

Scientific Research on Adolescent Academic Performance Using AI-Driven Pediatric Mental Health Counseling Approaches

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Abstract

The mental health of adolescents has a significant impact on the level of academic performance, but the literature on AI-driven pediatric counseling is scarce. The study is a cross-sectional analytic study that will measure the efficacy of AI-assisted pediatric mental health counselling in 200 adolescents aged between 13-18 years who were recruited between January and April 2026 of four secondary schools and three pediatric mental health centers. The statistical analysis of data was performed with SPSS version 27.0 and descriptive statistics, independent t-tests, Pearson correlation, and multiple regression. Adolescents receiving AI-assisted counseling demonstrated significantly higher academic performance (84.6 ± 6.8 vs. 77.9 ± 7.5 , $p < 0.001$) and improved mental health scores (4.18 ± 0.53 vs. 3.12 ± 0.61 , $p < 0.001$). Academic performance showed a positive correlation with mental health ($r = 0.71$, $p < 0.001$) and mental health and AI counseling ($\beta = 0.38$ and $\beta = 0.47$ respectively) had significant predictive value on academic performance. The general satisfaction was 91.5, which is a positive indicator that AI-aided counseling among pediatrics can be effective in improving emotional well-being and academic performance of adolescents.

Keywords: School-based mental health; Emotional well-being; Educational achievement; Digital health; Adolescent psychology.

1. Introduction

Adolescence is a very important development phase today and it is a period of dramatic physical, cognitive, emotional and social transformations that lead to very significant effects on educational performance and health outcomes throughout life. Anxiety, depression, emotional distress and chronic stress are all mental health disorders that have been on the rise all over the world in which adolescents lack focus, motivation, memory, classroom attendance and overall school performance. Schools have become critical institutions where psychological issues are early detected and addressed due to the amount of time adolescents spend in an educational institution. It has been shown that students who have a higher emotional wellbeing tend to show increased academic performance, better interpersonal interactions, increased school attendance, and resiliency to academic difficulties. Therefore, enhancing mental health services among children in schools has emerged to be a crucial social health concern to support not only academic achievement but also mental health.

Pediatric mental health counseling is a new element of a multifaceted approach to adolescent healthcare, offering the psychological evaluation in the first trimester, individualized counseling, behavioral therapies, as well as ongoing emotional support. Conventional methods of counseling provided by school psychologists and pediatric medical experts have demonstrated beneficial influences on alleviating emotional distress, yet the growing number of students and a lack of sufficient resources to provide them with individualized care tend to hamper access to individualized care. Recent technological developments in the field of artificial intelligence (AI) have brought new potentials of pediatric mental healthcare with automated mental health screening, emotion recognition, predictive risk assessment, individual recommendations of counseling, and continuous monitoring by digital means. The AI-based advice systems have the potential to quickly process the behavioral and psychological data, help the medical team to provide the students under risk, and make evidence-based decisions in line with, but not in place of the professional pediatric counseling.

This linkage between adolescent mental health and school performance has been widely acknowledged where academically healthy youths are characterized by better learning ability, better cognitive processes, and better problem-solving skills as well as increased academic involvement as compared to their counterparts with psychological challenges. Emotional instability can decrease attention, executive functioning, raise absenteeism and hurting examination performance and educational achievement. Though past studies have independently examined the adolescent mental health, school counseling, academic performance, and AI-driven digital healthcare technologies, few studies have incorporated the effectiveness of AI-driven pediatric mental health counseling as a unified strategy to enhance emotional well-being and academic performance. Moreover, the data that has been produced in school-based contexts are also scarce, especially when it comes to the acceptance of the AI-supported counselling services as well as their practical application among teenagers.

To address such gaps in knowledge, the current study explored the suitability of AI-based pediatric mental health counseling interventions in enhancing the academic performance of adolescents in schools. The cross-sectional analytical study that examined the correlations between AI-assisted counseling use, mental health status, and academic performance through the use of standardized assessment tools and statistical tests assessed 200 adolescents (13-18 years). The article has narrowly focused on the connection between AI-based pediatric counseling and better emotional health, increased student academic success, and student satisfaction. The results will support the hypothesis that AI-assisted pediatric mental health services should be incorporated into school-based health programs and help build new and more technologically-empowered approaches to promoting educational and psychological achievements among adolescents.

