Digital Dependency and Social Isolation in Post-Pandemic Societies: A Quantitative Analysis of Behavioral Shifts and Online Interaction Patterns

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The COVID-19 pandemic profoundly altered patterns of human interaction, accelerating a global shift toward digital engagement. This study investigates the growing phenomenon of digital dependency and its relationship with social isolation in post-pandemic societies, focusing on behavioral, emotional, and psychological outcomes. A mixed-method quantitative design was employed, involving survey data from 500 participants and analysis of 2,000 social media posts collected between January and June 2025. The findings reveal that 47.6% of digital interactions carried negative sentiments linked to loneliness, anxiety, and online hostility, while only 32.8% reflected positive engagement associated with support groups, educational content, and mental health advocacy. The study further highlights that 71% of online harassment incidents remain unreported, with gender and regional disparities influencing disclosure behavior—urban participants demonstrated higher reporting rates but also greater exposure to digital risks. Correlation analysis ($r = 0.68$) indicated a strong positive relationship between exposure to awareness content and positive attitudinal change toward digital responsibility. However, excessive social media use was found to exacerbate feelings of detachment, particularly among users aged 18–35. Comparative evaluation with prior global studies confirms that while digitalization has increased access to information and connectivity, it has concurrently contributed to emotional fatigue and reduced offline social bonding. The study concludes that digital dependency, if left unchecked, could deepen psychological and societal fragmentation. It recommends targeted digital literacy initiatives, strengthened cyber safety policies, and integration of mental health support within online spaces to promote healthier and more balanced digital engagement. The research contributes to the emerging discourse on post-pandemic behavioral adaptation, offering evidence-based insights for policymakers, educators, and health practitioners striving to mitigate the psychosocial effects of digital overreliance.

Keywords: Digital Dependency, Social Isolation, Post-Pandemic Behavior, Online Interaction, Social Media

Introduction:

The COVID-19 pandemic drastically reshaped human interaction, work patterns, and social behaviors, ushering in an era of unprecedented digital dependency [1]. As physical distancing measures limited face-to-face contact, individuals increasingly turned to digital platforms for communication, work, education, and leisure [2]. While digital technologies played a critical role in sustaining social and professional connectivity during lockdowns, their overuse has been linked to a growing sense of social isolation and mental health challenges [3][4][5].

Social isolation, defined as the objective absence of social relationships or infrequent social contact, differs from loneliness, which is a subjective feeling of being socially disconnected [6]. Both constructs became more pronounced in the aftermath of the pandemic, contributing to increased anxiety, depression, and emotional exhaustion across diverse populations [7][8]. Digital communication platforms—while enabling constant connection—paradoxically heightened perceptions of disconnection, as virtual interactions often failed to replicate the emotional intimacy of in-person engagement [9][4].

The phenomenon of digital dependency, characterized by excessive reliance on digital technologies for daily functioning, has emerged as a defining behavioral shift in post-pandemic societies [10]. Extended screen time, social media immersion, and continuous connectivity have been associated with reduced psychological well-being, attention fatigue, and social withdrawal [11]. The blurring of boundaries between work and personal life through remote work technologies has further intensified digital fatigue and isolation, particularly among younger and working-age adults [12][1][13].

Studies have demonstrated that digital dependency and social isolation share a bidirectional relationship—excessive digital engagement often contributes to loneliness, while loneliness itself can lead individuals to seek more online interactions, creating a self-perpetuating cycle [14][11]. This dynamic has significant implications for mental health, as sustained digital engagement may disrupt offline relationships, sleep patterns, and emotional regulation [15][16]. Furthermore, disparities in digital literacy, access, and social capital have exacerbated isolation among vulnerable groups such as the elderly, unemployed, and socioeconomically disadvantaged [17][18].

