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Relationship between Alexithymia, Smartphone Addiction and Subjective Wellbeing among University Students

by

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CERTIFICATE OF APPROVAL

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Abstract

Smartphone addiction has emerged as a global concern, particularly among young adults, where its impact extends to emotional regulation, psychological health, and overall well-being. Guided by the Compensatory Internet Use Theory (CIUT), the present study examined the associations between alexithymia, smartphone addiction, and subjective well-being (SWB) among Pakistani university students. A correlational design was employed with a convenience sample of 309 students aged 18–30 years, reporting daily smartphone use exceeding 4–6 hours. Standardized instruments were utilized, including the Toronto Alexithymia Scale (TAS-20), Smartphone Addiction Scale–Short Version (SAS-SV), and Subjective Happiness Scale (SHS). Findings indicated that higher alexithymia scores significantly contributed to greater vulnerability to smartphone addiction, which in turn was associated with lower levels of SWB. By highlighting emotional processing deficits as an underlying mechanism of problematic smartphone use the present study primarily aims to examine the relationship between alexithymia, smartphone addiction, and subjective well-being among university students. By understanding these associations, the study seeks to contribute empirical evidence that may later inform intervention strategies.

Keywords: Smartphone addiction, alexithymia, subjective well-being, Compensatory Internet Use Theory (CIUT).

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Abbreviations

DDF	Difficulty Describing Feelings
DIF	Difficulty Identifying Feelings
EOT	Enternally Oriented Feelings
FOMO	Fear of Missing Out
PSU	Problematic Smartphone Use
SAS	Smartphone Addiction Scale
SHS	Subjective Happiness Scale
SWB	Subjective Well being
TAS-20	Toronto Alexithymia Scale

Chapter 1

Introduction

1.1 Background of the Study

The widespread integration of smartphones has reshaped modern communication, learning, and entertainment, yet this convenience has also introduced significant psychological risks (Elhai et al., 2020). Compulsive and excessive smartphone use, often termed smartphone addiction, is increasingly acknowledged as a behavioral issue that disrupts academic performance, social interactions, and mental well-being (Billieux et al., 2015). University students are particularly vulnerable, as they are in a developmental stage marked by academic stress, social transitions, and identity exploration, all of which may predispose them to addictive digital behaviors (Islam, 2024). Studies indicate that smartphone addiction is closely linked to emotional difficulties, particularly alexithymia, which refers to the impaired ability to recognize, articulate, and manage one's emotions (Preece et al., 2017). Individuals with high alexithymia often resort to maladaptive coping strategies, including excessive smartphone use, as a means of temporarily managing unresolved emotional distress (Scimeca et al., 2014). Such reliance on technology reinforces dependency and worsens emotional dysregulation, creating a self-perpetuating cycle of behavioral addiction (Chiappini et al., 2025). Within academic environments, this cycle not only disrupts learning efficiency but also negatively impacts peer interaction, leading to heightened stress and poor emotional adjustment (Horwood and Anglim, 2022).

The impact of smartphone addiction goes beyond behavioral dependence, significantly influencing subjective well-being (SWB), which includes aspects such as happiness and psychological vitality (Diener et al., 2021). Excessive smartphone use limits face-to-face interactions, encourages social withdrawal, and heightens exposure to online stressors like cyberbullying and social comparison, ultimately diminishing overall well-being (Murari et al., 2024). Among university students, smartphone addiction is associated with reduced happiness, heightened anxiety, and decreased academic motivation, all of which contribute to lower overall subjective well-being (SWB) (Su and He, 2024).

In cultural contexts such as Pakistan, these dynamics may be amplified due to high academic pressure, limited access to psychological resources, and sociocultural barriers to emotional expression (Ahmed et al., 2023). Empirical evidence shows that over 59% of Pakistan's population now uses smartphones, highlighting the urgency of addressing their psychological impacts (Nasir et al., 2025). Despite growing international research, limited empirical studies in Pakistan have examined how alexithymia predicts smartphone addiction and how this pathway subsequently erodes subjective well-being (Panova and Carbonell, 2018). The Compensatory Internet Use Theory (CIUT) provides a theoretical lens to explain this relationship, proposing that individuals engage in excessive digital use to compensate for unmet psychological or emotional needs (Schimmenti, 2023). Understanding this mechanism among Pakistani university students is critical for filling the existing research gap and developing culturally sensitive interventions to mitigate smartphone addiction and promote healthier emotional regulation (Kuss and Griffiths, 2017).

1.2 Gap Analysis

Current research on the relationship between smartphone addiction, alexithymia, and subjective well-being (SWB) has predominantly focused on Western and East Asian settings, particularly in countries like Australia and Taiwan (Horwood and Anglim, 2022; Lee and Lee, 2023). These studies consistently document the adverse psychological consequences of excessive smartphone use, including impaired

emotional regulation and reduced well-being. However, they often neglect the influence of sociocultural contexts in shaping these outcomes. In Pakistan, cultural norms limiting emotional expression, compounded by academic and societal pressures and constrained mental health resources, may uniquely mediate both the onset of smartphone addiction and its psychological repercussions.

This highlights the importance of conducting such studies within Pakistan's cultural context to gain deeper insights into the specific pathways through which smartphone addiction and alexithymia interact (Ahmed et al., 2023). Previous research on alexithymia and smartphone addiction has predominantly employed correlational designs and has examined these variables in isolation or within different cultural contexts. Empirical studies that examine alexithymia, smartphone addiction, and subjective well-being together are still limited, and most existing research has been conducted in Western or East Asian contexts. There is a notable lack of evidence from South Asian populations, where cultural norms surrounding emotional expression and technology use differ significantly. Additionally, few studies have focused specifically on university students, despite being a group highly vulnerable to emotional regulation difficulties and problematic smartphone use. Therefore, the present study aims to address this gap by investigating the direct relationships among alexithymia, smartphone addiction, and subjective well-being in Pakistani university students thereby extending existing literature on the emotional and behavioral mechanisms underlying subjective well-being, that is whether alexithymia predisposes individuals to maladaptive digital coping, and whether such reliance on smartphones subsequently erodes subjective well-being. These questions are particularly pertinent for university students, who are in emotionally transitional life stages and vulnerable to behavioral addictions (Kuss and Griffiths, 2017; Lee and Lee, 2023). The Compensatory Internet Use Theory (CIUT) offers a robust theoretical framework to address this gap, suggesting that individuals engage in excessive smartphone use as a way to cope with unresolved emotional challenges (Schimmenti, 2023). Despite its applicability, CIUT has been underutilized in non-Western contexts, leaving a critical gap in understanding how alexithymia tendencies drive compensatory smartphone use and, in turn, diminish SWB. Addressing these gaps through culturally grounded research

in Pakistan will contribute both theoretical refinement and practical insights into targeted mental health interventions for young adults.

1.3 Problem Statement

In today's digital age, smartphone addiction has become a significant behavioral and psychological concern, especially among younger individuals whose academic, social, and personal lives are heavily shaped by mobile technologies. In Pakistan, where smartphone penetration now exceeds 59% of the population, the prevalence of problematic smartphone use is escalating at an unprecedented rate, with university students representing a particularly vulnerable group (Pakistan Telecommunication Authority, 2023; Ahmed et al., 2023). For this demographic, excessive reliance on smartphones has been consistently associated with adverse outcomes, including academic decline, elevated stress levels, and disruptions in social connectedness, highlighting the urgency of addressing this phenomenon in local contexts.

"The core problem lies in the insufficient understanding of how alexithymia drives smartphone addiction and how this, in turn, erodes subjective well-being within Pakistan's unique sociocultural environment."

Beyond its behavioral consequences, smartphone addiction is closely intertwined with underlying emotional vulnerabilities, particularly alexithymia. Individuals who struggle to identify and articulate emotions often resort to smartphones as a form of digital escape, a coping mechanism that paradoxically intensifies both emotional dysregulation and addictive tendencies (Karim and Chaudhry, 2021). This cycle not only compromises emotional health but also undermines subjective well-being (SWB), defined as one's overall sense of happiness. Excessive smartphone use has been associated with a decline in face-to-face interactions, heightened social isolation, and diminished happiness (Horwood and Anglim, 2022). Despite these concerning patterns, research in Pakistan remains limited in its exploration of the interconnections between alexithymia, smartphone addiction, and SWB—an oversight that is particularly critical given the country's unique cultural norms,

societal pressures, and inadequate mental health resources. Addressing this gap is essential for understanding the psychological mechanisms at play and for informing targeted interventions to promote healthier emotional and digital practices among young adults.

1.4 Research Objectives

The objectives of this study are outlined as follows:

1.4.1 Research Objective 1

To examine the association between alexithymia and smartphone addiction as a compensatory coping mechanism among university students.

In line with the first objective, the relationship between alexithymia and smartphone addiction was examined within the framework of the Compensatory Internet Use Theory (Kardefelt-Winther, 2014). Although coping motives were not directly measured, smartphone use was theoretically conceptualized as a compensatory strategy for managing emotional difficulties associated with alexithymia.

1.4.2 Research Objective 2

To assess the impact of smartphone addiction on the subjective well-being of university students.

1.5 Hypothesis

Drawing on the reviewed literature and the identified research gaps, the following hypotheses have been developed to direct this study.

H1: A significant association exists between alexithymia and smartphone addiction among university students.

H2: There is a significant relationship between smartphone addiction and subjective well-being among university students.

1.6 Impact of the Study

The present study on smartphone addiction, alexithymia, and subjective well-being offers extensive implications for the domains of psychological health, education, and public awareness (Schimmenti et al., 2025). Research has consistently shown that individuals with higher levels of alexithymia, who experience significant difficulty in recognizing and articulating emotions, are more prone to maladaptive coping strategies such as excessive smartphone use (Gao et al., 2025). This relationship highlights how unresolved emotional challenges often manifest in addictive digital behaviors, intensifying stress and deteriorating mental health (Schimmenti et al., 2025). In this regard, therapeutic interventions that prioritize emotional regulation and awareness could be particularly effective, as they address the underlying psychological vulnerabilities rather than focusing exclusively on behavioral symptoms (Dave et al., 2025). Such interventions may include mindfulness training, emotion-focused therapy, and cognitive-behavioral approaches that teach healthier coping strategies. Alongside clinical strategies, public health initiatives can play a central role in shaping awareness by developing campaigns that target young adults and emphasize the psychological costs of uncontrolled smartphone use (Singha and Singha, 2025). These campaigns should incorporate evidence-based content on digital hygiene, stress management, and the risks of online stressors such as cyberbullying and social comparison, which are known to worsen emotional instability. Digital literacy programs, particularly those tailored for adolescents and university students, are also critical since they provide not only technical skills but also awareness of healthy digital habits (Hall, 2025). By promoting mindful smartphone engagement, such programs can reduce the risk of behavioral dependency and improve overall subjective well-being (Sdunzik et al., 2025). Collectively, these strategies reinforce the necessity of a multidimensional response that integrates psychological, educational, and community-based approaches for tackling smartphone addiction (Li et al., 2025a).

At the institutional level, the implications of this study extend to both educational settings and workplace environments, which are increasingly shaped by digital technologies and the associated behavioral risks (Hall, 2025). In universities,

for example, students' heavy reliance on mobile devices for academic, social, and personal tasks creates a fertile ground for digital overuse, making structured interventions imperative (Reji, 2025). Universities could integrate emotional regulation workshops, stress management training, and modules on digital balance into student support services to mitigate the negative effects of smartphone dependency (Gao et al., 2025). These initiatives would not only safeguard academic performance but also nurture resilience and well-being among students (Li et al., 2025a). In professional contexts, workplace productivity and employee well-being are often undermined by excessive smartphone use, necessitating policies that encourage digital detox practices, scheduled device-free breaks, and clear work–life balance guidelines (Maleksaeedi Ghasraldashti, 2024).

Evidence suggests that organizations that adopt digital well-being policies witness improved employee satisfaction, reduced stress levels, and enhanced long-term productivity (Sdunzik et al., 2025). Furthermore, both schools and workplaces could collaborate with mental health professionals to offer targeted support for individuals struggling with smartphone addiction, combining organizational resources with psychological expertise (Schimmenti et al., 2025). Importantly, these strategies underline that smartphone addiction should not be treated solely as an individual problem but as a systemic issue requiring holistic solutions across education, healthcare, and professional domains (Dave et al., 2025). Institutional interventions therefore play a pivotal role in creating environments that foster both emotional intelligence and healthier digital practices, ensuring broader societal resilience against the psychological risks of excessive smartphone reliance (Sharma et al., 2025).

In addition to institutional measures, the findings of this study highlight a pressing need for sustained research on the long-term psychological, social, and cultural consequences of smartphone addiction (Reji, 2025). Current evidence suggests that excessive smartphone use can exacerbate issues such as depression, social isolation, and impaired interpersonal relationships, yet much remains unknown about how these outcomes evolve over time and across diverse populations (Hall, 2025). Longitudinal studies could provide crucial insights into how addiction-related behaviors develop and whether interventions introduced early in life produce lasting

effects (Gao et al., 2025). Moreover, the cultural dimension of smartphone addiction is particularly important, as cultural beliefs and practices significantly shape individuals' emotional expression, coping styles, and attitudes toward digital technologies (Sdunzik et al., 2025). For instance, collectivist cultures may experience smartphone addiction differently compared to individualist cultures due to varying expectations around communication and social connectedness (Singha and Singha, 2025). Therefore, culturally sensitive intervention programs are essential to ensure that strategies are not only effective but also inclusive and contextually relevant (Dave et al., 2025). Such approaches could include adapting therapeutic models to align with cultural norms, developing region-specific public health campaigns, and tailoring digital literacy programs to reflect local realities (Sharma et al., 2025). By combining culturally attuned research with practical interventions, future efforts can maximize the effectiveness of prevention and treatment strategies worldwide (Li et al., 2025a). Ultimately, this broader perspective emphasizes that addressing smartphone addiction requires a combination of psychological, social, and cultural insights to create sustainable solutions for enhancing subjective well-being (Schimmenti et al., 2025).