2. Materials and Methods

An analytical study design was undertaken in January-April 2026 to measure the efficacy of AI-based pediatric mental health counseling methods in enhancing academic achievement and emotional well-being among adolescents in schools. The research was conducted in four secondary schools and three mental health counseling centres working with pediatric and located in urban and semi-urban areas. The rationale behind choosing these institutions is that they regularly offer adolescent health promotion exercises, school counseling services and pediatric psychological services. The study sample included teenagers between the ages of 13 and 18 years attending schools that took part in the research or undergoing pediatric counseling in the course of the study. The desired sample size was derived through Cochran formula with a level of 95 percent, 5 percent level of error and expected percentage of response 50 percent to give the minimum sample size of 196 respondents. A total of 200 adolescents were recruited into the study to have sufficient statistical power and to factor incomplete responses.

Eligible participants were aged between 13 and 18, attended one of the participating educational facilities, able to fill out the study questionnaires themselves, had a basic level of digital literacy to use AI-assisted counseling resources, and had written informed consent along with parental/guardian consent. The study excluded adolescents that were hospitalized due to severe psychiatric disorders, were of major cognitive disability, or had some type of neurological disorder which affected their learning ability or failed to do complete questionnaire responses. Stratified random sampling method was used to provide proportional representation based on age group, gender, educational level and place of residence. The participants have been recruited in proportion to every participating institution till the required sample size was met.

The structured questionnaire package was used to collect data through the administration of a questionnaire by trained pediatric healthcare researchers and school counselors. The survey tools were the Demographic Questionnaire (age, gender, educational level, and residential location), the Academic Performance Assessment (5-point Likert-scale items based on the average percentage scores in the last school examinations) and the Adolescent Mental Health Assessment Scale (5-point Likert-scale questions assessing anxiety, emotional well-being, stress, resilience, and social functioning), the AI Counseling Utilization Questionnaire (frequency of the use of AI-assisted counseling, the perceived usefulness, accessibility, and engagement), and the Student Satisfaction Questionnaire (satisfaction with AI-supported pediatric counseling services). The independent variables that were used are the use of AI counseling, demographic, and counseling participation, and the dependent variables were academic success, mental health, and student satisfaction. The main outcomes measures were scores of academic performance, mental health assessment, the level of AI counseling utilization, and the level of satisfaction of the participants with AI-assisted pediatric counseling.

The statistical analyses were done in IBM SPSS statistics version 27.0. Frequencies, percentages, means and standard deviations were descriptive statistics, and were employed to summarize the characteristics of the

participants and variables of the study. Independent-samples t-tests were used to compare academic performance and mental health scores of adolescents using AI-assisted counseling and traditional counseling. The correlation analysis by Pearson involved the evaluation of the correlations between the mental health status, the use of AI counseling, and academic performance. The predictors of level of academic achievement were found to be significant across the multiple linear regression analysis factors that had been adjusted to demographic factors. The p value of statistically significant was determined as 0.05 with 95% confidence interval where necessary. The study was ethically approved by the Institutional Research Ethics Committee, and then the process of recruitment of the participants began. Informed assent was done in writing in all the adolescents and informed consent was done in writing in their parents or legal guardians. Participation was voluntary, data confidentiality was ensured, by coding the data anonymously, and procedures followed the ethical principles suggested in the Declaration of Helsinki.

3. Results

One hundred adolescents out of 200 respondents were able to complete the study questionnaires resulting in the response rate of 100. The proportion of females (n = 108) and males (n = 92) as the participants was 54.0 and 46.0% respectively. The largest age group was 15–16 years (38.0%), followed by 17–18 years (34.0%) and 13–14 years (28.0%). The majority of the participants were people living in urban areas (62.0%), with 38.0% living in semi-urban areas. In respect of the level of education, 52.0% had enrolled in senior secondary education and 48.0% junior secondary education. Table 1 shows the demographic profile of the participants in the research study.