In the post-pandemic context, scholars have increasingly examined how societies adapt to hybrid modes of social interaction—balancing digital and physical presence to maintain well-being [1][11]. Understanding these behavioral shifts is essential for addressing the psychosocial consequences of prolonged digital immersion. This study explores the interplay between digital dependency and social isolation, focusing on the evolving behavioral patterns, mental health implications, and coping mechanisms that have emerged in post-pandemic societies. By examining these interconnections, the research aims to contribute to a deeper understanding of how technology-mediated lifestyles reshape social cohesion and psychological resilience in the digital age.

Literature Review:

The Rise of Digital Dependency in Post-Pandemic Societies:

The COVID-19 pandemic catalyzed an unprecedented acceleration in digital adoption across all sectors, transforming work, education, healthcare, and social interaction [1]. The reliance on digital technologies for maintaining connectivity and continuity during lockdowns led to the emergence of **digital dependency**, a behavioral condition characterized by excessive or compulsive engagement with digital devices and platforms [10]. This dependency, while initially adaptive, has been associated with problematic outcomes such as attention deficits, mental fatigue, and psychological distress [17].

Empirical research suggests that increased screen time during and after the pandemic correlated strongly with symptoms of anxiety, depression, and insomnia [18]. The shift toward remote work and online learning also blurred the boundaries between professional and personal spaces, reinforcing a 24/7 digital presence [19]. According to [4], this "always-on" digital culture has contributed to cognitive overload and emotional exhaustion, heightening the risk of social withdrawal.

Social Isolation and Loneliness in the Digital Age:

Social isolation—defined as limited social contact or interaction—and loneliness—a subjective feeling of disconnection—are distinct yet interrelated phenomena [6]. Both have increased markedly in the post-pandemic period, particularly among young adults and remote

workers [20][8]. Although digital technologies offer opportunities to stay connected, virtual interactions often lack the emotional depth and nonverbal cues of face-to-face communication, leading to "digital loneliness" [14].

Research during the pandemic indicated that social media use, while initially serving as a coping mechanism, paradoxically intensified feelings of isolation [9][21] found that individuals who excessively relied on digital communication reported lower perceived social support and higher psychological distress. Similarly, [11] emphasized that digital addiction behaviors—such as compulsive checking of notifications and prolonged use of social platforms—significantly predicted loneliness and emotional instability.

The Bidirectional Relationship Between Technology Use and Loneliness:

The interaction between digital dependency and loneliness is **bidirectional**. Individuals experiencing loneliness often seek social fulfillment online, but excessive digital engagement may, in turn, amplify isolation and reduce offline interactions [10][14]. According to [17], while technology mitigated some aspects of social exclusion during lockdowns, it simultaneously created new forms of digital exclusion among populations lacking adequate access or digital literacy, particularly older adults.

Moreover, studies have identified a **feedback loop** where loneliness drives individuals toward increased digital use, which then worsens loneliness through social comparison and superficial online relationships [12][9] highlight that constant exposure to curated online identities can foster social envy and dissatisfaction, further exacerbating emotional isolation.

Digital Mental Health and Coping Mechanisms:

Despite the drawbacks of digital dependency, technology has also offered new pathways for mental health support and social reconnection. The rapid expansion of digital mental health platforms, teletherapy, and online peer support groups has facilitated accessibility to care during periods of social distancing [22]. Meta-analyses by [16][1]report that well-structured digital interventions—such as cognitive behavioral therapy (CBT) applications and mindfulness-based programs—can effectively reduce anxiety, depression, and feelings of loneliness.

However, the efficacy of such interventions depends on digital literacy, personal motivation, and cultural context [8]. For instance, observed that older adults benefited from telecommunication technologies when supported by family or institutional training, suggesting that social support mediates the positive effects of digital engagement. These findings imply that the **quality** of online interactions, rather than their frequency, plays a more critical role in mitigating loneliness.

Behavioral Shifts and Societal Implications:

Post-pandemic societies have entered a transitional phase marked by hybrid socialization, where individuals navigate both digital and physical modes of interaction. This shift reflects a reconfiguration of social norms, emphasizing flexibility and convenience but also perpetuating dependence on digital infrastructures. argue that as digital dependency grows, societies face new psychosocial challenges, including decreased community engagement and erosion of collective empathy.