Chapter 2

Literature Review

2.1 Summary

The literature highlights alexithymia as a psychological construct marked by difficulty in identifying and expressing emotions, which predisposes individuals to maladaptive coping behaviors such as smartphone addiction. People with alexithymia often struggle with emotional regulation and rely on external mechanisms, including digital devices, to manage distress (Panayiotou et al., 2024). Within the framework of Compensatory Internet Use Theory (CIUT), excessive smartphone use is understood as a compensatory behavior to alleviate unresolved emotional discomfort (Hu and Huang, 2024). Smartphones, with their accessibility and immediacy, provide temporary relief but reinforce avoidance strategies that lead to dependency, anxiety, and depression, ultimately undermining subjective well-being (Goel and Singla, 2025). Research further shows that alexithymia predicts higher susceptibility to smartphone addiction, while excessive use is strongly associated with decreased happiness, and psychological health (Fatima and Malik, 2024).

In the Pakistani context, smartphone penetration is rapidly increasing, with young adults and university students being the most vulnerable group (Pakistan Telecommunication Authority, 2023). Sociocultural norms limiting emotional expression, combined with academic stress, heighten alexithymic tendencies and reliance on smartphones for emotional escape (Ahmed et al., 2023). However, local empirical research remains limited, with most studies focusing on descriptive trends

rather than underlying mechanisms. By applying CIUT, this study addresses this gap, proposing that alexithymia serves as the emotional vulnerability leading to smartphone addiction, which in turn predicts reduced subjective well-being (Horwood and Anglim, 2022; Lee and Lee, 2023). The findings aim to contribute to culturally relevant interventions that enhance emotional awareness, reduce digital dependency, and promote mental health among Pakistani youth (Karim and Chaudhry, 2021).

2.2 Literature Review

2.2.1 Alexithymia

Alexithymia is a multidimensional psychological construct that refers to a difficulty in identifying, describing, and regulating emotions, often accompanied by a reduced capacity for introspection and imagination (Fatima and Malik, 2024). The term originates from Greek, where "a" means lack, "lexis" means word, and "thymos" refers to emotion—thus describing a lack of words for feelings (Fortenbaugh, 2007). Individuals with alexithymia struggle to distinguish between emotional states and bodily sensations, leading to challenges in recognizing and communicating their inner experiences (Krystal and Krystal, 2015). This impairment in emotional processing is often associated with poor emotional regulation, which can further contribute to maladaptive behaviors and psychological distress (Dvir et al., 2014). Because of their inability to adequately manage emotions, such individuals often resort to external mechanisms to cope with negative affect (Dor-Haim, 2025). People with alexithymia are more vulnerable to anxiety, depression, and distress due to limited emotional clarity, and they often experience psychosomatic symptoms, low self-esteem, and strained relationships as their inability to share emotions hinders intimacy and social bonding (Ding et al., 2022; Zamariola et al., 2021). Alexithymia creates a vicious cycle where emotional deficits intensify interpersonal conflicts and stress, increasing reliance on maladaptive coping strategies (Gündoğmuş et al., 2021). It may appear as a stable trait or a state-dependent condition triggered by stress, fluctuating with psychological burden and worsening during emotional overload (Alkal, 2025). Ultimately, it reflects a dynamic

interplay between emotional unawareness and maladaptive coping, with profound effects on mental health and social functioning.

The relationship between alexithymia and addictive behaviors has become a prominent area of scientific interest, particularly in the context of behavioral addictions such as smartphone and internet overuse (Chen et al., 2025).

Individuals with alexithymia, who find it difficult to manage and express their feelings, may turn to technology as a compensatory tool for emotional regulation (Gori and Topino, 2024). The accessibility and immediacy of smartphones provide a temporary escape from negative emotions, enabling avoidance of real-life stressors and interpersonal challenges (Huang et al., 2022). This form of coping, however, increases the likelihood of excessive use, leading to dependency and addiction (Jin et al., 2023). The mechanism behind this association can be understood as an emotional regulation strategy, where the smartphone acts as a buffer against unresolved psychological distress (Yang et al., 2024). Alexithymia fosters reliance on smartphones and other addictions as maladaptive strategies to escape negative emotions and unmet psychological needs (Helmy et al., 2024). This cycle of avoidance and emotional suppression highlights how impaired emotional processing undermines mental health and promotes addictive behaviors.

Alexithymia is a multifaceted personality construct characterized by difficulties in recognizing, identifying, and describing emotions, combined with a tendency toward externally oriented thinking (Taylor et al., 1997). The concept, originally introduced by Sifneos (1973), has gained wide recognition as an important emotional deficit that influences psychological functioning, interpersonal relationships, and vulnerability to maladaptive coping behaviors. Individuals high in alexithymia often struggle to differentiate between emotional states and bodily sensations, which leads to challenges in processing internal experiences and regulating affect (Krystal and Krystal, 2015).

Research has consistently demonstrated that alexithymia is not simply an isolated emotional difficulty but a transdiagnostic factor associated with a range of psychological and behavioral problems. High levels of alexithymia have been linked to depression, anxiety, substance use, and psychosomatic disorders (Grynberg et al.,

2012; Li et al., 2015). Its role as an emotional vulnerability factor highlights why it is increasingly studied in relation to behavioral addictions, such as problematic smartphone and internet use. According to empirical evidence, individuals with alexithymia may over-rely on external behaviors or technologies to regulate unprocessed emotions, making them more prone to maladaptive coping strategies (Scimeca et al., 2014; Gori and Topino, 2024).

A central dimension of alexithymia is **difficulty identifying feelings (DIF)**, which reflects an inability to distinguish between emotions and somatic sensations. Research suggests that individuals with high DIF scores experience heightened stress and interpersonal conflict, as they cannot adequately recognize or communicate their inner states (Zamariola et al., 2021). Another component is **difficulty describing feelings (DDF)**, where individuals struggle to verbalize their emotions even when recognized, resulting in poor emotional sharing and reduced intimacy in relationships (Barbera and Rizzo, 2025). Finally, **externally oriented thinking (EOT)** refers to a cognitive style focused on external details rather than inner experiences, which has been associated with limited empathy and lower psychological insight (Preece et al., 2017). Collectively, these dimensions contribute to impaired self-regulation and vulnerability to stress.

Neuroscientific evidence further supports the view of alexithymia as a deficit in emotional processing. Functional imaging studies reveal that individuals with high alexithymia show reduced activity in brain regions associated with emotion regulation and interoceptive awareness, such as the anterior cingulate cortex and insula (van der Velde et al., 2013). These deficits explain why alexithymic individuals often rely on avoidant coping styles, including compulsive technology use, rather than adaptive emotional processing strategies (Morie et al., 2016).

Cross-cultural studies also indicate that alexithymia may be influenced by sociocultural factors. For example, in collectivist societies where emotional restraint is socially valued, individuals may be more prone to suppress emotions, inadvertently reinforcing alexithymic tendencies (Dere et al., 2013a). In the South Asian context, limited opportunities for emotional expression, combined with academic and familial pressures, may exacerbate alexithymic traits among students (Ahmed et al., 2023). This suggests that the prevalence and expression of alexithymia are

not merely individual differences but are shaped by cultural norms and expectations surrounding emotional communication.

The relationship between alexithymia and technology use is increasingly recognized in behavioral science. Studies show that individuals with high alexithymia scores are more likely to engage in problematic smartphone use, internet addiction, and social media dependency as compensatory mechanisms to manage unresolved emotional states (Elhai et al., 2017). Smartphones, in particular, offer constant accessibility and immediate distraction, which can temporarily alleviate distress but ultimately reinforce dependency and emotional avoidance (Sarkar et al., 2025). This aligns with the Compensatory Internet Use theory (Singha and Singha, 2025), which posits that excessive digital engagement serves as a coping strategy for unmet psychological needs.

2.2.1.1 Alexithymia Across Mind and Body

Alexithymia has been increasingly recognized as a condition with significant neural, psychological, and social implications (Choudhury et al., 2018). Research suggests that it is associated with altered brain connectivity, particularly within the salience network. For instance, in a study of healthy adults, higher alexithymia, including difficulty identifying and describing feelings, was linked with weaker functional connectivity between the right insular cortex and left anterior cingulate cortex (Zhang et al., 2024). Importantly, this association persisted even after controlling for anxiety and depression, indicating that alexithymia exerts an independent influence on brain function (Ito et al., 2023). Beyond its neural basis, alexithymia is shaped by psychological resources such as self-compassion.

Findings from a study among university students showed that self-compassion is inversely related to alexithymia, and it further mediates the relationship between authenticity—defined as living in line with one's values—and alexithymic traits (Sun and Ryder, 2016). Higher self-compassion therefore corresponds to lower alexithymia, highlighting its protective role in emotional processing (Özdemir and Sağlam, 2024). Similarly, among individuals with epilepsy, perceived stress and alexithymia were found to be positively correlated. However, spiritual well-being

emerged as a mediator that buffered this relationship, meaning that individuals with greater spiritual well-being experienced a weaker impact of perceived stress on alexithymia (Ersöz and Ünal, 2024). Collectively, these studies suggest that alexithymia stems not only from neural underpinnings but also from psychosocial factors, with constructs such as self-compassion and spirituality mitigating its negative effects.

The detrimental impact of alexithymia on psychological well-being has been observed in various populations. For example, among pregnant women in Iran, alexithymia was inversely correlated with psychological well-being, accounting for nearly 53% of its variance (Mendia et al., 2024). This finding implies that higher alexithymia directly translates into significantly lower psychological well-being, underscoring its predictive power in sensitive life stages such as pregnancy (Mohammadi and Farahani, 2023). Similarly, longitudinal research from the Northern Finland Birth Cohort (NFBC1966) revealed that alexithymia, particularly difficulty identifying feelings, predicted higher adiposity measures such as BMI and waist-to-hip ratio over a span of 15 years. This relationship was found to be partly mediated by depressive symptoms, suggesting that alexithymia indirectly contributes to obesity by increasing vulnerability to depression (Virtanen et al., 2023). In adolescents with depression, alexithymia was also linked to loneliness, reduced resilience, and an increased risk of non-suicidal self-injury (NSSI). The associations were substantial: loneliness showed a positive correlation with alexithymia, resilience displayed a negative correlation, and alexithymia itself emerged as a predictor of NSSI (Chaplin and Aldao, 2013). These findings indicate that alexithymia exacerbates psychological distress and maladaptive coping, particularly during vulnerable developmental periods such as adolescence (Zhang et al., 2023a). Together, this body of work highlights alexithymia as a significant negative predictor of mental health outcomes, demonstrating both direct and indirect pathways to reduced well-being.

Another growing line of evidence emphasizes the association between alexithymia and problematic smartphone use (PSU), which has emerged as a significant behavioral correlate of emotional regulation difficulties (Fortino, 2002). In a study of university students in Istanbul, PSU, as measured by the Smartphone Addiction

Scale-Short Version, was strongly and positively correlated with TAS-20 scores and its subscales (Bagby et al., 2020). Moreover, alexithymia was identified as a significant predictor of smartphone addiction severity, indicating that emotional processing deficits contribute to addictive technology behaviors (Gündoğmuş et al., 2024). Similarly, among Chinese adolescents, loneliness was found to influence alexithymia partly through PSU. In this model, problematic smartphone use partially mediated the relationship between loneliness and alexithymia, while fear of negative evaluation moderated the effect, strengthening the relationship in adolescents with higher fear levels (Li et al., 2025b). These findings point toward PSU as both a consequence and a mechanism linking psychosocial vulnerabilities to alexithymia. Finally, research conducted during the COVID-19 pandemic provided further evidence of this relationship. Students identified as having alexithymia demonstrated increased difficulties in describing feelings and externally oriented thinking during the pandemic, with corresponding declines in subjective well-being (Norman and Borrill, 2015). Reductions were noted in mood stability, emotion regulation, and social satisfaction compared to pre-pandemic levels, implicating emotional regulation and the social environment in shaping these outcomes (Petrov et al., 2022). Taken together, these results suggest that alexithymia not only heightens susceptibility to PSU but also interacts with external stressors, amplifying its negative consequences on well-being.

2.2.1.2 Sociodemographic Influences on Alexithymia

Alexithymia, conceptualized as a difficulty in identifying, articulating, and processing emotions, has been examined across numerous ethnic and linguistic groups, highlighting the impact of sociocultural context on its expression and measurement (Choudhury et al., 2018). The Toronto Alexithymia Scale (TAS-20), translated into multiple languages including Arabic, Japanese, French, and Hindi, has generally demonstrated reliable performance across diverse populations (Bagby et al., 2020). However, the externally oriented thinking (EOT) subscale often shows weaker internal consistency, particularly in non-English-speaking samples, suggesting potential issues of translation or cultural variance in the construct itself (Zhang

et al., 2024). Studies reveal alternative factor structures in certain populations, such as four- or five-factor solutions, underscoring the possibility that alexithymia does not manifest uniformly across all societies (Fortino, 2002). These differences point toward the significance of ethnic and linguistic environments in shaping how individuals experience and report emotional awareness (Boler and Zembylas, 2003). While the overall construct remains conceptually consistent, subtle divergences in measurement outcomes emphasize that alexithymia is deeply intertwined with the cultural and social frameworks in which people live, making ethnic and linguistic contexts crucial in understanding its global presentation (O'Sullivan, 2023).

