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MENTAL HEALTH AWARENESS AND AI TOOL ADOPTION AMONG COLLEGE STUDENTS IN AGRA AND DELHI NCR: AN EXPLORATORY CROSS-SECTIONAL SURVEY

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ABSTRACT

Background: Mental health challenges among Indian college students are escalating, yet adoption of digital mental health interventions remains understudied. This exploratory study examined mental health experiences and artificial intelligence (AI) tool adoption patterns among students in diverse urban educational settings.

Methods: A cross-sectional online survey was conducted from January to July 2025 among college students (n=225) in Agra and Delhi NCR using convenience sampling. The structured questionnaire assessed demographics, mental health experiences, help-seeking behaviours, comfort discussing mental health, AI tool awareness/usage, and desired AI features. Data were analyzed using descriptive statistics with 95% confidence intervals.

Results: Stress/anxiety prevalence was 77.1% (95% CI: 71.6%-82.6%), while professional help-seeking remained low at 16.3% (95% CI: 11.4%-21.2%). AI tool awareness was moderate at 28.9% (95% CI: 22.9%-34.9%), but actual usage was minimal at 10.8% (95% CI: 6.7%-14.9%). Students prioritized real-time support (26.9%), data privacy/security (26.4%), emotional intelligence (22.2%), and integration with human

counselling (18.4%) as essential AI features. The sample comprised predominantly females (61.8%), aged 18-22 years (70.7%), pursuing undergraduate studies (75.6%).

Conclusions: Despite high mental health symptom prevalence, students showed limited professional help-seeking and minimal AI tool adoption. The substantial gap between awareness and usage suggests barriers including trust, privacy concerns, and perceived effectiveness. Future AI mental health interventions should prioritize privacy protection, empathetic design, and hybrid human-AI approaches to enhance acceptance among Indian students.

Keywords: mental health, anxiety, college students, India, artificial intelligence, digital health, technology acceptance, cross-sectional study

INTRODUCTION

Mental health challenges among college students in India have reached alarming proportions, with prevalence rates of anxiety and depression ranging from 13-42% across various studies (Kumar & Kroon, 2019; Raj et al., 2022). The unique stressors of Indian higher education—including intense academic competition, family expectations, limited career opportunities, and social stigma surrounding mental health—compound these challenges (Bhandari et al., 2020; Singh et al., 2022). Urban educational hubs like Agra (representing Tier-II cities) and Delhi NCR (metropolitan context) provide critical testing grounds for understanding these dynamics across diverse socioeconomic backgrounds.

The emergence of artificial intelligence (AI)-powered mental health interventions offers promising scalable solutions to address treatment gaps (Fitzpatrick et al., 2017; Sarda et al., 2022). However, technology adoption in mental health contexts is complex, mediated by factors including perceived usefulness, trust, privacy concerns, and cultural appropriateness (Torous et al., 2020; Arya & Mishra, 2023). The Technology Acceptance Model (TAM) suggests that perceived usefulness and ease of use drive technology adoption, while the Health Belief Model (HBM) emphasizes perceived barriers, benefits, and cues to action in health-related behaviors (Venkatesh et al., 2003; Champion & Skinner, 2008).

Despite growing interest in digital mental health solutions globally, limited research exists on AI tool adoption patterns among Indian college students. Previous studies have focused primarily on Western

populations or general digital health acceptance, leaving gaps in understanding cultural, technological, and contextual factors specific to Indian educational settings (Denecke et al., 2021; Inkster et al., 2018).

This exploratory study addresses these gaps by examining:

1. Prevalence of mental health concerns among students in Agra and Delhi NCR,
2. Patterns of professional help-seeking and comfort discussing mental health,
3. Awareness and usage of AI-based mental health tools, and
4. Preferred features for AI mental health interventions. The findings provide foundational insights for developing culturally appropriate digital mental health solutions for Indian college populations.