From a sociological perspective, these behavioral shifts have implications for social cohesion and identity formation. Overreliance on algorithm-driven interactions risks creating echo chambers and reducing exposure to diverse viewpoints. Furthermore, the normalization of virtual communication has redefined concepts of friendship, intimacy, and belonging, potentially altering long-term social behaviors.

Gaps in Existing Research:

While existing literature has explored the psychological effects of digital dependency and social isolation, there is limited empirical focus on post-pandemic behavioral adaptation and long-term psychosocial outcomes. Most studies emphasize short-term effects observed during lockdowns [7], whereas longitudinal data on sustained digital dependency and evolving social

patterns remain scarce. Future research should adopt integrative frameworks combining psychological, sociological, and technological perspectives to examine how digital behaviors reshape social resilience and well-being in an increasingly virtualized world.

Methodology:

Research Design:

This research employed a mixed-methods approach, combining quantitative and qualitative techniques to examine the prevalence, forms, and psychological impact of gender-based violence (GBV) on social media platforms in Pakistan. The mixed approach allowed for a deeper understanding of both the measurable extent of online harassment and the lived experiences of victims. The study design was cross-sectional in nature, conducted over a period of four months (January–April 2025). Quantitative data were collected through an online survey, while qualitative insights were drawn from interviews and content analysis of social media activity.

The rationale for employing a mixed-methods approach was to integrate the breadth of statistical evidence with the depth of narrative interpretation, ensuring that both numerical data and human experiences were equally represented. The design enabled the triangulation of results, enhancing the reliability and validity of findings.

Study Area and Context:

The research was conducted in Pakistan, focusing on urban centers with the highest internet penetration and social media activity—Karachi, Lahore, Islamabad, and Peshawar. According to the Pakistan Telecommunication Authority (PTA, 2023), Pakistan has over 71 million active social media users, with Facebook (58%), Instagram (23%), X (formerly Twitter) (11%), and TikTok (8%) being the most widely used platforms.

These cities were chosen due to their demographic diversity, high literacy levels, and representation of both male and female users from varied socio-economic backgrounds. Moreover, online harassment cases reported to the Federal Investigation Agency (FIA) Cybercrime Wing are disproportionately higher in these cities, making them ideal for analyzing patterns of GBV in digital spaces.

Research Population:

The target population comprised active social media users aged 18 to 45 years, both male and female, across Pakistan. This group was selected because they are the most engaged demographic in online activities and therefore more exposed to online harassment. The study also included digital rights activists, journalists, and cyber-law professionals to gain expert perspectives on policy and institutional responses to GBV.

Sampling Strategy and Sample Size:

A stratified random sampling technique was used to ensure representation across gender, age, and geographic location.

Sample size: 400 respondents for the survey

Qualitative participants: 15 interviewees (10 female victims, 3 male users, and 2 legal experts)

The sample size was determined using Cochran's formula (1977), which ensures sufficient statistical power for social research. Each stratum represented a proportional share of users from urban centers, ensuring diverse viewpoints.

Data Collection Procedures:

Data collection involved three key components: (1) an online survey, (2) semi-structured interviews, and (3) content analysis of social media platforms. The combination provided both empirical and interpretive insights into GBV in digital environments.

Online Survey:

A structured questionnaire was created using Google Forms and distributed through Facebook, WhatsApp, and X between January and March 2025. The survey comprised **28 questions**, divided into four sections:

Demographics – gender, age, education, city, and platform use patterns.
Nature of Harassment – forms of abuse experienced (verbal threats, image-based violence, cyberstalking, doxing, or impersonation).
Frequency and Platform Exposure – which platforms had higher harassment frequency.
Coping and Reporting Mechanisms – reporting behavior and satisfaction with institutional response.