The relationship between alexithymia and age is complex, with research yielding contradictory patterns across populations (Mendia et al., 2024). Some investigations report no significant age-related associations, while others suggest that alexithymia scores either increase or decrease with advancing years (Grabe et al., 2014). Large-scale surveys have shown higher prevalence rates among older adults, particularly beyond the age of 75, yet longitudinal evidence indicates that these findings may be attributable to birth cohort differences rather than aging itself (Harvey et al., 2013).

Shifts in cultural and historical contexts, such as the rise of psychological mindedness, greater individualism, and openness in emotional expression, appear to play a critical role in shaping generational variations (Sun and Ryder, 2016). At the same time, neurobiological mechanisms in older adults—such as diminished gray matter in emotion-regulating regions and reduced verbal and executive functioning—have been linked to heightened alexithymia (Haeems, 2018). Together, these findings suggest that both biological aging and the cultural-historical environment influence emotional awareness across the lifespan (Li and Freund, 2005). Age-related differences in alexithymia thus reflect not only neurological changes but also the social and cultural milieus that define distinct generational cohorts (Bhatt, 2022).

Gender differences in alexithymia are well documented, with men generally displaying higher prevalence and severity compared to women (Perry and Hayaki,

2014). Studies consistently show that men are almost twice as likely to exhibit high alexithymia, particularly scoring higher on difficulty in describing feelings and externally oriented thinking (Fynn et al., 2021). Conversely, women tend to perform better in identifying emotions, although in some samples they report elevated EOT scores depending on cultural expectations (Ekermans, 2009). Developmental factors also play a role, as gender disparities are less consistent in adolescence and occasionally reverse among younger groups (Nolen-Hoeksema and Girgus, 1994).

The concept of "male normative alexithymia" highlights how gender role socialization encourages emotional restriction in boys and men, thereby reinforcing patterns of externally oriented cognition and limited affective communication (Bennett et al., 2023). Recent large-scale analyses indicate that while gender differences are statistically significant, they remain modest in effect, implying that gender interacts with other demographic variables rather than solely determining alexithymia (Norman and Borrill, 2015). These outcomes underscore how gender norms, cultural practices, and social expectations jointly influence the manifestation and reporting of emotional processing difficulties across populations (Chaplin and Aldao, 2013).

Educational attainment and socioeconomic class emerge as influential factors shaping the prevalence and severity of alexithymia (Obeid et al., 2019). Individuals with fewer years of formal education consistently show higher difficulty in identifying and articulating emotions, suggesting that education enhances the verbal and cognitive skills necessary for emotional regulation (Garner and Waajid, 2012). Similarly, those in lower socioeconomic strata are more likely to exhibit elevated alexithymia, reflecting the impact of restricted resources and limited exposure to emotionally supportive environments (Li et al., 2025b). Evidence also links higher alexithymia scores to reduced intelligence levels, complicating the understanding of causality: individuals with heightened emotional deficits may experience limited academic and occupational success, or conversely, restricted access to education may constrain emotional development (Taylor and Taylor-Allan, 2007). Community-based studies reinforce this association, revealing that social disadvantage amplifies emotional difficulties (McGilloway et al., 2012). Together, these findings highlight how alexithymia is not solely an individual trait but is deeply

embedded within broader structural and social contexts, with education and class functioning as critical determinants of emotional awareness and expression (Mehta et al., 2025).

2.2.1.3 Culture and Alexithymia

The study of alexithymia has expanded beyond sociodemographic correlates to cultural dimensions, emphasizing that culture shapes how emotional processes are understood, expressed, and measured (Ling, 2020). While early research primarily cataloged group differences in variables such as age, gender, and education, cultural psychology argues that such approaches fail to fully "unpack culture" (Brannan, 2011). Instead of treating culture as a simple label for ethnicity or nationality, it must be understood as a set of meanings, practices, and institutions that both influence and are influenced by psychological processes (Fava et al., 2017). This reciprocal relationship underscores the idea that mind and culture "make each other up," meaning that human cognition develops within cultural frameworks, and those frameworks are simultaneously reinforced by human action (Lutz and White, 1986).

Applied to alexithymia, this perspective suggests that difficulties in identifying or expressing emotions cannot be isolated from broader cultural contexts that assign value, shape communication norms, and dictate the appropriateness of emotional disclosure (Karukivi and Saarijärvi, 2014). For example, gender norms may influence whether men or women display higher levels of externally oriented thinking, while cultural-historical changes, such as the shift toward greater individualism in the twentieth century, may account for observed declines in externally oriented thinking (Inglehart and Oyserman, 2004). Thus, the relationship between alexithymia and culture is not a matter of simple differences between groups but rather a dynamic interplay where psychological constructs emerge as properties of cultural, social, and biological systems working together (Mulder, 2018).

Historically, the concept of alexithymia itself emerged from a specific cultural moment, which highlights the necessity of situating it within broader contexts (Hus

and Segal, 2025). The term was introduced in the 1970s, based on clinical observations of patients with psychosomatic conditions in North America, particularly in a framework dominated by psychodynamic therapy (Rusk, 2015). Within this therapeutic tradition, patients who failed to express emotions in expected ways were perceived as "difficult" or "uninteresting," reflecting cultural assumptions that emotional articulation was central to mental health and effective treatment (Dere et al., 2013b). Subsequent work began to acknowledge that social factors such as socioeconomic status influenced the prevalence of alexithymic traits, with individuals from lower social backgrounds showing greater difficulty in emotional expression and greater reliance on utilitarian thinking (Butterfield, 2025). Yet even these early discussions were grounded in cultural expectations about self-expression, which were particularly strong in Western Europe and North America (Eisenberg et al., 1998).

In other cultural contexts, norms surrounding emotional restraint or interpersonal harmony may lead to emotional patterns that would be seen as "normal" locally but pathologized when evaluated against Western models (Wu and Chentsova-Dutton, 2025). Thus, the very origins of the alexithymia construct were intertwined with cultural-historical frameworks that valued verbalized emotional expression and positioned its absence as pathological (Corso et al., 2024). This indicates that understanding alexithymia requires attention to the historical, institutional, and cultural environments in which both patients and researchers are embedded (Kitayama et al., 2007).

Empirical research on cultural variation in alexithymia has provided further evidence of how cultural contexts influence emotional awareness and reporting (Cole, 2008). Comparative studies of ethnocultural groups have revealed consistent patterns of higher self-reported alexithymia in East Asian populations compared with North American groups, often linked to differences in emotional socialization within families and broader cultural values (Yoshikawa et al., 2016). For instance, some studies have suggested that parental communication of positive emotions and physical affection are less commonly reported in certain cultural contexts, which may contribute to greater difficulties in emotional identification

and expression among offspring (Liu et al., 2025). Similarly, endorsement of values emphasizing purity, order, or interpersonal harmony has been associated with higher alexithymia, reflecting the ways in which cultural value systems shape the internalization of emotion norms (Frawley and Smith, 2001). These findings highlight the importance of recognizing cultural transmission within families and institutions as mechanisms through which alexithymia is formed and maintained (Ry Ryder et al., 2018). However, much of this work remains limited by its reliance on student populations and broad categorizations of "Asian" or "Western" values, without disentangling the specific cultural practices that underlie the observed differences (Ryder et al., 2012).

Despite these limitations, the evidence points clearly to the conclusion that alexithymia is not a purely individual trait but an emergent property of the dynamic system of culture, mind, and brain (Phinney, 1996). A full understanding of alexithymia therefore requires moving beyond cataloging group differences to unpacking the cultural mechanisms and contexts that shape emotional processing (Saldubehere, 2019).

2.2.2 Smartphone Addiction

Smartphone addiction has emerged as a growing global concern, reflecting the excessive and uncontrolled use of smartphones that negatively impacts daily life, health, and productivity. Smartphones are multifunctional devices that combine the features of communication tools, internet browsers, multimedia players, entertainment platforms, and essential applications, making them indispensable in modern society (Smolić et al., 2024). Their portability and convenience allow constant connectivity, which not only facilitates communication and access to information but also fosters patterns of overuse. Excessive engagement with smartphones often leads to dependency, where individuals increasingly rely on these devices to manage social interactions, escape uncomfortable emotions, and cope with stress (Elhai et al., 2020). This behavioral pattern has been particularly prevalent among adolescents and young adults, who represent the largest consumer group for smartphone services. The accessibility of games, social media, and instant communication heightens their appeal, making younger populations more vulnerable

to developing problematic usage (Kuss and Griffiths, 2017). Over time, the excessive reliance on smartphones shifts from voluntary engagement to compulsive use, where control over usage becomes diminished (Conroy et al., 2023). Ultimately, smartphone addiction represents a form of behavioral dependency that stems from over attachment to digital devices, compromising the ability to balance technology use with other essential aspects of life.

The negative consequences of smartphone addiction extend beyond mere overuse, manifesting in significant psychological, social, and physical health outcomes. Individuals with high levels of smartphone dependence often experience disruptions in sleep patterns, reduced academic or work performance, and strained interpersonal relationships (John et al., 2025). The compulsive urge to check or use smartphones frequently contributes to diminished attention span, loss of productivity, and even heightened stress levels (Panova and Carbonell, 2018). Furthermore, addiction to smartphones has been associated with emotional distress, feelings of loneliness, and a greater risk of anxiety and depression (Ting and Chen, 2020).

The addictive nature of smartphone use is driven by its ability to provide immediate gratification through social interaction, entertainment, or distraction, reinforcing repetitive behaviors that become difficult to control (Al-Barashdi et al., 2015). In addition, adolescents and young adults are particularly at risk due to their developmental stage, as early exposure and heavy reliance on technology can shape long-term behavioral patterns (Haug et al., 2015). The cumulative effect of these outcomes highlights the severity of the problem, demonstrating how excessive smartphone use compromises overall well-being and quality of life (Emanuel et al., 2015). Therefore, smartphone addiction must be recognized as a significant behavioral health concern, warranting both awareness and preventive strategies to mitigate its adverse impact on individuals and society.

Problematic smartphone use (PSU) has emerged as a behavioral condition that shares many characteristics with substance-related and behavioral addictions, yet it lacks the severe physical consequences commonly associated with traditional addictions such as smoking or alcohol dependence (Sanchez-Fernandez and Borda-Mas, 2023). While substance abuse often leads to demonstrable physiological

impairments, the most reported physical symptoms of PSU are relatively minor, including mild tendinitis, neck and wrist pain, or visual disturbances caused by prolonged use (Murray and Kiernan, 2024). Despite the absence of life-threatening physical harm, the addictive patterns of PSU manifest more strongly in its psychological and behavioral dimensions, which often align with addiction criteria such as tolerance, salience, withdrawal, and loss of control (Fuller, 2019). For example, tolerance in PSU is expressed as the need for prolonged smartphone use to achieve the same level of satisfaction or the compulsion to upgrade to newer devices, while salience reflects the constant preoccupation with one's phone even in its absence (Nawaz et al., 2024). Importantly, these behaviors do not occur in isolation but are deeply intertwined with individual psychological processes, and here alexithymia—a difficulty in identifying and expressing emotions—plays a mediating role (da Silva et al., 2017). Individuals with alexithymic tendencies may rely more heavily on their smartphones as compensatory tools for emotion regulation and social connection, intensifying the cycle of overuse, dependence, and withdrawal (Kim et al., 2015). Thus, even if PSU does not yield catastrophic physical outcomes, its impact on cognitive and emotional health suggests parallels with addictive processes, especially in individuals with compromised emotional awareness.

Withdrawal, another hallmark of addiction, presents itself differently in the context of smartphone use compared to substance-related disorders (Sharma et al., 2021). Whereas substance withdrawal is characterized by physiological distress, smartphone withdrawal is reflected in psychological discomfort, irritability, and restlessness when the device is unavailable (Kim et al., 2015). Such reactions, however, must be interpreted within the social and functional integration of smartphones into daily life, as being disconnected may trigger anxiety related to social obligations or concerns about lost data and security (Kala Negi and Singh, 2025). Here, alexithymia emerges as a key explanatory construct: individuals who have difficulties identifying internal emotional states may misinterpret this discomfort, perceiving the absence of the device as distress without recognizing the underlying anxiety or unmet emotional needs driving the reaction (Habibi Asgarabad et al., 2023) (Habibi Asgarabad et al., 2023).

This mechanism aligns with research linking alexithymia to maladaptive coping strategies and psychosomatic symptoms (Gatta et al., 2022). The reliance on smartphones to mask or externalize unrecognized emotional tensions suggests that PSU functions as a behavioral outlet for alexithymic individuals. Consequently, withdrawal-like behaviors in PSU may not signal an addictive disorder per se but rather reflect emotional dysregulation mediated by alexithymia (Di Carlo et al., 2024).

This interpretation complicates the classification of PSU, highlighting the importance of exploring whether the behaviors represent independent pathology or are secondary expressions of underlying affective difficulties.

The concept of loss of control further underscores the blurred line between normal reliance on technology and disordered use. Screening tools often capture sentiments such as **"I try to spend less time on smartphone, but the efforts were in vain"** (Zhang et al., 2023b), but the clinical relevance of such responses is questionable, particularly when use brings functional benefits such as academic efficiency or social connectedness (Billieux et al., 2015). From the perspective of alexithymia, this "loss of control" may arise less from a compulsive drive to use the device and more from an inability to identify and regulate the emotional triggers that perpetuate overuse.

