

SAFESPEAK: AN ANONYMOUS DIGITAL MENTAL HEALTH COMPANION FOR PAKISTANI TEENS

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Keywords

Safe speak, adolescents, Mental health and Natural Language Processing

Article History

Received: 19 April, 2025

Accepted: 15 May, 2025

Published: 30 June, 2025

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Abstract

Adolescent mental health issues are rising in Pakistan, with over half of youth experiencing anxiety or depression. However, stigma, lack of awareness, and limited access to care often prevent them from seeking help. This study presents SafeSpeak, a culturally adapted, AI-powered anonymous chat platform designed to support Pakistani teenagers facing mental health challenges. Utilizing Natural Language Processing (NLP), the platform enables empathetic conversations, detects emotional distress, and refers serious cases to trained counselors. By ensuring privacy, accessibility, and anonymity, SafeSpeak offers a safe, judgment-free space for self-expression. The paper outlines the platform's design, reviews relevant literature on digital mental health interventions, and proposes an implementation framework. It also examines potential impacts, benefits, and challenges in the context of Pakistan's socio-cultural landscape. SafeSpeak offers a scalable approach to bridging the mental health care gap, especially for underserved and rural youth.

INTRODUCTION

Mental health issues among adolescents have become a global concern, with the situation in Pakistan growing increasingly urgent. Rapid urbanization, academic pressure, social isolation, and lack of structured support systems contribute to rising levels of anxiety and depression among Pakistani youth. Recent studies have revealed that over 50% of adolescents in Pakistan experience symptoms of depression and anxiety, making mental health one of the most pressing yet under-addressed issues in the country [1]. Cultural stigma surrounding mental health poses a significant barrier to open dialogue and access to professional care. Many adolescents fear being judged or misunderstood, which leads to emotional suppression and reluctance to seek help [2]. In many rural and even urban areas, the shortage of trained mental health professionals further limits available options for psychological assistance [3].

Technological advancements offer a unique opportunity to address this gap through digital mental health solutions. AI-powered chatbots and platforms that ensure anonymity and round-the-clock availability have shown promise in providing emotional support to users, particularly youth [4]. In Pakistan's context, a culturally sensitive, secure, and user-friendly platform can serve as a critical first point of contact for struggling adolescents, enabling early intervention and support. This paper proposes SafeSpeak, an AI-based anonymous chat platform tailored to the mental health needs of Pakistani teenagers. The platform seeks to provide accessible and stigma-free emotional support using Natural Language Processing (NLP) and an empathetic response framework. The proposed solution emphasizes ethical handling of user data, seamless escalation to human counselors in high-risk cases, and

cultural adaptation to ensure relevance and effectiveness.

1. Literature Review:

Research indicates that adolescents greatly benefit from accessible and stigma-free mental health support. Online mental health interventions have proven to be effective in reducing emotional distress and improving overall well-being [5]. With increasing smartphone penetration and internet usage among youth, digital platforms offer a promising avenue to bridge the mental health care gap, especially in low-resource countries like Pakistan. AI-based tools have been utilized to detect emotional states, offer supportive dialogues, and even provide early warnings for critical mental health issues. Study demonstrated how AI chatbots can deliver empathetic responses and contribute positively to users' mental health outcomes [4]. These findings support the potential of AI as a low-cost and scalable alternative to traditional therapy.

In Pakistan, mental health concerns among adolescents are notably under-addressed. A study found that over 50% of adolescent's experience symptoms of anxiety and depression, often going unnoticed or untreated due to social stigma and limited access to professionals [1]. This emphasizes the importance of discreet and user-friendly support solutions. Furthermore, Study conducted a content analysis of newspaper reports on adolescent suicides in Pakistan over two years. Their study revealed that many suicides were linked to academic stress, family conflict, and the absence of mental health support structures. These findings highlight a pressing need for timely and anonymous emotional support platforms that can serve as first lines of contact before crises escalate [2]. The collective insights from these studies underscore the need for innovative, tech-enabled interventions like SafeSpeak to address mental health challenges among adolescents in Pakistan.

