found that attitudes regarding AI, social norms, and behavioral

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control significantly mediate its impact on academic engagement and mental health outcomes, emphasizing the complexity of these relations (Wang & Wang, 2024). Furthermore, AI applications in public mental health have emphasized their potential to improve efficiency in academic and psychological support systems while also bringing dependency threats (Vyas S, 2024).

This study seeks to investigate the multidimensional impact of AI on tertiary students' mental health, emphasizing four major dimensions: anxiety, academic pressure, social and psychological effects, and coping methods. By investigating these factors, the study hopes to fill knowledge gaps and provide actionable insights for developing inclusive, ethical, and supportive academic environments in which technology and mental health coexist.

Literature Review

Recent advancements in artificial intelligence (AI) language models have enhanced the potential for utilizing conversational AI in mental health assistance, with an increasing volume of literature demonstrating various levels of effectiveness (Rubin M et al., 2025). The swift progression of artificial intelligence has elicited much apprehension regarding its effects on individual mental health, especially within academic environments where students interact with AI-driven tools and technologies. Tian et al., (2025) conducted a study to identify Interpersonal Sensitivity (IS) among college students to facilitate prompt intervention via an AI-based model. The model attained an accuracy rate of 97.81%, illustrating its efficacy in predicting IS and offering important resources for mental health assessment in educational environments. The study of Valarezo-Calero et al., (2025)

identified a positive association between anxiety and technology, emphasizing the reliance on technology for mental health. Chouhan & Saini (2025) examined the disadvantages of AI, including reduced critical thinking and heightened cognitive dependence, and emphasized the need for psychological support. Liberatore et al. (2025) suggests that novel applications of artificial intelligence have raised concerns regarding mental health. Deepfake technology employs artificial intelligence to create counterfeit photos, videos, and audio that appear genuine, potentially available to youth online, which may negatively impact their mental health.

Research Questions

1. What is the extent of mental health among tertiary students, as influenced by AI?
2. What is the impact of AI on the mental health of tertiary students, regardless of their gender, discipline, or educational levels?

Hypotheses

1. The gender of tertiary students does not differ significantly in their level of AI-influenced mental health.
2. The discipline of tertiary students does not differ significantly in their level of AI-influenced mental health.
3. The educational levels of tertiary students do not differ significantly in their level of AI-influenced mental health.

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Methodology

Method

The study seeks to assess AI's influence on tertiary students' mental health. To achieve the objectives, the researcher employed a quantitative cross-sectional survey design.

Population and Sampling

The target population consisted of all tertiary students based on three demographic variables: Gender (Male and Female), Educational level (Graduation, Postgraduation, and PhD scholars), and Discipline (Science, Social Science, and Arts and Humanities) in Delhi. The study used simple random technique to select a total 106 samples.

Tool

A Likert scale in Google Forms was designed for data collection. The Likert scale items were developed based on four dimensions: anxiety about AI, academic pressure, social and psychological effects, and coping strategy. The scale consisted of five statements from each of the dimensions.

Data Collection Procedure

The scale was distributed through WhatsApp groups and social networking sites, LinkedIn, and Facebook, etc, and individually via e-mail. The total number of responses received was 106.

Data Analysis

After completing that data collection, all responses were downloaded from Google Forms and entered into IBM SPSS Statistics version 22.0 for analysis. Data was screened based on the demographic variables, completeness, identifying absent values, and discovering outliers. And finally, 106 samples were selected for analysis that fully completed the Likert scale.

Descriptive statistics such as means, standard deviations, frequencies, and percentages were utilized to summarize the demographic characteristics of participants and assess the distribution of mental health scores.

An independent sample t-test was applied to compare mental health scores based on gender. A. One-way ANOVA was employed to analyze variations in mental health scores among educational levels and academic disciplines. The assumptions of normality and homogeneity of variances were evaluated prior to inferential analyses.

All statistical tests were performed at a significance threshold of $p < 0.05$.

Result

Table 1 illustrates the analysis of the levels of mental health among higher education students affected by AI. Among 106 participants, the majority, 64 students (60.4%), indicated an average level of mental health, suggesting that their mental health is minimally impacted by AI integration. 23 students, representing 21.7%, exhibited elevated mental health scores, indicating significant resilience or minimal adverse effects from AI. In contrast, 19 students, representing 17.9%, reported diminished mental health, signifying substantial issues associated with AI influence.