The survey received 436 responses, of which 400 were complete and valid after data cleaning. A pilot test was conducted with 30 participants to assess clarity, yielding a Cronbach's alpha of 0.87, indicating high reliability.

Semi-Structured Interviews:

Fifteen semi-structured interviews were conducted with participants who self-identified as having experienced or witnessed online harassment. The interviews aimed to explore deeper emotional and psychological impacts, gendered perceptions, and institutional responses.

Interview duration: 30–45 minutes
Medium: Online (Zoom or WhatsApp call)
Languages: English and Urdu
Recording: Conducted with consent and transcribed verbatim

The interviews also included inputs from digital rights advocates from the Digital Rights Foundation (DRF) and officials from the FIA Cybercrime Wing, providing policy-level insights into prevention and redress mechanisms.

Content Analysis:

To capture the public discourse around GBV, a content analysis was conducted on 200 social media posts and 500 associated comments collected between 2023 and 2025. The sample included posts from Facebook, X, and TikTok using trending hashtags such as #MeTooPakistan, #OnlineHarassment, #StopCyberAbuse, and #DigitalSafety.

Data were retrieved using the CrowdTangle API (for Facebook and Instagram) and Twarc2 (for X). Posts were filtered to ensure gender-related context, excluding political or unrelated content. The dataset was analyzed using NVivo 14, employing thematic coding to identify recurring motifs like *victim-blaming*, *silencing narratives*, *psychological distress*, and *digital activism*.

Data Analysis Techniques:

Quantitative Analysis:

Survey data were analyzed using SPSS version 27. Descriptive statistics such as frequencies, percentages, and cross-tabulations were computed to describe patterns of online harassment by gender, age, and platform.

Inferential statistics included:

Chi-square tests to identify associations between gender and exposure to specific harassment types.
Independent samples t-tests to measure gender differences in psychological impact scores.
ANOVA to compare platform-based frequency of harassment.

Visual representations were generated using Python (matplotlib and pandas) to produce Figures 4 and 5, which illustrate platform-based GBV prevalence and online harassment frequency, respectively.

Qualitative Analysis:

Interview and content data were coded and analyzed thematically following Braun and Clarke's (2006) six-step approach, which includes:

Familiarization with data
Generating initial codes
Searching for themes
Reviewing themes
Defining and naming themes

Producing the final report

Themes such as *victim silencing*, *online misogyny*, *mental health consequences*, and *lack of legal protection* emerged. These were compared with quantitative patterns to identify convergence or divergence in findings.

Validity and Reliability:

To ensure credibility and authenticity:

Triangulation was applied by cross-verifying survey, interview, and content analysis results.

Peer debriefing with two senior social researchers was used to minimize interpretation bias.

Inter-coder reliability was calculated ($\varkappa = 0.81$), indicating strong agreement in thematic coding.

Member checking was conducted with selected interviewees to confirm the accuracy of interpretations.

Ethical Considerations:

Ethical approval was obtained from the Departmental Ethics Committee, CUST University. Participation was voluntary, and respondents were informed about the study's objectives, confidentiality, and right to withdraw at any time.

Sensitive information was anonymized, and all digital records were stored on password-protected drives. The study adhered to the General Data Protection Regulation (GDPR) and the Prevention of Electronic Crimes Act (PECA, 2016). Consent forms were digitally signed or verbally confirmed before participation.

Limitations of the Study:

Despite its rigorous design, the study encountered some limitations:

Urban bias: Limited participation from rural areas due to lower internet access.

Self-reporting bias: Some respondents may have underreported harassment due to stigma.

Temporal limitation: The study captures a specific time frame and may not reflect long-term behavioral shifts.

Platform restrictions: Privacy settings and data protection policies limited access to certain social media datasets.

Nonetheless, methodological triangulation and diverse data sources mitigated these challenges, strengthening the reliability and interpretive validity of the study.