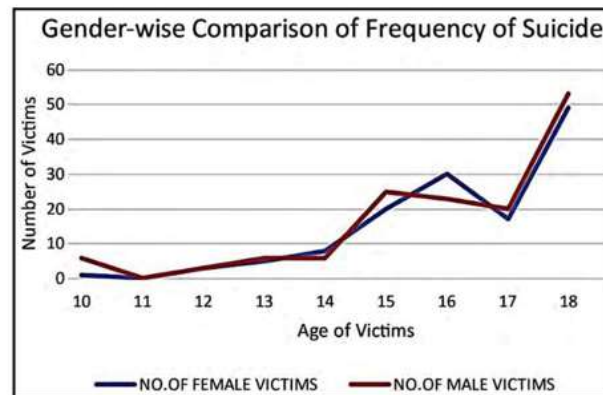


Figure 1: Gender wise comparison of suicide frequency at different ages according to Imran et al. (2021).

2. Proposed Framework:

The development of SafeSpeak involves a multi-stage methodology to ensure the platform is effective, culturally relevant, and secure. The process begins with a needs assessment, including surveys and expert interviews, to understand the psychological and technological requirements of Pakistani adolescents. This helps define the scope and functionality of the platform. The second phase involves designing the AI chatbot, using Natural Language Processing (NLP) to detect emotional cues in user inputs. The chatbot is trained on cultural contextual dialogue to respond empathetically and appropriately. Following this, a

human support integration module is developed to allow escalation of high-risk cases to professional counselors when needed. The next step ensures the implementation of robust security and anonymity measures. All user data is encrypted, and identity protection is prioritized to encourage open communication without fear of exposure. Subsequently, the platform undergoes pilot testing and user feedback collection with a small group of adolescents. Based on the insights gathered, necessary adjustments are made to improve the platform's usability and response accuracy. Finally, the platform proceeds to full deployment and continuous

monitoring, including the evaluation of emotional support outcomes and system performance. Regular

updates and ethical reviews are conducted to maintain effectiveness and safety.

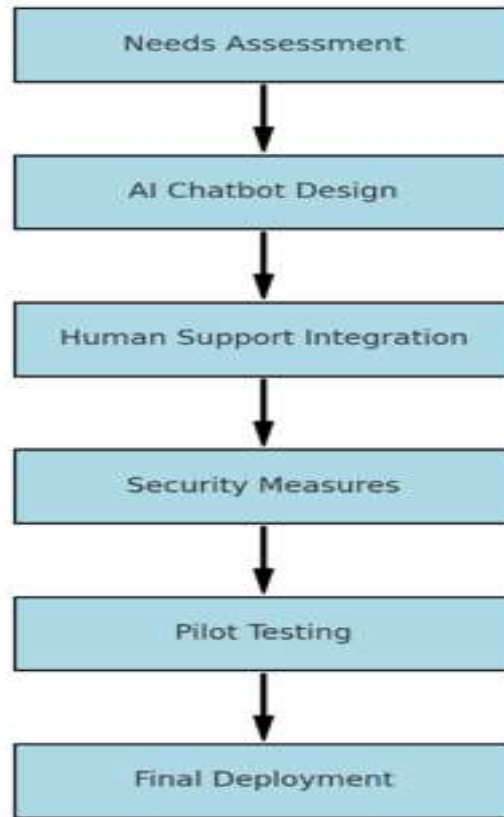


Figure 2: Proposed Framework of Safe Speak

3. Expected Outcomes and Discussion:

The implementation of SafeSpeak is anticipated to yield multiple positive outcomes in the context of adolescent mental health care in Pakistan. The primary expected outcome is an increase in early mental health intervention, as the platform will provide a readily accessible, anonymous space where teenagers can express their emotional struggles without the fear of judgment or exposure. This can potentially reduce the psychological burden among adolescents who otherwise might not seek help due to societal stigma. Another expected outcome is enhanced awareness and engagement around mental health topics. By interacting with the AI-powered chatbot, users are likely to become more conscious of their emotional states, learn basic coping strategies, and be encouraged to consider professional help when needed. This may indirectly lead to a gradual DE stigmatization of mental health issues among youth. The platform also offers the potential for data-driven

insights, allowing researchers and mental health professionals to identify common stressors, emotional trends, and high-risk behavior patterns. With proper ethical oversight and anonymized data collection, such insights can inform broader mental health policies and intervention programs.