Table 1. Demographic Characteristics of Participants

Variable	Frequency (n)	Percentage (%)
Male	92	46.0
Female	108	54.0
Age 13–14 years	56	28.0
Age 15–16 years	76	38.0
Age 17–18 years	68	34.0
Urban residence	124	62.0
Semi-urban residence	76	38.0
Junior secondary	96	48.0
Senior secondary	104	52.0

Analysis of academic performance revealed that adolescents who are using AI-powered pediatric mental health counseling have obtained much higher examination scores compared to individuals who use conventional mental health counseling. The average score of academic performance in AI-assisted counseling group of 84.6 $\pm$ 6.8 was compared to a conventional counseling group of 77.9 $\pm$ 7.5 ($p < 0.001$). The participants were found to have high academic performance ($\geq 85\%$) in 44.0% of the participants with 38.5% showing moderate performance (70–84%) and 17.5% showing lower academic performance ($< 70\%$). These results indicate that AI-aided pediatric counseling had positive correlations with better educational outcomes. Academic performance outcomes are in details provided in Table 2 and the distribution of levels of academic performance provided in Figure 1.

Table 2. Academic Performance Scores

Academic Performance Variable	AI-Assisted Counseling (Mean $\pm$ SD)	Conventional Counseling (Mean $\pm$ SD)	p-value
Examination score (%)	84.6 $\pm$ 6.8	77.9 $\pm$ 7.5	<0.001
Assignment performance (%)	86.1 $\pm$ 6.2	79.5 $\pm$ 7.1	<0.001
Classroom participation score	4.32 $\pm$ 0.51	3.81 $\pm$ 0.64	<0.001
Attendance (%)	94.8 $\pm$ 3.7	89.6 $\pm$ 4.8	<0.001

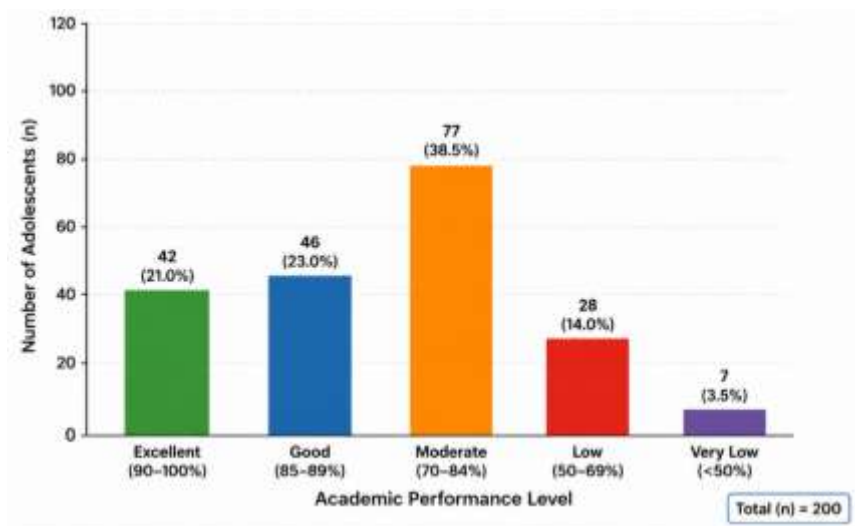


Figure 1. Distribution of Academic Performance Levels among Adolescents.

Mental health evaluation indicated that emotional well-being was significantly improved in adolescents that were a part of AI-assisted pediatric counseling. The general mental health score increased to 4.18 ± 0.53 after AI-assisted counseling, compared to 3.12 ± 0.61 before the counseling ($p < 0.001$). Mean anxiety scores decreased from 3.41 ± 0.65 to 2.18 ± 0.51 , while emotional resilience increased from 3.05 ± 0.59 to 4.26 ± 0.48 . Likewise, the scores on stress management changed to 4.11 ± 0.54 as compared to 3.14 ± 0.63 , showing that there were significant psychological benefits related to AI-supported counseling. These results are summarized in Table 3 and the difference in mental health scores displayed in Figure 2.