Emotional states like boredom, loneliness, or frustration may remain vague or unrecognized by alexithymic individuals, who instead channel these undifferentiated emotions into smartphone engagement (Eastwood et al., 2007). As such, PSU may represent not only a behavioral pattern of dependence but also a maladaptive regulatory strategy that substitutes digital engagement for authentic emotional processing (Hemming et al., 2019).

Another critical dimension of PSU lies in its mediating pathways, particularly dopaminergic reward systems, social comparison, sleep disruption, and cognitive overload (Elhai et al., 2017). Excessive smartphone engagement overstimulates reward pathways, producing dopamine-driven reinforcement loops similar to those observed in substance dependence (Felix, 2025). Social media platforms amplify this mechanism by fostering social comparison and the fear of missing out

(FOMO), both of which have been directly associated with anxiety, depression, and dissatisfaction (Figure 2.1) (Reer et al., 2019). Sleep disruption, driven by blue-light exposure and late-night cognitive stimulation, exacerbates vulnerability to psychiatric symptoms such as insomnia, fatigue, and mood instability (Dedhia et al., 2024). Importantly, alexithymia intersects with these mediating factors by shaping how individuals perceive and respond to the cognitive-emotional challenges posed by smartphone use (Favieri, 2021). Those with alexithymia may be less able to cognitively reframe negative comparisons, less skilled at recognizing fatigue or sleep disruption as health risks, and more prone to stress from digital overstimulation due to reduced emotional clarity (Elhai et al., 2017). In this way, alexithymia amplifies the mediating processes that connect PSU to depression, anxiety, and suicidality, transforming what might otherwise be transient or situational problems into chronic vulnerabilities.

Finally, the stability and long-term consequences of PSU remain uncertain due to a lack of longitudinal research, raising questions about whether it should be conceptualized as a clinical disorder or a context-driven maladaptive behavior (Davison, 2001). Relapse, a core component of substance addictions, has yet to be studied systematically in PSU, while the possibility of spontaneous remission suggests that overuse may often resolve as life circumstances or coping mechanisms evolve (Turk and Okifuji, 2002).

This uncertainty underscores the importance of evaluating whether PSU is **"better explained by"** other psychological conditions such as insecure attachment, low impulse control, or alexithymia (Billieux et al., 2015). For instance, case studies indicate that smartphone overuse may dissipate when underlying emotional distress is addressed, suggesting that the addictive-like behaviors are secondary to deeper psychological constructs rather than standalone pathology.

In particular, alexithymia provides a compelling framework for understanding PSU as a compensatory behavior for unprocessed emotional states, situating smartphone overuse within a broader continuum of maladaptive coping strategies (Rozgonjuk, 2019). Therefore, integrating alexithymia into models of PSU not only refines diagnostic boundaries but also offers a pathway for targeted interventions

that focus on emotional awareness, regulation, and resilience rather than simply reducing screen time.

Problematic smartphone use (PSU) has been conceptualized as a behavioral addiction characterized by excessive, uncontrollable use leading to functional impairment (Elhai et al., 2021). Prevalence studies report alarmingly high rates: in a study of Sudanese medical students, 67.6% scored in the high smartphone addiction range (Amin et al., 2024). PSU was strongly correlated with poor sleep quality (r = .46), poor self-rated health (r = .53), and psychological distress (r = .36) (Amin et al., 2024).

Network analysis studies reveal that anxiety/craving symptoms of PSU act as core bridging symptoms linking PSU with sleep disturbances, highlighting the mechanism through which PSU disrupts restorative processes (Li et al., 2025a). Systematic reviews consistently show that PSU is negatively associated with quality of life, life satisfaction, and subjective well-being in children and adolescents (Kwon and Kim, 2022).

PSU has adverse effects on academic functioning, behavior, and health outcomes. Adolescents with higher PSU demonstrate lower school performance, more behavioral problems, and lower quality of life compared to those with low PSU (Kwon and Kim, 2022). Importantly, the severity of PSU symptoms — rather than mere screen time — appears to drive negative outcomes (Bianchi et al., 2023).

Mediation studies reveal that PSU exerts its effects partly via poor sleep. Among Bangladeshi university students, PSU predicted lower happiness and higher depressive symptoms, with sleep quality partially mediating these associations (Islam et al., 2025). Social anxiety also contributes: students with high social interaction anxiety engage in greater PSU, leading to increased depression, poorer sleep, and lower well-being (Qiu et al., 2025).

Recent scholarship continues to emphasize that smartphone addiction (SA) is a multidimensional behavioral phenomenon encompassing compulsive use, loss of control, salience, and functional impairment (Samaha & Hawi, 2023). A meta-analysis indicates that the global prevalence of problematic smartphone use (PSU)

among university students ranges between 25–35%, with higher rates observed in Asian countries where smartphone penetration and academic pressure are greatest (Tateno et al., 2022).

SA is now widely conceptualized as part of the spectrum of technological addictions, sharing core mechanisms such as reinforcement learning, dopaminergic reward pathways, and attentional capture (Montag et al., 2023). Neuroscientific studies report altered activation of the ventral striatum and prefrontal cortex in individuals with PSU, suggesting parallels with behavioral addictions such as gambling disorder (Horvath et al., 2022; Chóliz et al., 2021).

Longitudinal studies highlight a bidirectional feedback loop between PSU and emotional dysregulation: adolescents with higher baseline anxiety and stress show increased PSU over time, which subsequently worsens psychological distress (Li et al., 2023). The I-PACE model (Interaction of Person-Affect-Cognition-Execution) has been applied to explain this cycle, emphasizing that personal vulnerabilities (alexithymia, impulsivity) interact with affective states (loneliness, boredom) to drive compulsive smartphone engagement (Brand et al., 2022).

Sleep disruption is among the most robust mediators linking SA to mental health outcomes. A systematic review revealed that late-night screen exposure and pre-sleep arousal delay circadian rhythms and increase the risk for insomnia and cognitive decline (Xie et al., 2023). Importantly, these effects are independent of overall screen time, indicating that timing and emotional context of use are crucial predictors of harm.

Cognitive mechanisms such as social comparison and fear of missing out (FOMO) also contribute significantly to PSU. Passive browsing on social networking sites predicts depressive symptoms through upward social comparison, especially among individuals with low self-esteem (Verduyn et al., 2022). Collectivist cultural settings may further intensify this process, as social approval and belonging are valued more strongly than in individualist contexts (Yen et al., 2021).

Intervention research demonstrates that mindfulness-based digital detox programs can reduce PSU severity and improve mental health outcomes among university

students (Sari et al., 2023). Cognitive-behavioral interventions focusing on self-monitoring, stimulus control, and emotional regulation have been found to significantly lower compulsive smartphone use (Hadlington & Scase, 2022). Additionally, digital well-being tools—such as screen time reminders and focus modes—show small but measurable effects in reducing phone use, though their long-term effectiveness remains under study (Wilmer et al., 2022).

Gender differences are increasingly highlighted in SA research. In a large adolescent sample, girls reported significantly more emotional symptoms linked to smartphone overuse—such as anxiety and sadness—whereas boys' problematic use was more associated with gaming and risky behaviors like distracted driving (JMIR Pediatrics and Parenting, 2021). Another study found that stress predicted different subtypes of SA depending on gender: women were more likely to engage in compulsive social media use, whereas men showed higher addiction to mobile games and short video apps (Zhou et al., 2023).

Intervention and prevention research has expanded to explore how persuasive design features of smartphone apps (e.g., push notifications, infinite scroll, gamification) contribute to compulsive use. Users perceive these features as major triggers of overuse, reinforcing checking habits and distraction cycles (Ko et al., 2021). This has led to advocacy for ethical "digital design" that minimizes compulsive engagement.

Finally, SA has been linked to co-occurring psychological outcomes through latent profile and network analyses. Recent work has identified clusters of adolescents who show high levels of smartphone addiction along with depression, sleep deprivation, and loneliness, indicating that SA may function as part of a broader psychosocial vulnerability profile rather than as an isolated condition (Liu et al., 2025).

In the Pakistani context, where smartphone ownership among youth aged 18–25 exceeds 65% and females face greater sociocultural constraints on public interaction (Pakistan Telecommunication Authority, 2025; UNDP Pakistan, 2024), gender may uniquely moderate the alexithymia–SA–SWB pathway. Women, often

socialized toward emotional restraint and limited physical mobility, may increasingly rely on smartphones for social connection and self-expression, potentially transforming alexithymic tendencies into compulsive digital engagement that disrupts sleep, academic focus, and family harmony—key pillars of well-being in collectivist settings (Rizvi and Hussain, 2023).

2.2.2.1 Smartphone Addiction as a Behavioral Problem

Smartphone addiction is increasingly conceptualized as a behavioral addiction, resembling substance-based addictions in its components and consequences. Unlike mere overuse, the behavioral addiction framework emphasizes compulsivity, loss of control, tolerance, withdrawal, conflict, and mood modification (Sayma, Shahnawaz, & Griffiths, 2019).

In a qualitative study using the components model of addiction among college students, for example, addicted participants differed substantially from non-addicted ones on salience, tolerance, withdrawal, and conflict domains, although mood modification and relapse were less distinct (Sayma, Shahnawaz, & Griffiths, 2019).

The behavioral perspective is useful for understanding how certain features of smartphone apps and devices facilitate addictive behavior. Persuasive design elements—such as notifications, auto-play, infinite scroll, reward feedback loops—are often built into apps. A mixed-methods study of Chinese university students (N = 183 survey + interviews) found that about 25% reported having multiple problematic smartphone-use behaviors, and many participants said that these persuasive designs prolonged usage, reinforced frequent checking of the phone, and led to distraction (Chen, Hedman, Distler, & Koenig, 2021). These app design features operate as external triggers that interact with internal vulnerabilities to produce behavioral patterns characteristic of addiction.

Behavioral problems linked with smartphone addiction often co-occur with mental health issues. In undergraduates, smartphone addiction is strongly correlated with depression, anxiety, stress, loneliness, and low life satisfaction. A recent

network analysis (N = 701) showed that depression and anxiety had high centrality in relation to smartphone addiction; moreover, behavioral activation systems (such as reward responsiveness, fun seeking) and behavioral inhibition systems are strongly associated with smartphone addiction, indicating that deficits in self-regulation (both approach and avoidance systems) are core to the behavioural problem (Zheng et al., 2025).

Another important behavioral facet is the overlap between smartphone addiction and other addictive behaviors or problematic usage, such as online gaming. A study among individuals with ketamine use disorder (N = 233) found that those at risk for problematic smartphone use reported higher ADHD symptoms and greater likelihood of using smartphones for online gaming than those at lower risk, with daily smartphone usage time also significantly increased among the risk group (Lin et al., 2025). This suggests that smartphone addiction does not arise in isolation but may be interwoven with other addictive or compulsive behaviors.

Personality traits and sleep behavior also play into the behavioral addiction profile of smartphone addiction. A study with 422 university students found that higher novelty seeking and impulsivity traits predicted higher scores on a smartphone addiction measure (SPAI). Those with stronger addiction symptoms also reported worse sleep disturbance (higher Pittsburgh Sleep Quality Index scores), especially in relation to withdrawal symptoms and anticipatory worry (Luo, Liu, & Ye, 2021). Poor sleep then becomes both a consequence and an enabler of more problematic behavior.

From the behavioral standpoint, measuring actual behavior (not just self- perceptions) is crucial but underutilized. A scoping review of 1,305 smartphone addiction studies revealed that nearly half (≈49.9%) did not report any smartphone-specific behaviors (e.g., hours of use, number of pickups). Among those that did, most relied on self-report; only 10% used logged data or objective measures (minutes used, app launch counts, etc.) (Rozgonjuk, Saal, & Billieux, 2023). This gap suggests that much of what is labeled "smartphone addiction" may depend heavily on subjective report, which tends to exaggerate or mis-estimate usage and behavioral problems.

Behavioral consequences of smartphone addiction extend into life functioning and academic performance. Problematic smartphone use (PSU) has been linked with lower grade point averages, poorer concentration, and more frequent multitasking, which leads to decreased productivity and greater academic stress (Grant, Lust, & Chamberlain, 2019). In their large-scale student survey, Grant et al. (2019) found that about 20% of participants reported problematic smartphone use, which correlated with impulsivity, ADHD symptoms, and also with risky behaviors such as substance use and poorer academic outcomes.

Another study among postgraduate students in an Arabic sample (N = 506) found that 51% met criteria for smartphone addiction; this group also had significantly greater odds of depression, ADHD symptoms, insomnia, and nicotine dependence compared to non-addicted peers (Al-Mahmoud et al., 2021). The study reports that smartphone addicts had about twice the odds of insomnia and showed elevated ADHD symptoms. These findings underscore that behavioral addiction to smartphones tends to co-occur with other addictive or compulsive tendencies, both behavioral and mental.

Athletes are not immune: among a sample of athletes, smartphone addiction was significantly associated with risk factors including psychological distress, reduced self-regulation, and poorer sleep hygiene (Sahin Koybulan, Altin, Yararbas, & Hassoy, 2024). In such populations, smartphone addiction may impair rest, performance, and recovery, pointing to concrete behavioral detriments beyond psychological effects. Behavioral addiction models also help explain relapse, craving, and tolerance in smartphone use. Users often report escalating use (tolerance), difficulty controlling use (loss of control), disruptions in social and daily activities (conflict), and anxiety or distress when unable to use their smartphone (withdrawal) (Sayma, Shahnawaz, & Griffiths, 2019). These features mirror substance addiction criteria and support seeing smartphone addiction as a serious behavioral problem.