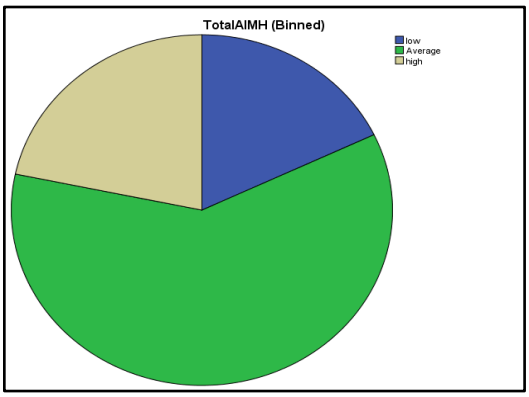
Table 1

Level of AIMH of tertiary students

Level	Frequency	Percent
Low	19	17.9
Average	64	60.4
High	23	21.7
Total	106	100.0

Figure 1

Pie Diagram of the Level of AIMH of tertiary students



Hypothesis-1

An independent sample t-test was used to compare the mental health scores of male and female students. Levene's test for equality of variances revealed a break of the equal variance assumption (P=.004), necessitating the use of the t-test for unequal variances. The findings (t= 0.40 (df=104)) indicated that there is no statistically significant difference (p=.690) in mental health levels between male students (M=62.80, SD=14.506) and female students (M=63.77, SD=10.462). In conclusion, the null hypothesis is upheld, indicating that

gender does not significantly affect mental health levels among tertiary students influenced by AI.

Table 2

M, SD, and t value of AIMH of tertiary students

Gender		N	Mean	SD	t value	Significance
Total AIMH	Male	45	62.80	14.506	0.40	Not Significant
	Female	61	63.77	10.462		

Hypothesis 2

A one-way ANOVA was undertaken to determine if there are significant differences in total AIMS mental health levels among the academic disciplines of science, social science, arts, and humanities. Descriptive data indicated that the mean total AIMH score was lowest for science students (M= 58.71, SD= 11.81) and highest for arts and humanities students (M= 65.42, SD= 11.25), while social science students exhibited intermediate scores (M= 63.57, SD= 13.17). The ANOVA results revealed no significant difference in mental health levels among the three groups F (2, 103) = 2.158, p = .121). This suggests that mean differences exist within disciplines, they are inadequate to demonstrate a significant association between a student's academic discipline and their mental health under the influence of AI.

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Table 3

Summary of Descriptive Statistics for Total AIMH among Tertiary Students Categorized by Discipline

Total AIMH	N	Mean	SD
Science	21	58.71	11.81
Social science	42	63.57	13.16
Arts and humanities	43	65.42	11.25
Total	106	63.36	12.28

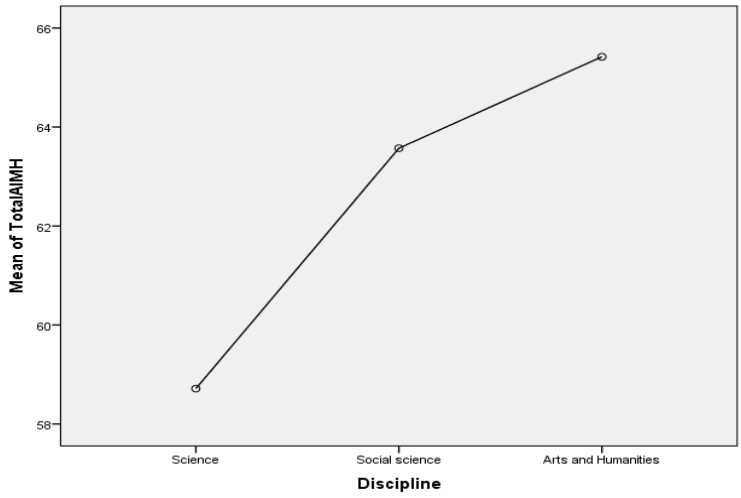
Table 4

Summary of One-way ANOVA on Total AIMH among Tertiary Students Categorized by Discipline

Variance	SS	df	MS	F	Significance
Between-group	637.341	2	318.670	2.158	Not significant
Within group	15213.037	103	147.699		
Total	15850.377	105			

Figure 2

Means Plot of AIMH across Disciplines



Hypothesis 3

A one-way ANOVA was done to assess whether mental health levels (Total AIMH) substantially differ between educational levels (Graduation, Post-graduation, and Ph.D. Scholars). Descriptive data indicated that the mean Total AIMH score was highest for Post-Graduation students (M = 64.47, SD = 11.48), followed by Graduation students (M = 63.58, SD = 13.84), while Ph.D. Scholars recorded the lowest mean score (M = 62.27, SD11.90).

The ANOVA results revealed no statistically significant difference in mental health scores among the three groups, F (2, 103) = 0.302, p = .740. This suggests that while mean differences exist among educational levels, they are inadequate to demonstrate a significant association between a student's educational level and their mental health under the influence of AI.