METHODS

Study Design and Setting

An exploratory cross-sectional survey was conducted from January to July 2025 targeting college and university students in Agra (Uttar Pradesh) and Delhi National Capital Region (NCR). These locations were selected to represent diverse educational contexts: Agra as a Tier-II city with established universities, and Delhi NCR as a major metropolitan educational hub.

Participants and Sampling

Inclusion criteria: (1) Current enrolment in undergraduate or postgraduate programs,

(2) Age 18-29 years, (3) Studying in Agra or Delhi NCR institutions.

Exclusion criteria: (1) Incomplete survey responses, (2) Age outside specified range. Convenience sampling was employed through institutional networks, student WhatsApp groups, and social media platforms. While this approach facilitated access amid practical constraints, it may over-represent digitally literate and health-engaged students, limiting generalizability to the broader student population.

Sample Size Justification

Based on estimated college student population of 500,000 in the study regions, our achieved sample of 225 participants provides a margin of error of ±6.5% at 95% confidence level— acceptable for exploratory research (Cochran, 1977). While below the ideal 384 responses needed for ±5% precision, this sample size is adequate for descriptive analysis and hypothesis generation in an understudied population.

Data Collection Instrument

A structured questionnaire was developed based on established instruments and literature review, comprising four sections:

Demographics: Age, gender, academic background

Mental Health Experiences: Self-reported stress/anxiety, professional help-seeking, comfort discussing mental health (10-point Likert scale)

AI Tool Awareness/Usage: Familiarity with AI mental health apps (e.g., Woebot, Wysa, Calm), usage patterns, effectiveness ratings

AI Preferences: Perceived personalization capability, desired features (privacy/security, empathy, real-time support, human integration)

The survey was administered via Google Forms in English, with Hindi support for specific terms. Pilot testing (n=15) ensured clarity and cultural appropriateness.

Statistical Analysis

Descriptive statistics were calculated for all variables, with proportions reported with 95% confidence intervals. Demographic comparisons used chi-square tests where appropriate. All analyses were conducted using Python pandas and statistical libraries. Missing data were handled through listwise deletion for specific analyses.

Ethical Considerations

The study received institutional approval and followed ethical guidelines for survey research. Electronic informed consent was obtained from all participants. Data were anonymized and stored securely. Participation was voluntary with no incentives provided.

Limitations

Several limitations should be acknowledged: (1) Convenience sampling limits representativeness,

(2) Online-only distribution may exclude less digitally connected students, (3) Self-reported data may introduce social desirability bias, (4) Cross-sectional design precludes causal inferences, (5) Temporal

clustering of responses (66% in January 2025) may introduce seasonal bias, (6) Small subgroup sizes limit detailed demographic analyses.

RESULTS

Sample Characteristics

A total of 225 students participated, with demographics shown in Table 1. The majority were female (61.8%), aged 18-22 years (70.7%), and pursuing undergraduate studies (75.6%). This distribution aligns with typical Indian higher education demographics and reflects higher female participation rates in health-related surveys.

Table 1: Participant Demographics (N=225)

Characteristic	N	%
Gender		
Female	139	61.8
Male	84	37.3
Non-binary/Prefer not to say	1	0.4
Age Groups		
Below 18	36	16.0
18-22	159	70.7
23-25	19	8.4
Characteristic	N	%
26-29	10	4.4
Academic Level		
Undergraduate	170	75.6
Postgraduate	38	16.9
Other	14	6.2

MENTAL HEALTH EXPERIENCES

Prevalence of Stress and Anxiety

Of 223 respondents answering the mental health question, 172 (77.1%, 95% CI: 71.6%-82.6%) reported experiencing stress, anxiety, or other mental health concerns during their studies. This high prevalence was consistent across demographic groups, with undergraduate students showing slightly higher rates (78.8%) compared to postgraduates (73.7%).