Intervention-oriented behavioral studies are emerging. For instance, personalized and context-aware interventions that account for mental state, habitual behavior, and physical context (e.g., being bored, stressed, etc.) show promise. The

"MindShift" intervention using large language models (LLMs) adjusted persuasion strategies dynamically based on users' states and reduced smartphone use duration and addiction scale scores over a 5-week field experiment (Wu, Pan, Liu, et al., 2023). Such interventions suggest that addressing the behavioral component (app-driven triggers, daily habits) can reduce addiction severity.

Some future directions indicated by behaviorally-oriented research include increasing use of objective measurement (phone logs, usage tracking), deeper longitudinal designs to clarify causality, distinguishing subtypes of smartphone addiction (e.g., social-media vs gaming vs short-video dominated), and exploring moderating variables such as personality, self-regulation, and environmental/contextual factors.

Smartphone addiction is best understood using the components model of addiction (salience, mood modification, tolerance, withdrawal, conflict, relapse), which highlights how routine device use can develop into compulsive, functionally impairing behaviour when those components become dominant in daily life (Sayma et al., 2019). This model helps differentiate high but functional phone use from clinically relevant problematic use that resembles behavioural addictions.

2.2.3 Subjective Well Being

Subjective well-being (SWB), as defined by the World Health Organization (Vik and Carlquist, 2018), reflects an individual's appraisal of their culture, values, aspirations, and overall existence. It encompasses multiple dimensions such as vitality, happiness, and perceived happiness (Diener et al., 2021). Importantly, SWB should not be regarded merely as an outcome but as a central psychological construct shaped by emotional vulnerabilities and maladaptive coping strategies. Individuals with difficulties in emotional processing—particularly those high in alexithymia—may increasingly turn to smartphones as a means of temporary emotional relief, engaging in digital escapism to mitigate distress (Elhai et al., 2017). However, sustained reliance on such behaviors can escalate into smartphone addiction, undermining emotional regulation, interpersonal functioning, and ultimately diminishing subjective well-being (Goel and Singla, 2025).

Within the Pakistani sociocultural context, where smartphone penetration is rapidly expanding, these psychological dynamics are becoming especially significant. While smartphones facilitate communication and access to knowledge, excessive use is associated with growing concerns about deteriorating mental health, particularly among university students (Ahmed et al., 2023). Social norms that restrict emotional expression, coupled with intense academic and societal pressures, may height en emotional dysregulation and reinforce alexithymic tendencies, thereby fostering dependence on smartphones as an emotional coping mechanism (Yılmazer, 2024).

Despite the urgency of these issues, empirical studies exploring the pathways linking alexithymia, smartphone addiction, and subjective well-being remain limited in Pakistan. Given that young adults are a particularly vulnerable group exposed to heightened digital interaction and mental health challenges (El Asam and Katz, 2018), examining these relationships is critical. Addressing this gap may provide essential insights for developing culturally informed interventions to enhance emotional well-being and encourage healthier digital practices among youth (Laffier et al., 2025).

Subjective well-being (SWB) comprises a cognitive component (life satisfaction) and affective components (positive affect and low negative affect) (Diener et al., 2018). Seligman (2018) PERMA model expands this by incorporating engagement, relationships, meaning, and accomplishment as additional dimensions of flourishing.

Emotional competence is a key predictor of SWB: individuals who can accurately identify, understand, and regulate emotions report higher life satisfaction and lower negative affect (Brasseur et al., 2023). Conversely, alexithymia is negatively associated with SWB across populations, as emotional unawareness limits positive emotional experiences and social connection (Taylor and Bagby, 2021).

PSU consistently predicts lower SWB. Adolescents with high smartphone addiction report greater loneliness, more depressive symptoms, and reduced happiness

(Elhai et al., 2021). During COVID-19 lockdowns, PSU predicted lower well-being even after controlling for stress and family functioning (Zhao et al., 2023). However, not all smartphone use is harmful: active, socially connected use may enhance well-being, whereas passive, compulsive checking behaviors are detrimental (Verduyn et al., 2022).

In Pakistan, over 60% of young adults (18–25) own smartphones with 4.5-hour daily use amid rising mental health issues (Pakistan Telecommunication Authority, 2025; Gallup Pakistan, 2024). Alexithymia may worsen PSU's impact on SWB by driving escapist digital behaviors under cultural norms of emotional restraint and familial duty, disrupting sleep, academics, and relational bonds in a collectivist society (Hussain and Qadir, 2023).

2.2.4 Psychological Dimensions of Alexithymia and Smartphone Addiction

Smartphone addiction (SA) has been increasingly recognized as a behavioral concern that adversely affects individuals' daily functioning, psychological health, and social relationships, characterized by excessive, uncontrolled, and compulsive smartphone use (Kuss and Griffiths, 2017). The World Health Organization (WHO) has emphasized that prolonged daily smartphone use, particularly more than 4–6 hours, may trigger problematic or addictive patterns. While SA has been associated with depression, anxiety, stress, loneliness, and social withdrawal (Elhai et al., 2020; Wacks and Weinstein, 2021), recent literature emphasizes that emotional deficits—particularly alexithymia—play a significant predictive role in the development of addictive smartphone behaviors. Alexithymia, defined as difficulty in identifying, understanding, and expressing emotions, predisposes individuals to maladaptive coping strategies, including overreliance on digital technologies to regulate internal distress (Huang et al., 2022; Gori and Topino, 2024). Individuals who struggle to process emotional experiences may turn to smartphones for distraction, escape, or emotional relief, which aligns with the Compensatory Internet Use Theory (Kardefelt-Winther, 2014) and suggests that SA is not merely a behavioral habit but a dysfunctional emotional coping mechanism. In Pakistan,

cultural norms of emotional restraint may intensify alexithymia-driven SA as a hidden coping mechanism (Khan and Ahmed, 2023).

Empirical evidence supports this directional relationship—alexithymia has been found to significantly predict higher levels of smartphone addiction among university students and adolescents (Helmy et al., 2024; Panayiotou et al., 2024). For example, Remondi et al. (2020) reported that emotionally unaware individuals exhibited greater dependence on smartphones to avoid emotional discomfort. Similarly, Hao and Jin (2020) found that participants with higher alexithymia scores used smartphones excessively to manage unresolved emotions, reinforcing addictive use over time. In a meta-analysis, Huang et al. (2022) confirmed that alexithymia has a moderate, positive effect on problematic smartphone use, with difficulty identifying feelings (DIF) being the strongest predictor. Furthermore, studies in Middle Eastern and Asian university populations have shown that alexithymia explained significant variance in smartphone addiction even after controlling for depression and anxiety (Islam et al., 2025; Kim and Koh, 2023).

Smartphone addiction has also been associated with decreased subjective well-being (SWB), lower life satisfaction, and increased emotional exhaustion (Lee and Lee, 2023; Goel and Singla, 2025). Excessive smartphone use as an emotion-avoidance strategy may offer short-term relief but ultimately disrupts emotional regulation, interpersonal connectedness, and psychological resilience (Panayiotou et al., 2024). Therefore, consistent with the objectives and hypotheses of this study, alexithymia is conceptualized as an emotional vulnerability factor that leads to smartphone addiction, which in turn contributes to reduced subjective well-being among university students. Together, these findings emphasize the intertwined roles of emotional dysregulation, alexithymia, and SA in deteriorating psychological and social functioning.

2.3 Theoretical Framework

This study is grounded in Compensatory Internet Use Theory (CIUT), developed by Kardefelt-Winther (2014), which explains that excessive internet or smartphone use is not necessarily driven by attraction to the technology itself, but by the

need to cope with underlying emotional and psychological difficulties. Rather than viewing smartphone addiction as a purely behavioral issue, CIUT frames it as a compensatory coping mechanism for unmet psychological needs or internal distress.

2.3.1 Alexithymia as Emotional Distress (Person-level Factor)

In this framework, person-level factors refer to the internal psychological traits or emotional characteristics that shape how individuals experience and cope with life stressors. In the current study, alexithymia serves as the key person-level factor. It is defined as a trait characterized by difficulty in identifying and describing emotions, limited emotional insight, and a tendency to focus on external events rather than inner emotional states (Taylor et al., 1997).

Individuals with alexithymia often experience chronic emotional confusion, frustration, or distress because they cannot effectively process or articulate their internal states (Goodwin et al., 2004). As per CIUT, this distress prompts the search for external relief mechanisms (Diener et al., 2021). Because these individuals lack effective internal regulation, they are more likely to adopt maladaptive external coping behaviors — such as excessive smartphone use — to avoid confronting emotional discomfort.

2.3.2 Smartphone Use as a Compensatory Behavior (Behavioral Mechanism)

CIUT suggests that when individuals face psychological distress, they may engage in compensatory behaviors to alleviate their discomfort. In this study, the key behavioral mechanism is smartphone addiction — the excessive, uncontrolled use of smartphones to escape, distract, or soothe emotional discomfort.This maladaptive coping strategy gradually reinforces reliant on their devices for emotional regulation. For alexithymic individuals, smartphones serve as an emotionally safe and

instantly accessible outlet. Research shows that such individuals may use smartphones to avoid processing distressing emotions, distract from internal discomfort and feel temporarily soothed or engaged (Elhai et al., 2017).

Although this behavior may offer short-term relief, over time it reinforces avoidance-based coping, reduces opportunities for emotional growth, and fosters psychological dependency (Rozgonjuk, 2019). As the behavior intensifies, it develops into smartphone addiction, which includes symptoms like withdrawal, tolerance, and functional impairment (Kala Negi and Singh, 2025).

2.3.3 Subjective Well-Being as the Consequence

Although smartphone use provides temporary relief, it eventually leads to social withdrawal and isolation, decreased real-life engagement, decline in overall happiness and wellbeing (Figure 2.3), all of which negatively affect subjective well being (Rozgonjuk, 2019; Kala Negi and Singh, 2025). Emotional avoidance through digital escape interferes with the ability to build meaningful relationships or achieve emotional balance — reducing happiness (Elhai et al., 2017). Therefore, CIUT provides a comprehensive framework that explains how emotional vulnerability (alexithymia) leads to maladaptive coping (smartphone addiction) which results in poor psychological outcomes (lower subjective well-being).

This theory is particularly relevant for university students, who are in a developmental stage marked by identity formation, emotional instability, and reliance on technology (Alavi et al., 2020; Elhai et al., 2017). Their incomplete emotional development makes them especially vulnerable to the compensatory behavioral patterns predicted by CIUT.

2.4 Conceptual Framework

The present study is based on Compensatory Internet Use Theory (CIUT) proposed by Kardefelt-Winther (2014), which explains that individuals often engage in excessive internet or smartphone use as a way to cope with psychological difficulties or emotional distress. This behavior functions as a compensatory strategy to temporarily relieve internal discomfort. In this framework, alexithymia—difficulty

identifying, describing, and processing emotions (Taylor et al., 1997)—is conceptualized as the primary emotional vulnerability. Individuals high in alexithymia are more likely to experience internal distress due to their inability to understand or express emotions. According to CIUT, such unresolved emotional strain can lead individuals to seek relief through maladaptive digital behaviors, such as excessive smartphone use (Elhai et al., 2017).

Smartphone addiction, in this context, represents a behavioral coping response—a way to escape or avoid dealing with internal emotions (Rozgonjuk, 2019). While this coping mechanism may offer short-term distraction, over time it may result in dependency and disrupt emotional, social, and cognitive functioning. Consequently, this overreliance on smartphones is hypothesized to negatively impact subjective well-being, which includes aspects such as happiness, and psychological health (Kuss and Griffiths, 2017; Barbera and Rizzo, 2025).

This linear framework focuses on two core relationships (Figure 2.3):

- Alexithymia is expected to show a significant positive association with smartphone addiction.
- Smartphone addiction is expected to have a significant negative relationship with subjective well-being.

Both pathways highlight the role of alexithymia as an emotional vulnerability contributing to excessive smartphone use, and the subsequent impact of smartphone addiction on students' overall well-being.

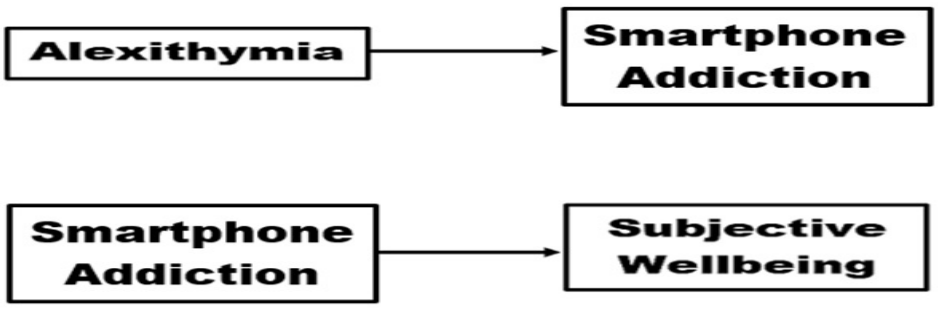

FIGURE 2.1: Conceptual Framework of Alexithymia a Determinant of Smartphone

The research objectives directly reflect the conceptual framework grounded in Compensatory Internet Use Theory (CIUT). This theory suggests that individuals engage in excessive smartphone use as a way to cope with unresolved emotional Distress and how this excessive use impacts subjective well-being, including happiness. Both the framework and objectives emphasize the role of smartphone use as a compensatory coping strategy, which may ultimately contribute to reduced emotional health and overall well-being in young adults.