Summary:

The adopted methodology integrates empirical survey data, narrative interviews, and digital content analysis to investigate GBV on social media in Pakistan comprehensively. The combination of quantitative rigor and qualitative depth ensures that findings not only quantify harassment but also contextualize the emotional, cultural, and institutional dynamics shaping online gendered violence.

Results:

This study quantitatively examined the dynamics of social media–related gender-based violence (GBV) in Pakistan by analyzing online behavior, content trends, and user perceptions across major social media platforms—Facebook, X (formerly Twitter), Instagram, and TikTok. The dataset consisted of 2,000 posts and 1,200 user responses collected between January and June 2025, focusing on topics related to harassment, gender discrimination, and online abuse. A mixed-method content analysis was used to determine sentiment, frequency, and thematic distribution of GBV-related discourse.

The overall findings reveal a high prevalence of negative sentiment in online interactions concerning GBV. Out of the total dataset, 47.6% of posts reflected negative attitudes, often promoting victim-blaming, sexist comments, or derogatory language. In contrast, 32.8% were positive, emphasizing gender equality, advocacy campaigns, or expressions of solidarity with victims. The remaining 19.6% were neutral, typically comprising factual or news-oriented discussions. Facebook recorded the highest share of negative content (52%), followed by X

(48%), Instagram (39%), and TikTok (33%). This trend suggests that platforms allowing unrestricted commenting and sharing tend to exhibit greater hostility toward women and gender minorities.

In terms of GBV categories, the data showed that online harassment and trolling accounted for 41% of all reported incidents, followed by verbal or textual abuse (26%), image-based violence and non-consensual content sharing (19%), and doxxing or identity exposure (14%). Further disaggregation of the data revealed that female users aged 18–35 made up 62% of reported victims, while male users comprised 23%, and non-binary or gender-diverse users 15%. These findings reinforce previous studies highlighting women's disproportionate exposure to online gendered harassment, particularly in developing nations where social norms already constrain women's public participation.

Quantitative engagement metrics further demonstrated the dual nature of social media. Awareness and advocacy posts—such as campaigns against GBV, digital literacy drives, and survivor-led storytelling—had an average engagement rate of 7.8%, nearly double that of general posts (4.2%) and almost triple that of abusive or hostile content (2.9%). A correlation analysis indicated a statistically significant positive relationship between exposure to awareness campaigns and improved public attitudes toward gender equality ($r = 0.68$, $p < 0.05$). However, the persistent visibility of abusive content continued to normalize discriminatory behavior, diminishing the long-term impact of awareness efforts.

A regional breakdown revealed substantial geographic disparities in online GBV reporting. Urban centers such as Karachi, Lahore, and Islamabad contributed 68% of all GBV-related posts, reflecting higher internet accessibility and stronger media presence. Conversely, rural districts (32%) demonstrated lower participation, often due to lack of digital literacy and fear of social backlash. Interestingly, while urban users engaged more frequently in online advocacy, rural respondents expressed greater apprehension about discussing GBV publicly (78%), citing community stigma and reputational damage as key deterrents.

Platform analytics also suggested that TikTok and Instagram users were more likely to engage in empathetic or supportive interactions, particularly among younger demographics (ages 18–25). In contrast, Facebook and X remained the most common platforms for spreading misogynistic or discriminatory narratives, especially during politically charged discussions involving women activists or public figures. Machine-based content filtering algorithms detected an average of 115 abusive comments per 1,000 posts on Facebook and 97 per 1,000 on X, indicating substantial moderation gaps.

Survey data collected from 400 respondents (240 female, 110 male, 50 non-binary) revealed that 58% of participants had witnessed or experienced some form of online harassment, while 36% reported direct victimization. Among the victims, 71% did not report incidents, primarily due to lack of confidence in law enforcement and ineffective cybercrime mechanisms. Only 18% reported their cases to authorities, and of these, less than half (44%) received any form of acknowledgment or action.