Table 5

Summary of descriptive statistics for total AIMH among Tertiary Students Categorized by Educational Level

Total AIMH	N	Mean	SD
Graduation	31	63.58	13.837
Post-graduation	34	64.47	11.484
PhD scholars	41	62.27	11.898
Total	106	63.36	12.286

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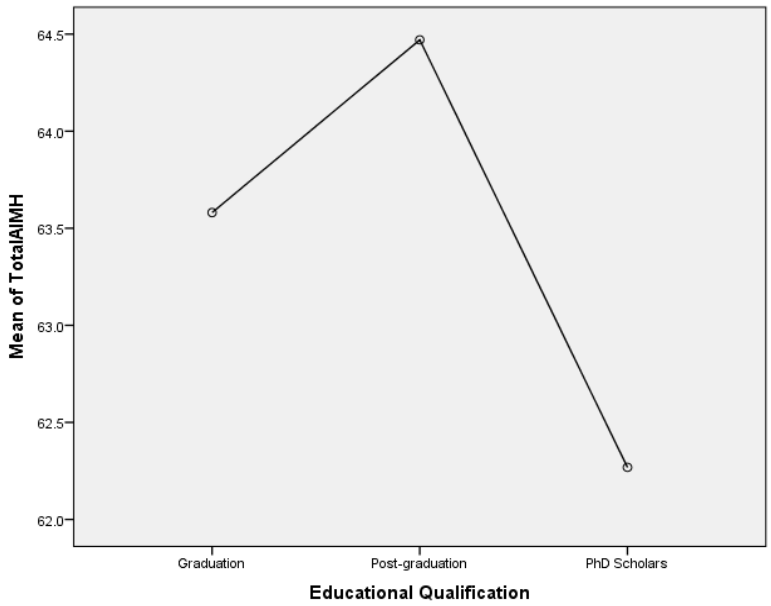
Table 6

Summary of one-way ANOVA on total AIMH among Tertiary Students Categorized by Educational Levels

Variance	SS	df	F	MS	Significance
Between-group	92.310	2	.302	46.155	
Within group	15758.068	103		152.991	Not significant
Total	15850.377	105			

Figure 3

Means plot of AIMH across Educational Levels



Discussion

The study examined the influence of artificial intelligence (AI) on the mental health of tertiary students, based on their gender, educational levels, and discipline. The results revealed significant insights into students' mental health within an AI-enhanced educational setting.

The findings indicated no significant differences in mental health levels based on the gender of tertiary students, aligning with research conducted by Johnson et al. (2024), which identified minimal gender discrepancies in mental health responses to AI-based learning interventions. Other studies, such as Zhang et al. (2024), underscore increased AI-related fear among female students, emphasizing the influence of cultural and contextual elements that necessitate additional exploration.

The data indicated no significant differences in educational levels among graduates, postgraduates, and Ph.D. scholars. This corresponds with the findings of Ghimire & Neupane (2024), which indicated that variations in students' mental health are frequently unrelated to academic levels, but rather affected by resource availability and resilience techniques.

Similarly, the analysis based on academic disciplines revealed no significant differences in mental health among the sciences, social sciences, and arts and humanities students. The findings align with those of Pierrès et al. (2024), who contended that although AI adoption affects all fields, the psychological impact remains consistent due to common exposure to similar stresses, including technological adaptation and academic competition.

Conclusion

This study investigated the impact of artificial intelligence (AI) on the mental health of tertiary students, with a specific focus on significant demographic variables including discipline, gender, and educational level. No significant differences in mental health levels were seen across these groups, suggesting that AI exerts a pervasive influence on students irrespective of their demographic characteristics. Comprehending the psychological impacts of AI in educational environments is essential, as this study highlights the importance of

mitigating potential stressors and fostering students' resilience in AI-enhanced learning contexts.

Future Direction

This study presents multiple opportunities for further research regarding the relationship between artificial intelligence (AI) and mental health in higher education. Longitudinal studies are advised to investigate the enduring psychological effects of AI integration on students, documenting changes over time as technology advances. Secondly, a broader range of samples from various institutions, locations, and cultural settings should be analyzed to improve the generalizability of results and uncover location-specific difficulties. Third, qualitative methods, such as interviews or focus groups, may yield profound insights into students' experiences and coping strategies regarding AI. Ultimately, it is essential to implement and evaluate interventions such as AI literacy programs and mental health workshops to mitigate AI-related anxiety and stress, thereby ensuring that educational systems cultivate resilience and adaptability in students navigating AI-enhanced academic settings.

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