Professional Help-Seeking Behavior

Despite high symptom prevalence, only 36 of 221 respondents (16.3%, 95% CI: 11.4%-21.2%) had sought professional help for mental health concerns. This low rate reflects documented barriers including stigma, cost, availability, and cultural factors in the Indian context.

Comfort Discussing Mental Health

Participants reported moderate comfort levels discussing mental health issues, with substantial variability indicating differing levels of help-seeking readiness across the sample.

AI TOOL AWARENESS AND ADOPTION

Awareness of AI Mental Health Tools

Among 218 valid responses, 63 participants (28.9%, 95% CI: 22.9%-34.9%) were aware of AI- based mental health tools such as Woebot, Wysa, or Calm. Awareness rates were similar across

gender lines but varied by academic level, with postgraduates showing slightly higher awareness (31.6%) than undergraduates (27.6%).

Actual Usage of AI Tools

Only 24 of 222 respondents (10.8%, 95% CI: 6.7%-14.9%) had actually used AI-powered mental health tools, revealing a substantial awareness-usage gap. Among users, reported tools included ChatGPT, mental health and mood trackers, and WhatsApp AI assistants, suggesting broader interpretation of "AI mental health tools" beyond specialized applications.

Perceived Effectiveness

Among the limited number of users who provided effectiveness ratings, scores ranged widely from 1-10, with high variability suggesting mixed experiences. The small user base (n=24) limits robust effectiveness conclusions.

AI Tool Feature Preferences

Students expressed clear preferences for AI tool features, prioritizing practical functionality and

human-like qualities:

Table 2: Desired AI Mental Health Tool Features (N=225)

Feature	N	%
Real-time support	57	26.9
Data privacy and security	56	26.4
Emotional intelligence and empathy	47	22.2
Integration with existing counseling services	39	18.4
Other features	26	12.3

These preferences align with documented concerns about digital health privacy in India and the cultural importance of empathetic, human-centered care approaches.

Beliefs About AI Personalization

Regarding AI's capability to provide personalized mental health support, responses were mixed: 25.3% strongly agreed/agreed, 34.2% were neutral, and 40.4% disagreed/strongly disagreed. This skepticism may reflect limited exposure to AI capabilities or concerns about algorithmic understanding of individual needs.

DISCUSSION

Principal Findings

This exploratory study reveals several key insights into mental health and AI tool adoption among college students in Agra and Delhi NCR. First, the 77.1% prevalence of self-reported stress and anxiety aligns with recent systematic reviews documenting high mental health symptom rates among Indian students (Kumar & Kroon, 2019; Raj et al., 2022). This consistency across diverse urban contexts suggests widespread challenges requiring systematic intervention.

Second, the stark disparity between symptom prevalence (77.1%) and professional help-seeking (16.3%) underscores persistent barriers in Indian mental health care access. These barriers— including stigma, cost, availability, and cultural factors—are well-documented but remain inadequately addressed (Singh et al., 2022; Gururaj et al., 2016).

Third, the substantial gap between AI tool awareness (28.9%) and usage (10.8%) suggests that knowledge alone is insufficient for adoption. This finding aligns with Technology Acceptance Model predictions, where perceived usefulness, ease of use, and trust mediate technology adoption (Venkatesh et al., 2003). The low adoption may reflect concerns about effectiveness, privacy, or cultural appropriateness of existing AI tools.

Feature Preferences and Design Implications

Students' strong preferences for real-time support (26.9%) and data privacy/security (26.4%) reflect both the immediacy of mental health needs and heightened awareness of digital privacy risks in India's evolving data protection landscape (Arya & Mishra, 2023). The emphasis on emotional intelligence and empathy (22.2%) suggests current AI tools may feel overly mechanical or impersonal, consistent with qualitative feedback from several participants noting AI's "robotic vibes."

The preference for integration with human counseling services (18.4%) supports hybrid care models rather than AI-only approaches. This finding aligns with recommendations for complementary rather than replacement models of AI in mental health care (Torous et al., 2020).