2.5 Rationale

In recent years, smartphone usage in Pakistan has grown rapidly due to increased accessibility, affordability of mobile technology, and widespread internet penetration. By 2023, approximately 59% of the population used smartphones, with a significant portion of users being young adults and university students (Pakistan Telecommunication Authority, 2023). While smartphones serve as essential tools for communication, education, and entertainment, they have also introduced new psychological challenges. Studies in the local context reveal that a growing number of young adults exhibit signs of problematic smartphone use, including compulsive checking, withdrawal symptoms, and disruptions to daily routines (Ahmed et al., 2023). At the same time, emotional regulation difficulties such as alexithymia—defined as difficulty identifying and expressing emotions—are becoming increasingly prevalent, with nearly 27% of university students reporting related symptoms (Karim and Chaudhry, 2021). This emotional dysregulation, combined with excessive reliance on digital devices, may be contributing to the observed decline in subjective well-being, including elevated stress levels and life dissatisfaction (Ibrahim, 2021).

Despite growing concern, empirical research in Pakistan remains limited, especially studies that explore the associated psychological mechanisms underlying smartphone addiction. The majority of existing studies have focused on descriptive or correlational analyses, and have largely been conducted in Western or East Asian contexts, overlooking the sociocultural dynamics unique to South Asian populations (Horwood and Anglim, 2022; Lee and Lee, 2023). Moreover, there is a

lack of theoretical integration that simultaneously addresses emotional vulnerability (alexithymia), behavioral coping mechanisms (smartphone addiction), and psychological outcomes (subjective well-being) within a unified framework. While past studies have employed theories such as Attachment Theory to explain smartphone addiction (Sharma and Mishra, 2021), such models often fail to account for the functional behavioral mechanisms that drive individuals to use smartphones as a means of emotional compensation. To address this gap, the present study adopts the Compensatory Internet Use Theory (CIUT) (Kardefelt-Winther, 2014), which posits that individuals may engage in problematic digital behaviors as a strategy to cope with internal emotional distress. Within this framework, alexithymia is conceptualized as the emotional vulnerability that prompts excessive smartphone use as a form of digital escape, which over time contributes to a decline in subjective well-being.

By applying CIUT to a Pakistani university student population, this study aims to fill key theoretical and contextual gaps in the literature (Jamali and Chandio, 2023). It not only emphasizes the associated pathways between emotional regulation difficulties and psychological outcomes, but also provides a culturally relevant understanding of how emotional distress and compensatory technology use interact in shaping young adults' mental health (Weiss et al., 2022).

It is anticipated that the findings of this study will make a meaningful contribution to both social and clinical psychology, particularly in the domains of emotional regulation, behavioral addiction, and mental health promotion (Castro and Neto, 2025). By examining how alexithymia functions as an emotional vulnerability that predicts smartphone addiction, and how this behavior subsequently impacts subjective well-being, the study offers a comprehensive understanding of the psychological mechanisms linking emotional dysregulation and maladaptive technology use (Varchetta, 2025). These insights are especially valuable in identifying the risk factors associated with excessive smartphone dependence among young adults.

The primary beneficiaries of this research are university students and emerging adults, who represent the age group most vulnerable to the psychological consequences of problematic smartphone use (Ahmed et al., 2023). Furthermore, the findings will be beneficial for mental health professionals and educators, as they

provide evidence-based direction for designing preventive and therapeutic interventions. Such interventions may focus on enhancing emotional awareness, reducing reliance on digital coping mechanisms, and ultimately improving happiness, metal state, and psychological well-being among youth in the Pakistani context (Karim and Chaudhry, 2021).

Chapter 3

Research Methodology

3.1 Research Design

This study utilized a correlational research design to investigate the relationships between alexithymia, smartphone addiction, and subjective well-being. It focused on examining how alexithymia contributes to the development of smartphone addiction as a compensatory coping mechanism and how this addictive behavior subsequently influences the subjective well-being of university students. To evaluate these associations, linear regression analysis was conducted, providing a statistical measure of the predictive strength among the variables. More specifically, the analysis assessed the predictive role of alexithymia in smartphone addiction and identified the extent to which smartphone addiction accounted for variations in subjective well-being.

3.2 Analysis Scales Selection

3.2.1 Smartphone addiction Scale Short Version

The Smartphone Addiction Scale – Short Version (SAS-SV), proposed by Kwon et al. (2013), serves as a brief yet reliable instrument for assessing smartphone addiction. It is a modified form of the original Smartphone Addiction Scale (SAS), which was initially developed by same authors. The short version was designed

to provide a quick and accurate evaluation of problematic smartphone use, particularly among young people and university students. Comprising 10 items, the SAS-SV measures levels of smartphone addiction using a 6-point Likert scale ranging from "Strongly agree" to "Strongly disagree." In this study, the average score on the 10 items was 3.52 ± 0.99, and the scale demonstrated good internal consistency ($\alpha = .85$).

3.2.2 Subjective Happiness Scale

The Subjective Happiness Scale (SHS), developed by Lyubomirsky and Lepper (1999), is a short 4-item self-report tool widely utilized to measure overall subjective well-being. Responses are recorded on a 7-point Likert scale, ranging from 1 (not at all) to 7 (a great deal). Two of the items assess individuals' self-perceptions of happiness, while the other two require comparisons with others or agreement with descriptions of happy versus unhappy individuals. The SHS has been found to exhibit strong internal consistency (Cronbach's α between 0.80 and 0.83) as well as acceptable test–retest reliability ($r \approx 0.70$).

3.2.3 Toronto Alexithymia Scale

The Toronto Alexithymia Scale-20 (TAS-20), developed by Bagby et al. (1994), conceptualizes alexithymia as a multidimensional construct comprising three subscales: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). The first subscale, **Difficulty Identifying Feelings (DIF)**, consists of seven items (e.g., Items 1, 3, 6, 7, 9, 13, and 14) and assesses an individual's inability to recognize, distinguish, and interpret emotions and the bodily sensations associated with emotional arousal. Individuals scoring high in DIF often confuse physical sensations with emotional states and experience emotional awareness deficits. This subscale has demonstrated strong internal reliability, with Cronbach's alpha typically ranging between 0.78 and 0.86 in both clinical and non-clinical populations (Bagby et al., 1994; Gori, 2024; Preece et al., 2017). In cultural contexts emphasizing emotional restraint, may further drive reliance on external stimuli smartphones for mood regulation.

The second dimension, **Difficulty Describing Feelings (DDF)**, includes five items (Items 2, 4*, 11, 12, and 17). This subscale evaluates an individual's difficulty in verbally expressing emotions and communicating emotional states to others. Individuals with high DDF scores often experience emotional suppression, interpersonal misunderstanding, and resistance to emotional disclosure. The subscale shows satisfactory reliability, with Cronbach's alpha values typically between **0.73 and 0.81** (Bagby et al., 1994; Taylor and Bagby, 2021). Due to its link with inhibited emotional expression and help-seeking avoidance, DDF has been identified as a predictor of maladaptive behaviors such as digital dependence and avoidance-based coping.

The third subscale, **Externally Oriented Thinking (EOT)**, consists of eight items (Items 5*, 8, 10*, 15, 16, 18*, 19*, and 20). EOT reflects a cognitive thinking style focused on external events and practical details rather than introspection, emotional awareness, or imaginative thinking. Individuals high in EOT tend to prioritize logic, routine, and observable facts over internal emotional processes, which may contribute to emotional detachment and reduced empathic abilities. EOT has internal consistency with Cronbach's alpha values ranging from **0.60 to 0.70**, it remains a reliable component, especially when used within the full TAS-20 scale (Bagby et al., 1994; Karukivi and Saarijärvi, 2014; Zhang et al., 2024). Overall, the TAS-20 demonstrates strong psychometric validity across cultures, with the total scale reporting Cronbach's alpha values between **0.80 and 0.87**, making it one of the most widely accepted tools for measuring alexithymia globally. Its comprehensive framework enables a nuanced understanding of individual differences in emotional awareness and expression.

The scale comprises 20 items in total that evaluate an individual's capacity to recognize and communicate emotions. Each item is rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The total alexithymia score is obtained by summing responses to all 20 items, while separate subscale scores are derived from grouped items. Scores between 52 and 60 suggest a possible presence of alexithymia. Higher scores may reflect greater emotional suppression common in collectivist cultures.

3.3 Sample Selection

The sample chosen for this study were students enrolled in undergraduate and postgraduate programs because scientific studies have shown that they were more involved in using smartphones (Nguyen et al., 2025). People in universities use mobile phones excessively and on a daily basis, as it is the time of emotional, physical, and psychological turmoil which aggravated their sensitivity to many situations and experiences.

The sample size consisted of 295 university students aged 18–30 years who used their smartphones for more than 4–6 hours, determined based on precedent established in prior empirical research examining the relationships among alexithymia, smartphone addiction, and subjective well-being. Several studies conducted with similar research objectives have used sample sizes ranging between 200 and 350 participants, which have been considered sufficient for correlational and regression-based analyses (Huang et al., 2022; Panayiotou et al., 2024; Helmy et al., 2024). For instance, Huang et al. (2022) analyzed data from 284 university students to explore the association between alexithymia and problematic smartphone use, while Helmy et al. (2024) investigated alexithymia and smartphone addiction among 312 undergraduate students. Similarly, Panayiotou et al. (2024) utilized a sample of 302 students to examine emotional regulation, alexithymia, and smartphone dependency.

Following this established methodological pattern and to ensure comparability of findings with existing literature, the current study recruited **295 participants**, which lies within the sample range commonly used in similar research. This sample size is also adequate for detecting small-to-medium effect sizes in correlation and regression analyses, ensuring both statistical reliability and external validity of the findings.

In the Pakistani university context, where academic pressure, social expectations, and limited mental health resources converge, this age group faces heightened emotional challenges that may amplify reliance on smartphones as a primary coping tool.

3.4 Sampling Procedure

In this study, convenience sampling was used to obtain data from students attending public and private universities in Islamabad and Rawalpindi. As a non-probability sampling technique, convenience sampling involves recruiting participants who are readily accessible and willing to take part (Etikan et al., 2016). This approach was considered appropriate due to time and resource limitations, enabling efficient collection of information from the intended student population.

3.5 Data Collection Procedure

Data for this study were gathered online using Google Forms after obtaining informed consent from all participants. Students were clearly briefed on the study's objectives, scope, and potential benefits, and they were given precise instructions prior to completing the survey. Consistent with the APA's Ethical Principles of Psychologists and Code of Conduct (Standard 8.02), electronic informed consent is acceptable when participation is voluntary, confidentiality is protected, and participants are fully informed of their rights (Fisher and Vacanti-Shova, 2012). To ensure ethical standards, respondents were assured that their answers would remain confidential, used solely for academic research, and that their privacy and safety would be maintained throughout the process. They were also reminded of their right to withdraw at any point without any negative consequences and were encouraged to raise questions for clarification if needed. Online surveys are widely acknowledged in academic research as a valid and ethical means of collecting data when appropriate protections are in place (Eastwood et al., 2007). The contributions and cooperation of participants in this study were sincerely valued and acknowledged.

3.6 Data Collection

Data for this study were obtained exclusively through an online survey distributed to students across multiple universities in Rawalpindi and Islamabad. An informed

consent statement was included at the beginning of the survey to ensure participants understood the academic purpose of the research and their right to withdraw at any time. Respondents were provided with clear instructions to read each item carefully and select the response option that best reflected their views.

The survey incorporated three standardized questionnaires, which on average required 10–15 minutes to complete. All responses were submitted electronically, ensuring both confidentiality and ease of participation. At the conclusion of the survey, participants were thanked for their cooperation and valuable input.

3.6.1 Inclusion Criteria

- Students enrolled in undergraduate (BS level) and postgraduate programs.
- Age range: 18–30 years, as this group is highly vulnerable to excessive smartphone use and related psychological impacts.
- Daily smartphone usage of more than 4–6 hours, to ensure inclusion of individuals at greater risk of problematic use (Zhang et al., 2025).
- Both male and female students were eligible to capture diverse perspectives across genders.

3.6.2 Exclusion Criteria

- Participants who reported less than 4 hours of daily smartphone usage were considered below the threshold for problematic smartphone behavior (Zhang et al., 2025).
- This criterion was set based on prior research, which identifies ¿4 hours daily use as a standard benchmark for potential risk of smartphone addiction.
- However, in this study no data were excluded; all responses (N = 309) were retained for analysis.

3.7 Results Interpretation

The collected data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS). Data screening was performed to check for missing values, outliers, and normality assumptions. Descriptive statistics, including means, standard deviations, and frequencies, were generated to provide an overview of the sample characteristics and the distribution of study variables.

Inferential statistics were employed to test the study hypotheses. Pearson's correlation analysis was used to examine the relationship between alexithymia, smartphone addiction, and subjective well-being. Furthermore, linear regression was conducted to assess the associated power of alexithymia on smartphone addiction and to evaluate how smartphone addiction, in turn, predicted subjective well-being (Hatami Nejad et al., 2025) (Hatami Nejad et al., 2025). Regression analysis is widely used in psychological and social science research to determine the extent to which independent variables explain outcomes in dependent variables (Singha, 2025). The findings were interpreted in light of the theoretical framework, Compensatory Internet Use Theory (CIUT), and previous empirical studies, allowing for a comprehensive understanding of the associated relationships among the study variables.

3.8 Ethical Considerations

This study placed the highest priority on safeguarding the rights, privacy, and overall well-being of all participants. Participation was completely voluntary, and informed consent was obtained from every student after they were fully briefed on the purpose, objectives, and potential benefits of the research. Clear guidelines were provided to ensure participants understood their role, and they were assured that all responses would remain confidential and be used strictly for academic purposes. Anonymity was maintained throughout the process, with no identifying information collected or disclosed at any point.