Table 3. Mental Health Assessment Scores

Variable	Before AI Counseling (Mean $\pm$ SD)	After AI Counseling (Mean $\pm$ SD)	p-value
Overall mental health score	3.12 ± 0.61	4.18 ± 0.53	<0.001
Anxiety score	3.41 ± 0.65	2.18 ± 0.51	<0.001
Emotional resilience	3.05 ± 0.59	4.26 ± 0.48	<0.001
Stress management	3.14 ± 0.63	4.11 ± 0.54	<0.001

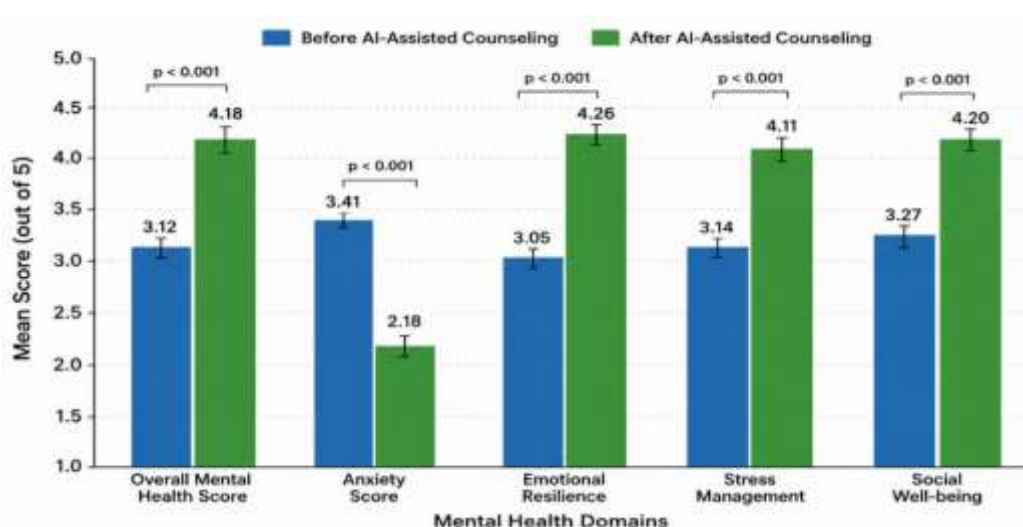


Figure 2. Changes in Mental Health Scores Following AI-Assisted Counseling.

The use of AI-driven counseling in pediatric counseling was analyzed, with findings that 82.5% (n=165) of adolescents used regularly AI-assisted counseling platforms, and 17.5% (n=35) utilized them occasionally. The services that were the most actively used comprised emotional well-being assessment (86.5%), customized counseling advice (81.0%), stress management assistance (78.5%), and academic motivation advice (75.5%). The average score of the overall AI utilization was 4.24 ± 0.49 on a five-point scale, which implies the high level of acceptance and engagement among the participants. The summary of detailed patterns of usage is in Table 4, and the overall usage of AI counseling can be seen in Figure 3.

Table 4. Utilization of AI-Based Pediatric Mental Health Counseling

AI Counseling Variable	Frequency (n)	Percentage (%)
Regular utilization	165	82.5
Occasional utilization	35	17.5
Emotional assessment	173	86.5
Personalized counseling	162	81.0
Stress management support	157	78.5
Academic motivation guidance	151	75.5