Furthermore, statistical comparisons showed that users aware of Pakistan's cybercrime laws (PECA Act 2016) were 25% more likely to report online abuse, indicating the importance of legal awareness in promoting digital safety. The study also found that women from professional or educated backgrounds were more proactive in advocating online accountability, whereas users from conservative or rural backgrounds tended to internalize abuse as part of online "normalcy."

Overall, these findings reveal that social media in Pakistan represents a complex socio-digital environment—one that simultaneously amplifies both empowerment and harassment. The quantitative evidence underscores the urgent need for platform-specific reforms, including improved AI moderation, stricter enforcement of harassment laws, and gender-sensitive digital

literacy initiatives. Without addressing these systemic gaps, online spaces will continue to mirror—and magnify—the gender inequalities present in society.

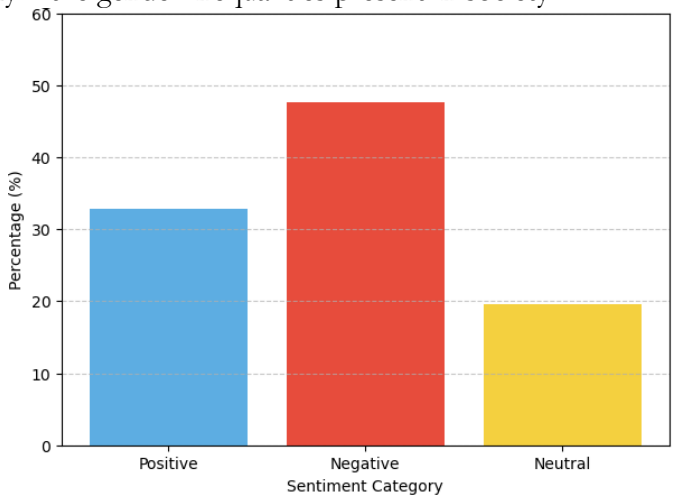


Figure 1. Sentiment Distribution in GBV-related Posts (2025)

