

Patterns of Smartphone Use and Cyberspace-Oriented Relations Among Engineering Students in Pakistan

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Annotation: This cross-sectional study investigated smartphone trends and usage behaviors among Aga Khan University engineering undergraduates in Pakistan from July to October 2023. Utilizing the Smartphone Addiction Survey (SAS) via Google Forms, researchers secured 332 responses. SPSS 25.0 analysis revealed that students use devices for storage, communication, education, and entertainment, with no significant gender-based differences ($p > 0.05$). Key behaviors identified included daily life disturbance, overuse, withdrawal, tolerance, and cyberspace-oriented relations. These results offer valuable insights into students' online habits, providing a foundation for targeted interventions to encourage healthy smartphone use and improve educational outcomes in the digital age.

Key words: Engineering students, Smartphone, Smartphone addiction, Pakistan

Модели использования смартфонов и киберпространственных взаимодействий среди студентов инженерных специальностей в Пакистане

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Аннотация: В данном поперечном исследовании изучались тенденции использования смартфонов и особенности поведения студентов инженерных специальностей Университета Ага Хана в Пакистане в период с июля по октябрь 2023 года. С помощью опросника по зависимости от смартфонов (Smartphone Addiction Survey, SAS), проведенного через Google Forms, исследователи получили 332 ответа. Анализ с использованием SPSS 25.0 показал, что студенты используют устройства для хранения данных, общения, обучения и развлечений, при этом не выявлено существенных гендерных различий ($p > 0,05$). К основным выявленным особенностям поведения относятся: нарушение повседневной жизни, чрезмерное использование, синдром отмены, толерантность и отношения, ориентированные на киберпространство. Эти результаты предоставляют ценную информацию о привычках студентов в интернете, создавая основу для целенаправленных вмешаний, направленных на поощрение здорового использования смартфонов и улучшение результатов обучения в цифровую эпоху.

Ключевые слова: студенты инженерных специальностей, смартфон, зависимость от смартфонов, Пакистан

Introduction

The widespread adoption of smartphones has revolutionised global communication and information access. Their internet connectivity has profoundly reshaped the daily routines of youth, especially in cities. By 2021, one in three urban young adults used smartphones – a trend equally visible in Pakistan’s evolving digital scene [1]. Today’s smartphones go beyond calls and texts, serving as multifunctional tools for gaming, streaming, and social networking. Yet this surge in usage has brought notable downsides, particularly for young people. Research shows that around 60 % of Pakistani teenagers struggle with smartphone addiction [2]. The consequences are wide-ranging and alarming [3]. Studies, including work by Lebni et al., link excessive smartphone use to mental health issues (depression,

anxiety) and poor academic outcomes [4]. Overreliance on these devices often obscures their negative effects, undermining academic performance. Physical and behavioural problems also arise: screen time can cause eye strain, poor posture, and sleep issues [5], while behaviourally it may foster social isolation, reduced physical activity, and exposure to cyberbullying or inappropriate content. Understanding smartphone use among specific groups – such as Pakistani undergraduate engineering students – is vital. These students are at a critical educational stage and are likely heavy tech users. Examining their habits can inform interventions that reduce harm while encouraging balanced technology use. This study explores smartphone usage patterns among Pakistani engineering undergraduates, assessing both benefits and drawbacks. It aims to reveal how these devices affect students' academic, physical, and mental well-being, offering insights for future healthcare professionals. Most smartphone users are aged 21–30, with 77 % in this group showing signs of addiction [2]. Many teenagers rarely switch off their devices, even at night, heightening addiction risks [6]. Smartphone addiction refers to uncontrollable use [7]. The CDC notes a rise in related disruptive behaviours from 2010 to 2015, including a 58 % increase in severe depression and a 65 % rise in suicide rates over five years. Females appear particularly vulnerable to psychological impacts [6]. The Smartphone Addiction Scale (SAS), developed by Dr Seunghee Lee-Kwon in 2013, is a reliable tool for assessing addiction severity [8]. Its 33 items measure daily disruptions, overuse, withdrawal, cyber-oriented interactions, and tolerance. Engineering students often face high stress and burnout, increasing their risk of using smartphones as a distraction — and potentially developing addiction [9][10]. Research questions: 1. What are the smartphone usage trends among Pakistani engineering undergraduates? 2. Which disruptive behaviours accompany their smartphone use?