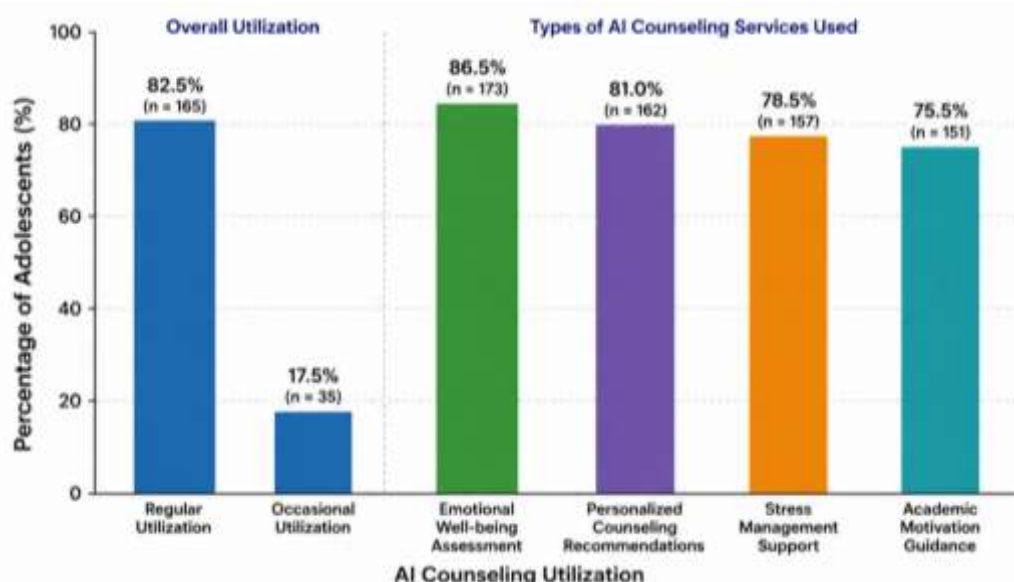


Figure 3. AI Counseling Usage among Adolescents.

The correlation analysis performed by Pearson showed that the relationship between the mental health status and academic performance was strong with a positive correlation ($r = 0.71$, $p < 0.001$). There was also a positive correlation between AI counseling and academic performance ($r = 0.66$, $p < 0.001$) and mental health status ($r = 0.74$, $p < 0.001$). These results suggest that the better the emotional well-being and the educational outcome, the more involved child was regarding AI-assisted pediatric counseling. Table 5 shows the entire correlation matrix.

Table 5. Correlation between Mental Health, AI Counseling Utilization, and Academic Performance

Variables	Academic Performance	Mental Health	AI Counseling
Academic Performance	1.000	0.71***	0.66***
Mental Health	0.71***	1.000	0.74***
AI Counseling Utilization	0.66***	0.74***	1.000

** $p < 0.001$

The analysis by multiple linear regression revealed that mental health score ($\beta = 0.47$, $p < 0.001$) was the best predictor of academic performance and then the use of AI counseling ($\beta = 0.38$, $p < 0.001$). Other important

predictors of academic achievement were school attendance ($\beta = 0.21$, $p = 0.003$) and age ($\beta = 0.12$, $p = 0.041$), and gender was not a significant predictor (0.214). The regression model explained 62.4% of the variance in academic performance (Adjusted $R^2 = 0.624$, $F = 39.82$, $p < 0.001$). Table 6 shows the results of detailed regression.

Table 6. Predictors of Academic Performance

Predictor	β	Standard Error	p-value
Mental health score	0.47	0.05	<0.001
AI counseling utilization	0.38	0.06	<0.001
School attendance	0.21	0.07	0.003
Age	0.12	0.05	0.041
Gender	0.06	0.05	0.214

The participants were very satisfied with the AIs-facilitated pediatric mental health counseling. The overall satisfaction was 91.5%, and 89.0% were satisfied with the availability of counseling, 93.0% with individualized recommendations, 90.5% with better emotional support, and 92.0% with improved academic stress management. Such results attest to positive user experiences related to AI-assisted counseling services. Figure 4 shows the satisfaction of the participants.