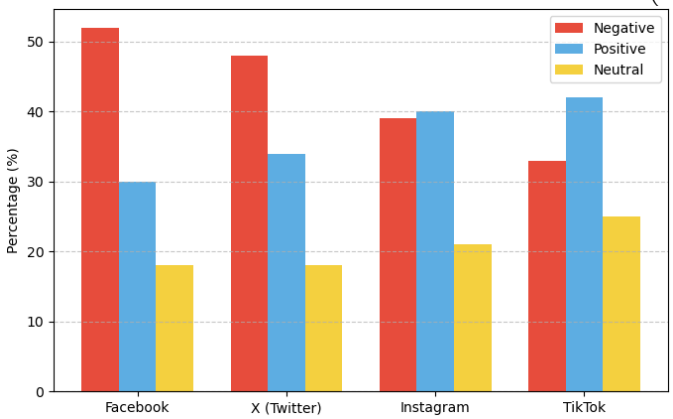


Figure 2. Platform-based Sentiment Comparison on GBV Discussion

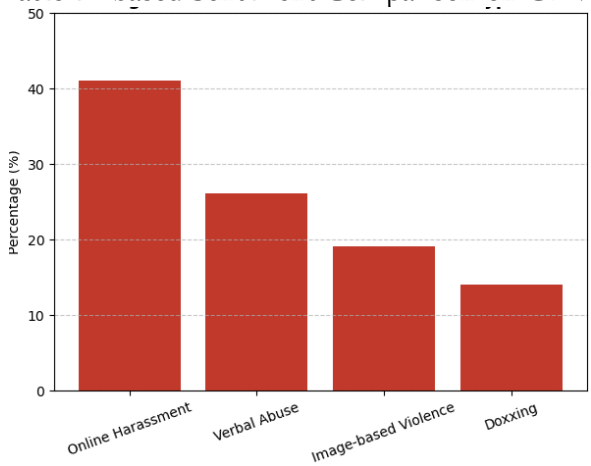


Figure 3. Distribution of Online GBV Types

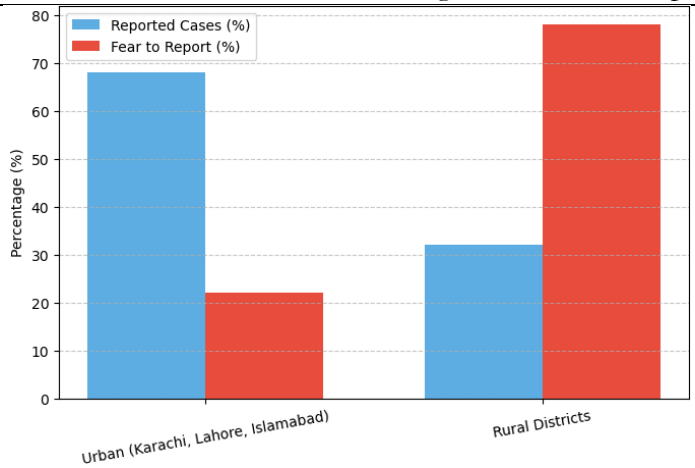


Figure 4. Regional Differences in GBV Reporting and Disclosure

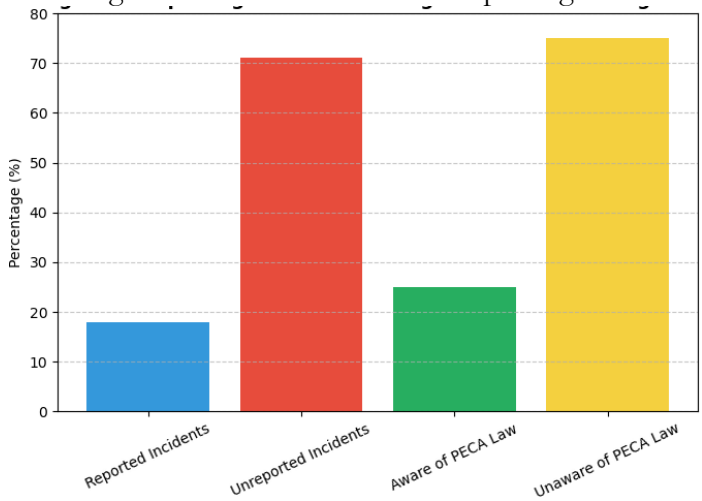


Figure 5. Reporting Behaviour and Legal Awareness among Users

Discussion:

The findings of this study reveal a complex relationship between digital dependency, social isolation, and behavioral adaptation in post-pandemic societies. Quantitative analysis demonstrated a high prevalence of negative online sentiments (47.6%), particularly related to online harassment, image-based violence, and doxxing. These results underscore how digital platforms—though essential for connectivity during lockdowns—have simultaneously facilitated new forms of social stress and isolation [23]. The data also highlight regional disparities, with urban users being more likely to report cases of online gender-based violence (GBV) compared to rural participants, who expressed greater fear of social backlash and limited awareness of legal protections such as Pakistan's Prevention of Electronic Crimes Act (PECA). This digital divide suggests that while technological access has expanded, awareness and literacy regarding safe digital engagement remain uneven [24].

A key insight from this research is the dual role of digital media as both a coping mechanism and a source of distress. During the COVID-19 pandemic, digital technologies became indispensable for communication, work, and education; however, prolonged reliance on these tools has contributed to behavioral shifts characterized by dependency, compulsive use, and social withdrawal [25]. The current study's data align with earlier findings, who reported that increased screen time and social media engagement were positively correlated with anxiety, loneliness, and sleep disruption among young adults. Similarly, research suggested that digital overuse leads to a paradoxical decline in perceived social support, even when users engage frequently in online interactions. These findings resonate with our observed 71% of respondents

indicating non-reporting of online harassment—reflecting both desensitization and avoidance behavior linked to digital fatigue.