Theoretical Framework Application

Through the lens of the Health Belief Model, our findings suggest that while students perceive high susceptibility to mental health issues (77.1% prevalence) and severity, perceived barriers to both traditional and AI-based interventions remain high. The low professional help-seeking and minimal AI adoption indicate that current interventions fail to address key barriers or provide sufficient cues to action.

The Technology Acceptance Model framework helps explain the awareness-usage gap: despite moderate perceived usefulness (awareness), concerns about ease of use, trust, and effectiveness may inhibit adoption. The privacy preferences suggest that perceived risk is a crucial factor not fully captured in traditional TAM models.

Cultural and Contextual Considerations

The moderate comfort levels discussing mental health suggest gradual attitude shifts among urban educated youth, though substantial variation persists. This finding has implications for AI tool design, suggesting need for culturally sensitive approaches that respect varying comfort levels and communication preferences.

The geographic diversity (Agra and Delhi NCR) provides insights across urban contexts, though our convenience sampling may over-represent more progressive, digitally literate students. Future research should explore rural-urban differences and socioeconomic variations in AI acceptance.

Comparison with International Literature

Our AI adoption rates (10.8%) are lower than reported in some Western studies, which may reflect cultural differences, AI tool availability, language barriers, or trust factors. However, the feature preferences (privacy, empathy, human integration) show remarkable consistency with international findings, suggesting universal design principles despite cultural variations (Fitzpatrick et al., 2017; Inkster et al., 2018).

Implications for Practice and Policy

THESE FINDINGS HAVE SEVERAL PRACTICAL IMPLICATIONS:

AI Tool Development: Developers should prioritize privacy-by-design approaches, empathetic conversational interfaces, and clear integration pathways with human mental health professionals.

Campus Mental Health Services: The high symptom prevalence but low help-seeking suggests need for proactive outreach, stigma reduction campaigns, and accessible service delivery models.

Digital Health Policy: The low AI adoption despite moderate awareness indicates need for evidence-based implementation strategies, user education, and regulatory frameworks ensuring quality and safety.

LIMITATIONS AND FUTURE RESEARCH

This exploratory study has several limitations that should guide interpretation and future research. The convenience sampling approach limits generalizability, particularly to less digitally connected or more socioeconomically diverse populations. The online-only distribution may have excluded students with limited internet access or digital literacy. The temporal clustering of responses, with 66% collected in January 2025, may introduce seasonal bias in mental health reporting.

Future research should employ probability sampling methods, include offline data collection approaches, and explore longitudinal patterns of AI tool adoption. Qualitative studies could

provide deeper insights into barriers and facilitators of AI adoption, while randomized controlled trials could evaluate effectiveness of culturally adapted AI interventions.

CONCLUSIONS

This exploratory study provides foundational insights into mental health experiences and AI tool adoption patterns among college students in diverse Indian urban contexts. The high prevalence of mental

health symptoms (77.1%) combined with low professional help-seeking (16.3%) and minimal AI tool adoption (10.8%) highlights substantial unmet needs and intervention opportunities.

The pronounced gap between AI tool awareness (28.9%) and usage (10.8%) suggests that simply increasing knowledge is insufficient—addressing trust, privacy, effectiveness, and cultural appropriateness concerns is crucial for successful implementation. Students' clear preferences for real-time support, privacy protection, empathetic design, and human-AI integration provide actionable guidance for developers and implementers.

While these findings should be interpreted cautiously given sampling limitations, they contribute valuable preliminary evidence to the limited literature on AI mental health tool adoption in Indian educational contexts. The results support the need for culturally sensitive, privacy-focused, and hybrid AI-human approaches to digital mental health intervention in this population.

Future research should build on these exploratory findings through more representative sampling, longitudinal designs, and intervention studies to advance evidence-based digital mental health solutions for Indian college students.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Anonymized data supporting the conclusions of this article are available from the corresponding author upon reasonable request.

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