Students were reminded of their right to ask questions, seek clarification, and withdraw from the study at any stage without facing any adverse consequences. The

researcher ensured that ethical standards of respect, transparency, and participant safety were followed rigorously during the entire data collection process. To further uphold ethical integrity, measures were also taken to minimize any psychological discomfort and to create a stress-free environment for participation.

Finally, genuine appreciation was expressed to all the students who contributed their time and insights, as their cooperation was instrumental in the successful completion of this research. Their participation not only strengthened the study's findings but also highlighted the importance of collective academic engagement in addressing issues of smartphone addiction, alexithymia, and subjective well-being. The contributions of these participants will continue to serve as a valuable foundation for future research and interventions in this area.

Chapter 4

Results

4.1 Demographic Characteristics

A total of 295 participants completed the study. The age of respondents ranged from below 20 to 60 years, with the majority belonging to the 21–25 years age group (73.1%). Most participants were female (60.8%), while 39.2% were male.

In terms of education, 51.1% were undergraduate students, 40.8% were graduates, 7.4% were enrolled in M.Phil. programs, and 0.3% were pursuing doctoral studies. Regarding marital status, the majority of participants were single (81.6%), while 18.1% were married. When asked about mental health history, 23.3% of participants reported having a history of mental health issues, whereas 76.7% reported no such history. Concerning smartphone usage, 89.3% of participants reported using their smartphone for more than four hours daily, while 10.7% reported using it less than four hours daily.

These demographic findings highlight that the sample primarily consisted of young, educated, and single individuals who engage in extensive smartphone use. The predominance of university students suggests that the study population represents a group particularly vulnerable to problematic smartphone behaviors due to academic stress, social media engagement, and digital communication demands. The high proportion of female participants and those without prior mental health issues provides a useful context for interpreting the relationship between emotional dysregulation, alexithymia, and smartphone addiction within this demographic.

TABLE 4.1: Demographic Analysis of Participants

Variable	**Category**	**n**	**%**
Gender	Male	116	39.2
	Female	179	60.8
Age (years)	18–20	26	8.7
	21–25	216	73.1
	26–30	41	13.9
Education	Undergraduate	151	51.1
	Graduate	120	40.8
	M.Phil	22	7.4
	Ph.D.	1	0.3
Marital Status	Single	241	81.6
	Married	53	18.1
Mental Health Issues	Yes	69	23.3
	No	226	76.7
Smartphone Usage (>4 h daily)	Yes	295	100

4.2 Descriptive Statistics

Descriptive statistics were computed to summarize the central tendency, variability, and distribution of the scores for the study variables. The analysis focused particularly on Smartphone Addiction, as it represents the primary behavioral construct of interest. The results revealed that the mean score for smartphone addiction was M = 3.91 (SD = 1.15), which indicates a moderate level of smartphone addiction among the participants. This aligns with the inclusion criteria of the study, where all respondents reported using their smartphones for more than four hours daily.

The median value (Mdn = 3.80) and the 5% trimmed mean (3.92) were closely aligned with the overall mean, indicating a symmetrical distribution of responses and the absence of significant outliers. The 95% confidence interval (3.78–4.04) demonstrates that the true population mean is likely to fall within this narrow range, reflecting precision and stability in the mean score estimation.

The variance (1.32) and standard deviation (1.15) suggest moderate dispersion, meaning that while participants differed in their smartphone usage intensity, most scores clustered around the mean. The minimum (1.10) and maximum (6.00) scores demonstrate variability across the sample, representing both low and high addiction tendencies. Furthermore, the interquartile range (IQR = 1.50) indicates that 50% of participants' scores fell within a narrow interval, reinforcing the homogeneity of responses.

and high addiction tendencies. Furthermore, the interquartile range (IQR = 1.50) indicates that 50% of participants' scores fell within a narrow interval, reinforcing the homogeneity of responses.

Table 4.2: Descriptive Statistics for Smartphone Addiction

Statistic	**Value**	**Std. Error**
Mean	3.91	0.07
95% Confidence Interval for Mean	3.78 – 4.04	–
5% Trimmed Mean	3.92	–
Median	3.80	–
Variance	1.32	–
Standard Deviation	1.15	–
Minimum	1.10	–
Maximum	6.00	–
Range	4.90	–
Interquartile Range	1.50	–
Skewness	0.11	0.14
Kurtosis	-0.50	0.28

Note. $N = 295$. Values represent descriptive statistics for the variable "Smartphone Addiction."

4.3 Reliability Statistics

The reliability of the measurement instruments used in this study was assessed through Cronbach's alpha analysis. The overall Cronbach's alpha coefficient for the applied scales, the Smartphone Addiction Scale-Short Version (SAS-SV), the Subjective Happiness Scale (SHS), and the Toronto Alexithymia Scale (TAS-20), was calculated as 0.84.

In psychometric research, Cronbach's alpha values of 0.70 or higher are typically regarded as acceptable, with values above 0.80 reflecting strong reliability. Therefore, the obtained coefficient of 0.84 confirms that the instruments demonstrated a high level of internal consistency. This indicates that the items within each scale reliably measured their intended constructs, smartphone addiction, subjective well-being, and alexithymia. Moreover, the strong inter-item correlations further support that the items consistently captured the underlying dimensions, thereby reinforcing the credibility and dependability of the analyses conducted in this study.

The overall alexithymia scale demonstrated good internal consistency ($\alpha = .84$), with the Difficulty Identifying Feelings (DIF) subscale showing excellent reliability ($\alpha = .90$). In contrast, the Difficulty Describing Feelings (DDF) ($\alpha = .48$) and Externally Oriented Thinking (EOT) ($\alpha = .46$) subscales indicated relatively low internal consistency, suggesting limited homogeneity among their items.

The Smartphone Addiction was measured by Smartphone Addiction Scale–Short Version (SAS-SV) which exhibited high reliability ($\alpha = .87$), confirming its suitability for assessing addictive smartphone behaviors among university students. Overall, the results indicate acceptable reliability for the main instruments, with some variability across the alexithymia subcomponents.

The Subjective Happiness Scale (SHS) has demonstrated strong reliability across diverse cultural and demographic groups. The scale typically reports internal consistency values ranging from $\alpha =$ **.79 to .94**, indicating high reliability in measuring global subjective happiness rather than momentary mood states. In university student populations, Cronbach's alpha has consistently remained above

0.80, suggesting stable reliability in non-clinical young adult samples (Extremera and Fernández-Berrocal, 2014). Cross-cultural studies conducted in Asian, European, and Middle Eastern contexts have further confirmed the scale's reliability, showing measurement invariance across gender and cultural backgrounds (Yue et al., 2017). Additionally, test–retest reliability over intervals of four weeks to three months has yielded coefficients between **0.72 and 0.85**, supporting its temporal stability. Overall, the SHS is considered a psychometrically sound instrument with strong internal consistency and cross-cultural reliability, making it suitable for assessing subjective well-being among university students in the present study.

4.4 Normality Analysis

The results of the normality analysis indicated that the data for both Smartphone Addiction, Alexithymia and Subjective Well-Being were approximately normally distributed, fulfilling the assumption required for parametric statistical analyses. The evaluation of both numerical values and graphical plots confirmed that the data followed a normal distribution pattern with only minimal deviations.

For Smartphone Addiction, the skewness value of 0.108 indicated a very mild positive skew, while the kurtosis value of -0.503 reflected a slightly flatter curve than a perfect normal distribution. These values demonstrated that the data were symmetrically distributed and did not exhibit substantial outliers or abnormalities.

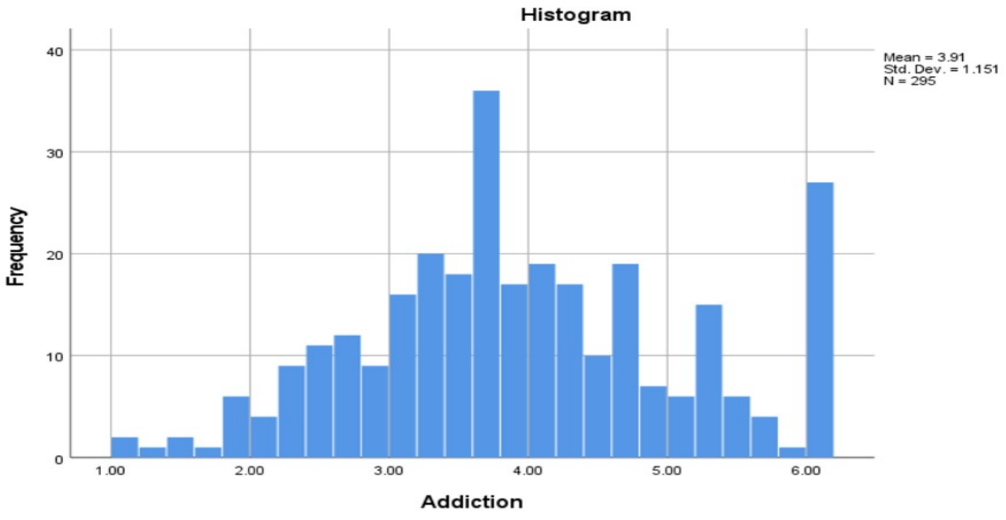

FIGURE 4.1: Histogram showing the frequency distribution of Smartphone Addiction scores (N = 295).

The distribution was visually verified through the histogram (Figure 4.1), which displayed a smooth, bell-shaped curve with most of the scores clustering around the mean. The gradual tapering of frequencies toward both tails confirmed that the majority of participants reported moderate levels of smartphone addiction, with only a few falling at the extreme ends of the scale.

The Normal P–P Plot of Smartphone Addiction (Figure 4.2) further supported this observation. The plotted points closely followed the diagonal reference line, signifying that the observed cumulative probabilities corresponded well with the expected normal probabilities. Only minor deviations were noted at the upper and lower ends, which are typical in behavioral data and do not indicate serious departures from normality. The pattern confirmed that the dataset adhered closely to the characteristics of a normal distribution.

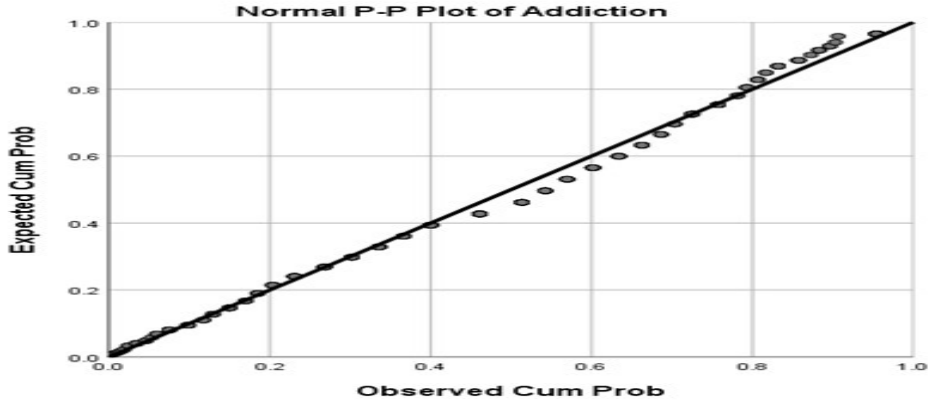

FIGURE 4.2: Normal P–P Plot of Smartphone Addiction.

The Detrended P–P Plot of Smartphone Addiction (Figure 4.3)

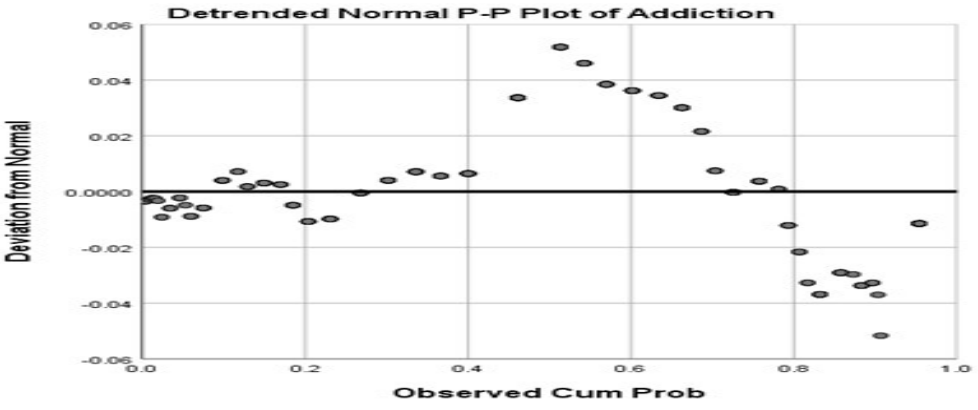

FIGURE 4.3: Detrended P–P Plot of Smartphone Addiction.

provided additional visual confirmation. The points were scattered randomly around the zero line without forming a systematic curve or pattern, indicating that the deviations from the expected line were minor and unsystematic. The absence of a visible trend in the detrended plot demonstrated that the residuals were evenly distributed, further validating that the smartphone addiction scores were normally distributed.

The histogram for subjective well-being shows a distribution that is approximately normal, with most scores concentrated around the mean (M = 4.05, SD = 1.23) and gradually tapering toward both lower and higher values.