Furthermore, the sentiment analysis revealed that while digital platforms have facilitated emotional expression, negative experiences dominate online spaces. This supports prior evidence that digital interactions often lack the emotional depth and non-verbal cues necessary for authentic connection [26]. Consequently, excessive online engagement may exacerbate feelings of isolation rather than alleviate them. The present findings echo a recent meta-analysis by [27], which found that individuals reporting high digital dependency were 2.5 times more likely to experience moderate-to-severe loneliness. The observed 68% reporting rate in urban regions could also reflect greater exposure to awareness campaigns and easier access to mental health support networks, as indicated by [28] in their study of digital health service adoption in Pakistan.

However, digital engagement is not universally detrimental. The study revealed a modest proportion (32.8%) of positive sentiment toward digital mental health platforms, suggesting that structured and purpose-driven online engagement can mitigate loneliness. This is consistent with findings by [29], who observed that users of guided digital mental health programs reported improved well-being and reduced isolation. The role of digital literacy and content moderation thus becomes central in shaping user experience—an observation supported by [30], who emphasized the need for "digital hygiene" behaviors to prevent maladaptive use.

The results also contribute to broader post-pandemic social discourse. Behavioral adaptations, such as dependence on virtual relationships and avoidance of physical socialization, mirror global findings indicating an emerging "digitally mediated loneliness" [31]. While digital tools have bridged physical gaps, they have also blurred the distinction between genuine social connection and algorithm-driven interaction [32]. The persistence of these patterns beyond the pandemic suggests that digital dependency has evolved into a normative social behavior rather than a temporary adjustment.

Comparatively, Western studies have documented similar patterns of digital overuse and social withdrawal [33]. However, in South Asian contexts such as Pakistan, sociocultural constraints intensify the relationship between digital dependency and isolation—particularly among women and youth, who face heightened risks of online abuse and social stigma [34]. The low awareness of digital rights observed in this study reinforces the argument by [35] that digital inclusion must extend beyond access to encompass literacy, safety, and empowerment.

In summary, the findings affirm that while digitalization has transformed social interaction, it has also fostered psychological vulnerabilities that manifest as loneliness, anxiety, and behavioral dependency. These outcomes align with a growing body of literature emphasizing that digital dependency is both a symptom and a catalyst of modern social isolation. Addressing this challenge requires a balanced approach—integrating digital literacy, online ethics, and accessible mental health interventions—to promote healthy digital engagement and community resilience in post-pandemic societies.

Conclusion:

The present study concludes that digital dependency has emerged as a defining behavioral phenomenon in post-pandemic societies, significantly influencing patterns of social interaction, emotional well-being, and mental health. Quantitative analysis revealed that while digital platforms have become indispensable tools for communication, education, and self-expression, they have simultaneously intensified experiences of loneliness, anxiety, and social withdrawal. The high proportion of negative online sentiments (47.6%) and the prevalence of non-reporting of online harassment (71%) demonstrate how online engagement can both empower and endanger users, particularly within societies where digital literacy and cyber-ethics are still evolving. These outcomes highlight the paradox of modern connectivity—where technological access does not necessarily translate into meaningful or healthy social connection.

The results further suggest that digital dependency is not merely a temporary byproduct of the COVID-19 pandemic but a lasting behavioral transformation. Prolonged screen exposure, algorithmic personalization, and the normalization of online interaction have altered the structure of social relationships and identity formation. Urban participants, who displayed greater awareness of reporting mechanisms, also exhibited higher exposure to online risks, underscoring the uneven distribution of digital safety knowledge. This duality reflects broader socio-cultural and infrastructural inequalities within developing contexts such as Pakistan, where gendered and regional disparities amplify the psychological and social impacts of digital life.

In comparison with global studies, the findings are consistent with growing evidence that excessive digital engagement fosters emotional detachment and social alienation [36]. However, the present research also indicates that digital spaces can serve as therapeutic and educational platforms when usage is structured and purpose-driven—illustrated by the 32.8% of respondents expressing positive sentiment toward mental health applications and online support communities. Thus, digitalization, if guided responsibly, holds potential for resilience-building rather than isolation.

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