However, certain challenges may arise. A key concern is the accuracy of the AI in interpreting nuanced emotional cues in diverse linguistic and cultural contexts. Misinterpretation could lead to inappropriate or unhelpful responses. Regular retraining of the model using localized data and feedback loops will be essential to address this issue. Another challenge lies in ensuring sustained user engagement. Adolescents may lose interest or fail to trust the platform unless it provides consistent, relatable, and supportive interactions. Incorporating gamification elements, periodic content updates, and user feedback integration can help enhance engagement.

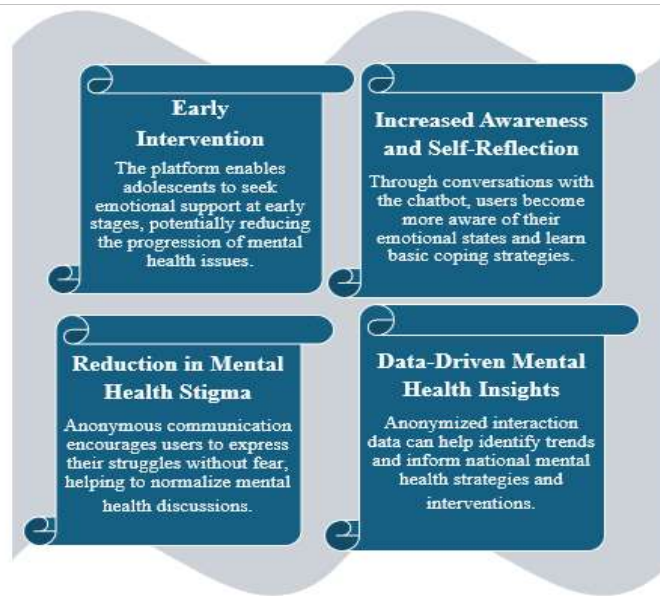


Figure 3: The 4 Outcomes of Proposed Application

4. Conclusion:

The rising prevalence of anxiety, depression, and suicide among adolescents in Pakistan underscores the urgent need for accessible, stigma-free mental health support. Traditional mental health services remain out of reach for many due to cultural barriers, limited resources, and a lack of awareness. SafeSpeak, the proposed AI-powered anonymous chat platform, aims to fill this gap by offering a secure, empathetic, and scalable solution tailored to the needs of Pakistani youth. By combining Natural Language Processing with ethical safeguards and human support integration, SafeSpeak provides a bridge between silent suffering and professional care. It encourages early emotional expression, reduces stigma, and generates valuable insights for policy and intervention. While technical and ethical challenges exist, thoughtful design, cultural adaptation, and ongoing evaluation can ensure its effectiveness. This research advocates for the adoption of AI in mental health care as a proactive and innovative approach to one of Pakistan's most pressing youth issues. With the right support and implementation, SafeSpeak has the potential to positively transform the mental health landscape for the next generation.

REFERENCES:

- Husain, M., Chaudhry, N., Seth, S., et al. (2020). Prevalence and correlates of anxiety and depression among adolescents in Pakistan. *International Journal of Social Psychiatry*.
- Imran, N., Naveed, S., Rafiq, B., Tahir, S. M., Ayub, M., & Haider, I. I. (2021). Pattern of Adolescent Suicides in Pakistan: A content analysis of newspaper reports of two years. *Pakistan Journal of Medical Sciences*.
- Saeed, K., Gater, R., & Hussain, A. (2017). Mental health services in Pakistan: A review of the mental health system. *International Psychiatry*, 14(3), 79-81.
- Inkster, B., Sarda, S., & Subramanian, V. (2018). An empathy-driven, conversational artificial intelligence agent (Wysa) for digital mental well-being: real-world data evaluation. *JMIR mHealth and uHealth*, 6(11), e12106.
- Naslund, J. A., Aschbrenner, K. A., Marsch, L. A., & Bartels, S. J. (2017). The future of mental health care: peer-to-peer support and social media. *Epidemiology and Psychiatric Sciences*, 25(2), 113-122.
- Nasir & Hyder (2018) - Discusses violence and stressors affecting children's mental health in Pakistan.

Rathbone & Prescott (2017) - Systematic review of mobile apps and SMS for mental health interventions.

Gaffney et al. (2019) - Reviews effectiveness of conversational AI agents in mental health care.

Khalid & Qadir (2021) - Explores stigma and help-seeking behaviors among Pakistani university students.

Fitzpatrick et al. (2017) - RCT on "Woebot," an AI chatbot delivering CBT for depression and anxiety.