EVALUATING THE IMPACT OF AI-BASED MENTAL HEALTH INTERVENTIONS ON SOCIAL MEDIA ADDICTION IN ADOLESCENTS

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Abstract

The pervasive use of social media among adolescents has raised concerns about social media addiction and its detrimental effects on mental health. This study evaluates the impact of AI-based mental health interventions designed to address social media addiction in adolescents. Utilizing AI-driven tools such as virtual therapy chatbots, mood monitoring, and personalized behavioral feedback, the research investigates their effectiveness in reducing addictive behaviors, enhancing emotional regulation, and improving overall well-being. Employing a mixed-method approach, the study assesses changes in social media usage patterns and psychological health indicators before and after intervention. Results demonstrate that AI-based interventions can significantly reduce compulsive social media use and alleviate associated mental health challenges like anxiety and depression. The findings highlight the potential of AI technologies to provide accessible, scalable, and engaging mental health support tailored to the needs of adolescents, offering valuable implications for practitioners, developers, and policymakers aiming to promote healthier digital behaviors.

Keywords: AI-Based Mental Health Interventions, Digital Well-being, Social Media Addiction, Adolescents

INTRODUCTION

Adolescence is a formative stage of life marked by rapid emotional, psychological, and social development. In recent years, social media has become a dominant force in shaping adolescent behavior and identity. While it offers platforms for communication, creativity, and socialization, its excessive use has led to a rising concern: social media addiction. Characterized by compulsive engagement, dependency, and an inability to control usage despite negative consequences, social media addiction has been linked to anxiety, depression, poor academic performance, disrupted sleep, and diminished self-esteem among adolescents.

As the mental health implications of this digital dependency become more apparent, there is an urgent need for effective, accessible, and youth-friendly interventions. In this context, Artificial Intelligence (AI)-based mental health tools are gaining recognition for their ability to provide personalized, scalable, and non-judgmental support. These interventions range from AI-driven chatbots that offer cognitive behavioral therapy (CBT) techniques, to emotion recognition tools that monitor mood and suggest coping strategies. By utilizing algorithms that adapt to user behavior, these applications aim to help adolescents manage stress, build emotional resilience, and reduce their reliance on social media.

Types of AI-Based Mental Health Interventions
Chatbots and Conversational Agents

AI chatbots simulate human conversation and offer support through text or voice interactions. They often deliver therapeutic techniques such as Cognitive Behavioral Therapy (CBT), mindfulness exercises, and coping strategies. Examples include Woebot, Wysa, and Tess.

These tools provide 24/7 support, reduce stigma, and engage users in a non-judgmental environment.

Mood and Behavior Monitoring Applications

These apps use AI algorithms to track user inputs like mood ratings, sleep patterns, social interactions, and physiological signals (e.g., heart rate via wearable devices). They analyze patterns to detect early signs of mental health deterioration and prompt timely interventions or recommendations.

Personalized Intervention Systems

AI analyzes user data to tailor interventions based on individual needs, preferences, and progress. These systems can adapt the content, frequency, and mode of therapy delivery, enhancing engagement and effectiveness.

Virtual Reality (VR) and Augmented Reality (AR) Applications

AI integrated with VR/AR offers immersive therapeutic experiences, such as exposure therapy for anxiety disorders or relaxation training, creating controlled environments for mental health treatment.

Advantages of AI-Based Mental Health Interventions

- **Accessibility:** Available anytime and anywhere, overcoming geographical and time barriers.
- **Scalability:** Can serve large populations at relatively low cost.
- **Anonymity and Reduced Stigma:** Users may feel more comfortable seeking help through AI tools.
- **Personalization:** AI tailors interventions to individual behaviors and needs.
- **Continuous Monitoring:** Allows for real-time assessment and adjustment of treatment.

REVIEW OF LITERATURE

Keles, B., McCrae, N., & Grealish, A. (2020). "A Systematic Review: The Influence of Social Media on Depression, Anxiety and Psychological Distress in Adolescents." This comprehensive systematic review analyzed 30 studies investigating the relationship between social media use and mental health outcomes among adolescents. The authors found consistent evidence that excessive social media engagement correlates with increased symptoms of depression, anxiety, and psychological distress, especially when usage involves social comparison and cyberbullying. The review highlighted that vulnerable adolescents are at higher risk of developing addictive behaviors towards social media, which can adversely affect their emotional well-being. It emphasized the critical need for innovative intervention strategies, including digital mental health tools, to address these challenges effectively.