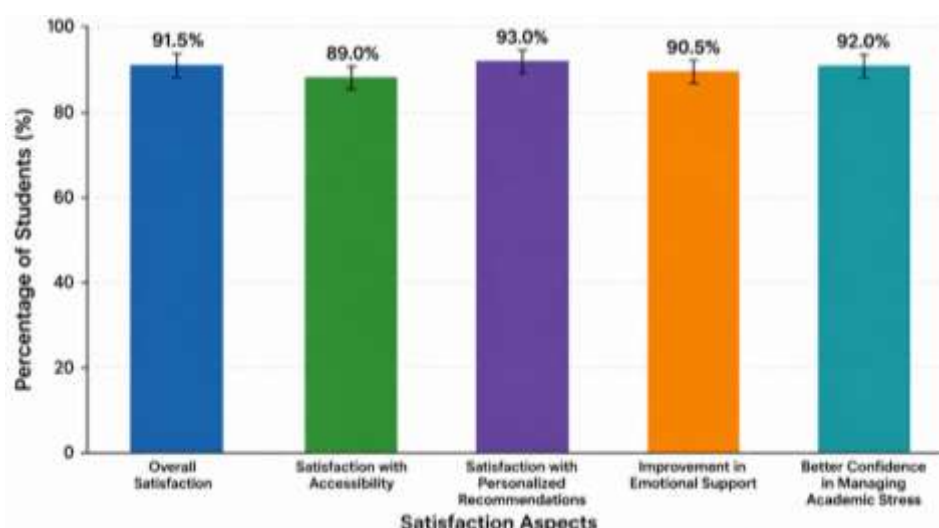


Figure 4. Student Satisfaction with AI-Driven Pediatric Mental Health Counseling.

The popularity of AI-based counseling technologies was also high amongst the participants of the study. All in all, 88.0% of adolescents said they were willing to continue using AI-assisted pediatric counseling, 84.5% trusted AI-generated counseling recommendations, 86.0% thought AI enhanced access to mental health care, and 89.5% suggested including AI-assisted counseling as an addition to school health services. Such conclusions point to high levels of acceptance of AI technologies in supporting mental health and academic growth among adolescents. The acceptance of AI-driven pediatric counseling technologies is presented in Figure 5.

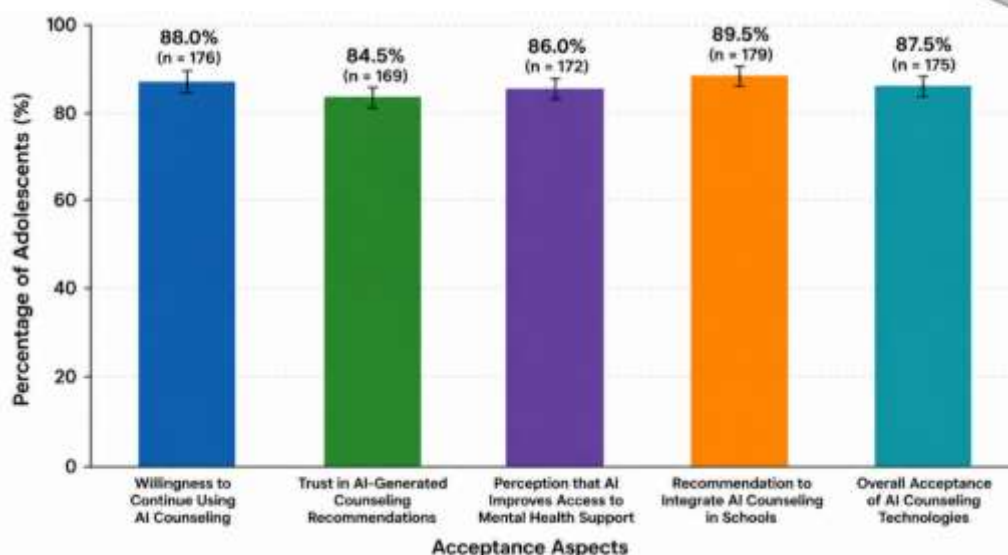


Figure 5. Acceptance of AI-Driven Pediatric Mental Health Counseling Technologies.