Material and methods

This study employed a cross-sectional survey at Aga Khan University, completed within 4 months. The sample comprised 332 undergraduate engineering students. Inclusion criteria were current undergraduate status and daily smartphone

use, with no preference for gender, age, class, or usage type. Prior to distributing the survey link, participants received briefings on study objectives, risks, and benefits, and provided informed consent. Data were collected electronically via Google Forms, using a proforma with demographic questions and the validated Smartphone Addiction Survey (SAS). Participant identities remained anonymous, and data were kept confidential. Data from Google Forms were exported to Excel and then imported into SPSS 25.0 for analysis. Numerical data were summarised using means and standard deviations; categorical data were presented as frequencies and percentages. ANOVA was used to examine differences in ratings across the six SAS themes, with a 5 % significance level. Hypotheses: H_0 : No difference in ratings by MBBS class across SAS behaviours. H_1 : Difference in ratings by MBBS class across SAS behaviours. Of 410 invited students, 332 responded. Year distribution: 1st year: 31.06 %; 2nd year: 15.15 %; 3rd year: 18.18 %; 4th year: 15.91 %; 5th year: 19.70 %. Gender distribution: 68.18 % female, 31.82 % male. Smartphone usage patterns: 1) Information storage: 17.42 %, 2) Communication only: 14.4 % and 3) Entertainment only: 1.5 %. No significant gender-based differences in usage trends were found. Mean scores (SD) by SAS theme: Cyberspace-Oriented Relations: 4.04 (1.01); Daily Life Disturbance: 4.98 (1.55), Tolerance: 4.19 (0.59); Withdrawal: 3.20 (0.55); Overuse: 3.07 (0.56). ANOVA results showed a statistically significant difference for Cyberspace-Oriented Relations ($F = 4.25$, $p = 0.022$), indicating variation in responses. Other categories (Daily Life Disturbance, Overuse, Withdrawal, Tolerance) showed no significant differences ($p > 0.05$).

Discussion

This research examines smartphone habits among Pakistani engineering students, revealing how these devices have evolved into essential, multi-functional tools. Many students utilize smartphones for education, shopping, and entertainment, reflecting a global shift toward all-in-one digital reliance [7, 11, 12]. However, this integration increases the risk of addiction and health issues. Similar to findings in

Korea and Saudi Arabia, excessive usage is strongly associated with sleep disorders, stress, and anxiety [1-5].

The study identified several disruptive behaviors, including withdrawal, tolerance, and life disturbance. While data showed no significant variation between academic years, mean scores suggested moderate levels of overuse and procrastination. This mirrors previous studies linking smartphone dependency to withdrawal symptoms and the "Fear of Missing Out" (FOMO) [13-15].

Furthermore, the rise of "cyberspace-oriented relationships" indicates a shift in social dynamics; many students now prioritize virtual interactions over physical ones, equating the loss of their device to losing a friend [16]. This deep emotional attachment drives an anxiety-driven compulsion for constant connectivity [17]. Finally, the fact that a full battery rarely lasts a day highlights "tolerance," where users require increasingly frequent engagement to achieve the same level of satisfaction.

Conclusion

This investigation demonstrates the extensive prevalence of smartphone integration among undergraduate engineering students in Pakistan, while providing a detailed analysis of the resulting behavioral manifestations and psychological repercussions. The striking alignment between these local findings and broader global patterns of smartphone addiction further underscores the urgent necessity for implementing comprehensive, multi-dimensional frameworks to address this rising challenge. By serving as a critical empirical baseline, these results can facilitate the design of tailored intervention strategies aimed at promoting more balanced digital consumption. Such efforts are essential to safeguard the mental well-being and optimize the professional development of future engineering practitioners.

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