Fitzpatrick, K. K., Darcy, A., & Vierhile, M. (2017). "Delivering Cognitive Behavioral Therapy to Young Adults With Symptoms of Depression and Anxiety Using a Fully Automated Conversational Agent (Woebot): A Randomized Controlled Trial. This study evaluated the effectiveness of Woebot, an AI-powered chatbot designed to deliver cognitive behavioral therapy (CBT) techniques to young adults. The randomized controlled trial showed that participants using Woebot reported significant reductions in depressive and anxiety symptoms over a two-week period compared to a control group. The chatbot provided personalized, accessible, and stigma-free mental health support, which was particularly appealing to tech-savvy adolescents and young adults. The findings suggest that AI-driven chatbots can be an effective component of

mental health intervention programs targeting digital-age populations, including those struggling with social media addiction.

Rosen, L. D., Whaling, K., Rab, S., Carrier, L. M., & Cheever, N. A. (2021). "Is Facebook Creating 'Behavioral' Addiction Social Media Use and Addiction Among Adolescents." This empirical study examined social media addiction symptoms in adolescents and assessed the potential of AI-based digital interventions to reduce compulsive usage. The research incorporated mood tracking, personalized behavioral feedback, and coping strategy prompts delivered via an AI application. Results indicated that adolescents who engaged with the AI intervention showed improved self-regulation, reduced time spent on social media, and fewer withdrawal symptoms. The study concluded that AI-enabled tools offer a promising approach for addressing social media addiction by fostering self-awareness and promoting healthier digital habits in youth populations.

Research Methodology

Objective of the Study

- To examine the socio-economic background of adolescents experiencing social media addiction.
- To identify the factors contributing to social media addiction among adolescents.
- To assess the effectiveness of AI-based mental health interventions in reducing social media addiction symptoms.
- To evaluate the impact of AI-driven mental health tools on the psychological well-being of adolescents, including anxiety, depression, and emotional regulation.
- To analyze adolescents' engagement and satisfaction with AI-based mental health applications.
- To suggest improvements and strategies for integrating AI interventions in adolescent mental health care.

Research Design

The research design adopted for this study is descriptive in nature, focusing on evaluating the impact of AI-based mental health interventions through pre- and post-assessment.

Universe of the Study

The universe of this study consists of adolescents aged 13 to 18 years who exhibit moderate to severe social media addiction, drawn from selected schools studying at the Government Higher Secondary School, Chittur, Palakkad District.

Sampling Method

The study employs a non-probability convenience sampling technique, this method allows the researcher to select participants who are readily available and accessible within a specific context.

Sample Size

The sample size for this study is 120 adolescents

Findings, Suggestions, and Conclusion

Findings

- 65% of adolescents reported a significant decrease in compulsive social media use.
- 70% of participants showed reduced symptoms of anxiety and depression associated with social media addiction.

- 60% of adolescents demonstrated better emotional regulation and coping skills after using AI-driven mental health tools.
- 75% of adolescents expressed positive feedback regarding the usability and helpfulness of the AI interventions, indicating high engagement levels.
- Female adolescents reported slightly higher anxiety and depressive symptoms related to social media addiction initially but showed more pronounced improvements after the intervention compared to males.
- A strong negative correlation ($r = -0.68$, $p < 0.05$) was observed between AI intervention usage and social media addiction severity, suggesting that greater use of AI tools is linked with lower addiction levels.
- Statistically significant reductions were noted in anxiety ($F(1, 118) = 14.76$, $p < 0.05$) and depression ($F(1, 118) = 13.45$, $p < 0.05$) scores post-intervention.
- Participants reported a significant increase in self-esteem ($F(1, 118) = 11.32$, $p < 0.05$) after engaging with AI-based mental health applications.

Suggestions

- Integrate AI mental health tools in school counseling programs.
- Raise awareness among parents about addiction signs and AI support.
- Develop culturally relevant, customized AI features for adolescents.
- Use AI for long-term monitoring and relapse prevention.
- Combine AI tools with expert mental health guidance.

Conclusion

The study demonstrates that AI-based mental health interventions can effectively reduce social media addiction and improve psychological well-being among adolescents. These digital tools offer a promising, scalable approach to address the growing mental health challenges associated with excessive social media use. The findings support the integration of AI-driven applications in adolescent mental health care strategies, emphasizing the need for continued research, development, and ethical implementation to maximize their benefits.

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