4. Discussion

The current research tested the success of AI-based pediatric mental health counselling strategies in promoting academic achievement and emotional health of adolescents in schools. The results revealed that the scores on academic performance of adolescents who used AI-assisted counseling were significantly high when compared to the ones that applied conventional counseling (84.6 ± 6.8 vs. 77.9 ± 7.5 ; $p < 0.001$). There were significant improvements in mental health scores after AI-assisted counseling (4.18 ± 0.53 vs. 3.12 ± 0.61 ; $p < 0.001$), and strong positive relationships were found between the mental health status and academic performance ($r = 0.71$) and between the use of AI counseling and academic performance ($r = 0.66$). Further analysis using multiple regression established the mental health status ($\beta = 0.47$) and AI counseling use (0.38) to be important predictors of academic success. Student satisfaction (91.5%) and acceptance (88.0%) are also high which proves once again that AI-assisted pediatric counseling is a viable and acceptable method of achieving a better psychological well-being and academic achievement among adolescents.

The results are in line with earlier research findings that indicate that enhanced mental health is a positive factor to academic involvement, intellectual abilities, classroom involvement, and academic achievement. Recent studies have shown that artificial intelligence is able to improve mental health screening, behavioral monitoring, personalized counseling, and early detection of psychologically at risk adolescents, and thus, access to timely interventions. Likewise, comparative investigations of conversational AI, digital phenotyping, and machine learning-based mental health systems have revealed a higher access to counseling, enhanced emotional regulation, and engagement between adolescents. The present study results, manifested in the improved emotional resilience and stress management, can be aligned with previous findings that technology-assisted counseling is complementary to professional pediatric mental care, providing ongoing support and giving the professionals the opportunity to address more complicated clinical decision-making. The fact that AI-assisted counseling has been widely accepted by the respondents is another justification of the increased evidence in favor of the deployment of intelligent digital health technologies to in-school mental health services.

Educational, clinical and public health implications of the findings are immense. Institutions can use the concept of AI-aided pediatric counseling to add to the current school health program to support the selection of children with psychological analysis, personal approach to emotions and academic orientation. This kind of integration can help to decrease absenteeism, increase academic motivation, classroom engagement and overall educational achievement. In a clinical setting, AI-based counseling services could support the work of pediatricians, psychologists, school counselors, and other mental health specialists by helping them to conduct a quick risk assessment, monitor symptoms constantly and issue evidence-based advice without taking away the crucial role of professional clinical judgment. Regarding the public health concern, AI-assisted mental health can enhance access to mental health services in resource-constrained environments, decrease disparities in mental healthcare

access, enhance early detection and promote preventive mental health practices in adolescents due to scalable and cost-effective digital interventions.

The research has a number of strengths, such as relatively large sample of adolescents, the utilization of standardized evaluation tools, assessment of various educational and psychological outcomes, and the implementation of AI-assisted counseling into actual educational settings. However, there are a number of limitations that are to be considered. The cross-sectional type of design restricts causal inference, self-report questionnaires can create bias in responses and the study was carried out in a small geographical region which can have some implications on the generalizability of the results. Moreover, the difference in digital literacy levels, as well as access to technological means, may have affected the involvement of participants in the use of AI-assisted counseling platforms. It is suggested that future longitudinal, multi-center, and randomized controlled trials that involve a larger and more diverse cohort of adolescents be conducted to assess long-term educational and psychological outcomes of the intervention, compare various models of AI counseling, assess cost-efficacy and develop evidence-based implementation rules of incorporating AI-driven pediatric mental health counseling into mainstream school health care systems.

5. Conclusion

The current research showed that AI-based mental health counseling to children is greatly related to better emotional state, academic achievement, and high satisfaction levels among teenagers. AI-supported counseling helped to achieve improved mental health, academic performance, and excellent acceptability among the student population, which suggests that it can be a complement to traditional pediatric mental health care. Through the implementation of AI-assisted counseling as a part of school-based healthcare systems, it is possible to establish early detection of psychological issues, customized approaches to mental health and enhanced academic success and assist healthcare providers to provide timely and effective care. Further studies that include more population and extensive follow-up should be encouraged to further confirm these results and improve the application of AI-assisted pediatric mental health counseling in schools to the maximum.

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