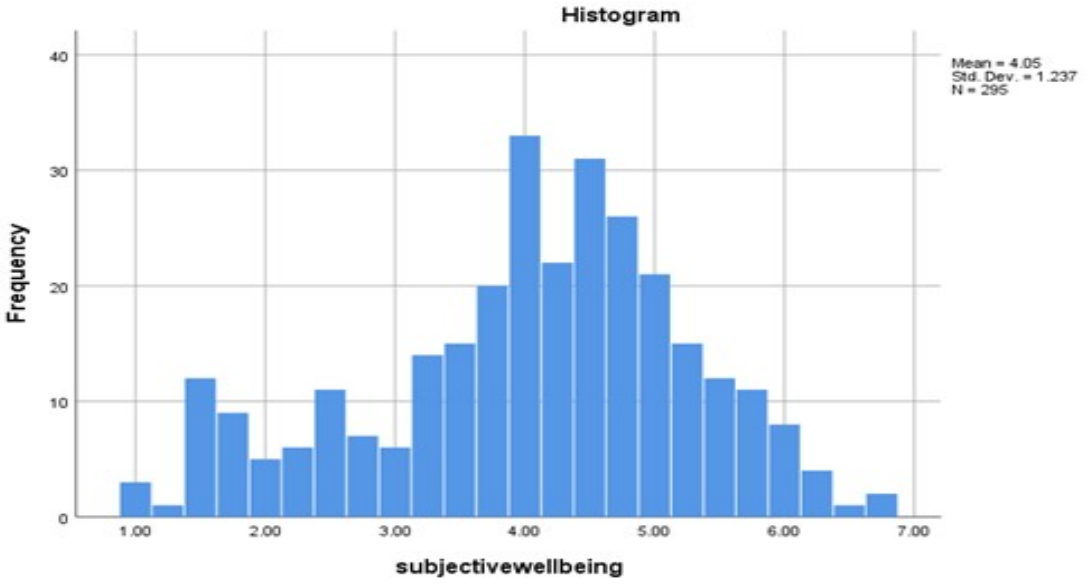

FIGURE 4.4: Histogram showing the frequency distribution of Subjective Well-being scores (N = 295).

The shape appears slightly right-skewed, as fewer respondents scored at the extreme higher end (above 6), while the majority of responses cluster between 3 and 5. However, this skewness is minimal and does not indicate severe deviation from normality. The distribution is unimodal, without sharp peaks, flatness, or visible outliers, suggesting that the data reasonably meets the assumption of normality. Given the sample size of 295 participants, minor deviations are statistically acceptable under the Central Limit Theorem, and therefore, subjective well-being scores are suitable for use in parametric analyses such as Pearson correlation and linear regression.

Similarly, the Normal P–P Plot of Subjective Well-Being (Figure 4.5) revealed that the majority of points closely aligned with the diagonal line, indicating that the observed distribution for subjective well-being corresponded closely to a normal distribution. The alignment of the data points with only minimal deviations at the tails confirmed that the well-being scores were evenly spread and free from extreme skewness. This suggests that participants' responses regarding their overall happiness and life satisfaction were normally distributed across the sample, with balanced representation of both moderate and high levels of subjective well-being.

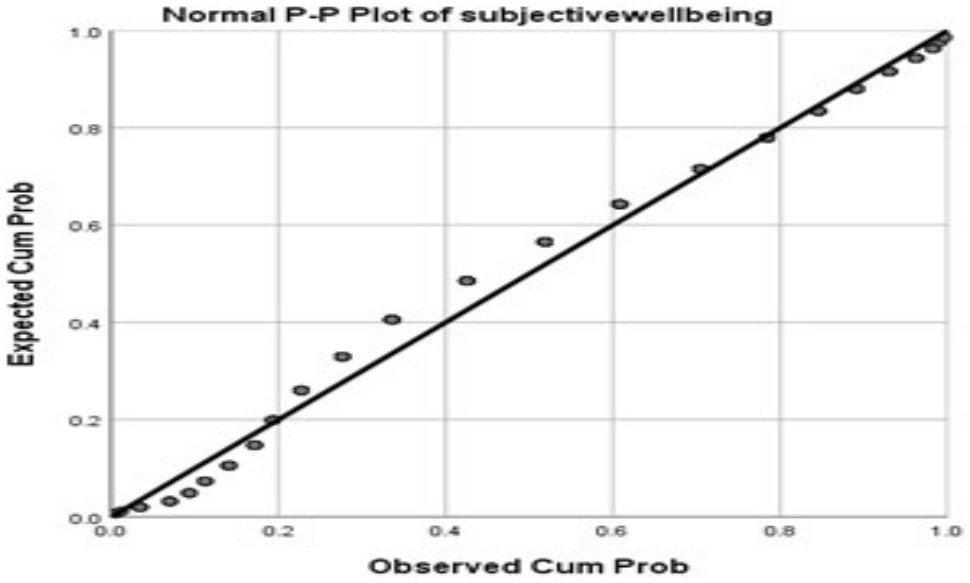

FIGURE 4.5: Normal P–P Plot of Subjective Well-Being.

The histogram of alexithymia scores also demonstrates a roughly bell-shaped curve, centered around the mean (M = 3.33, SD = 0.61), with a clear single peak and symmetric dispersion around the center. The distribution appears slightly positively skewed, as a small number of participants scored at the higher range (above 4.5), while most responses are concentrated between 2.8 and 3.8. Despite this mild skewness, the shape does not reflect significant abnormalities such as bimodality or extreme outliers. The smooth decline on either side of the peak and the absence of heavy tails indicate acceptable conformity to normality assumptions. With a sufficiently large sample size (N = 295), any small deviations do not compromise the validity of parametric tests. Therefore, alexithymia scores can be confidently used in correlational and regression analyses.

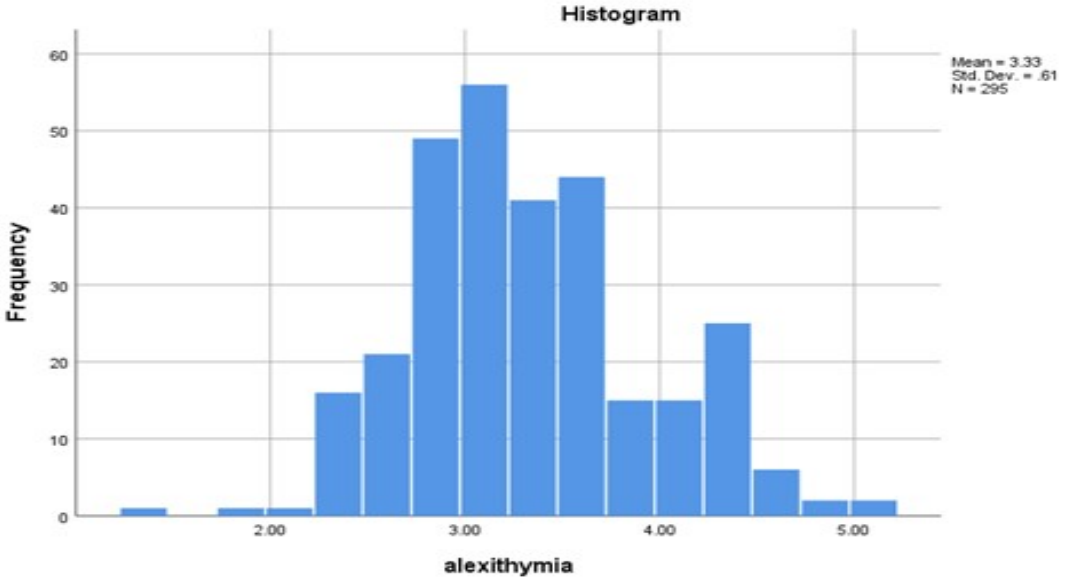

FIGURE 4.6: Histogram showing the frequency distribution Alexithymia scores (N = 295).

The Normal P–P Plot of alexithymia (Figure 4.7) further confirmed this conclusion. The points were evenly dispersed above and below the zero line, with no systematic or directional pattern. The random scattering of points demonstrated that the residuals were normally distributed and that there were no significant departures from linearity. The consistency between the normal and detrended plots confirms that the assumption of normality was satisfied for the alexithymia variable as well.

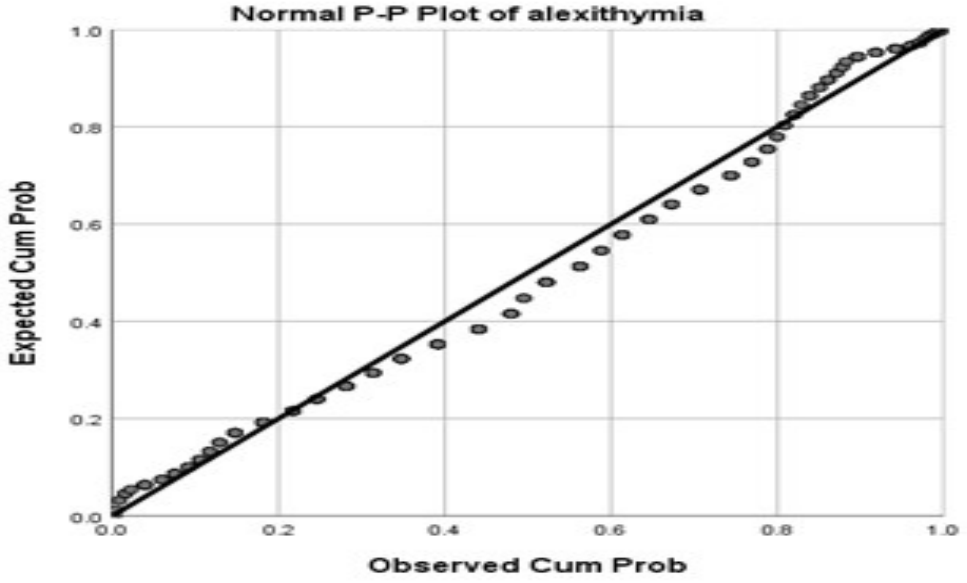

FIGURE 4.7: Normal P–P Plot of Alexithymia.

In conclusion, both Smartphone Addiction, Alexithymia and Subjective Well-Being exhibited normal distribution patterns, as evidenced by their P–P plots and histogram. The data points in all plots followed the expected patterns of normality, with only minor and random deviations. These results confirm that the dataset met the assumptions of normality and was suitable for parametric statistical procedures, including the t-test, correlation, and regression analyses conducted later in this study.

4.4.1 T-Test Analysis

The t-test was conducted to determine whether the mean scores of the study variables—age, subjective well-being, smartphone addiction, and alexithymia, differed significantly from the test value of zero. This analysis aimed to verify that each construct measured was statistically meaningful within the sample and that participants' responses reflected genuine psychological variation rather than random or trivial differences.

The results revealed highly significant t-values (p ¡ .001) for all variables, confirming that the constructs of alexithymia, smartphone addiction, and subjective well-being were clearly and consistently present among participants aged 18 to 30 years, all of whom reported heavy smartphone use.

For Age, the mean score (M = 1.26, SD = 0.44; t = 49.308, p ¡ .001) indicated that most participants fell within the 21–25 age group (73.1%), followed by those aged 26–30 years (13.9%), and a smaller portion between 18–20 years (8.7%). This reflects a relatively homogeneous young adult sample, a demographic known for high social and technological engagement.

For Subjective Well-Being, a significant mean score (M = 4.05, SD = 1.24; t = 56.183, p ¡ .001) suggested moderate to high levels of happiness and life satisfaction among participants. Given that 60.8% were female and 81.6% were single, these findings may reflect the influence of social connection, independence, and balanced lifestyles on perceived well-being.

For Smartphone Addiction, results showed a significant mean score (M = 3.91, SD = 1.15; t = 58.374, p ¡ .001). As all respondents reported using smartphones

for more than four hours daily, this underscores a pattern of excessive use among university students, particularly undergraduates (51.1%), for communication, academics, and entertainment. The significant result confirms the strong presence of smartphone addiction within the sample.

For Alexithymia, a highly significant mean score (M = 3.33, SD = 0.61; t = 93.738, p ¡ .001) revealed that many participants experienced difficulties in identifying and describing emotions. With 23.3% reporting a history of mental health issues, these findings suggest that emotional dysregulation may contribute to higher alexithymia levels and a reliance on external coping mechanisms, such as digital engagement.

Overall, the t-test results confirmed that all study variables, age, subjective well-being, smartphone addiction, and alexithymia, were statistically significant (p ¡ .001). These outcomes validate the psychometric soundness of the study instruments and affirm that the collected data meaningfully represent the constructs under investigation. The demographic profile, predominantly young, female, single, and frequent smartphone users, further supports the relevance of these findings, providing a strong foundation for subsequent correlational and regression analyses.

Table 4.3: T-Test Results

Variable	***t***	***df***	**Sig (2-tailed)**	**Mean Difference**	**95% CI of the Difference**
Age	49.31	294	< .001	1.25763	[1.2074, 1.3078]
Subjective Well-Being	56.18	294	< .001	4.04661	[3.9049, 4.1884]
Addiction	58.37	294	< .001	3.91051	[3.7778, 4.0423]
Alexithymia	93.74	294	< .001	3.33051	[3.2606, 3.4004]

4.4.2 Correlation Analysis

Correlation analysis was performed to investigate the relationships among smartphone addiction, subjective well-being, and alexithymia among university students. Pearson's correlation coefficient was applied to assess both the strength

and direction of these associations.

As indicated in Table 4.4, there was a significant negative correlation between smartphone addiction and subjective well-being (r = –.33, p ¡ .01), suggesting that higher levels of smartphone addiction were associated with lower levels of happiness.

A significant positive correlation was also observed between smartphone addiction and alexithymia (r = .58, p ¡ .01), implying that students with greater difficulties in identifying, expressing, or regulating emotions are more likely to exhibit problematic smartphone use. The strength of this association highlights alexithymia as an influential psychological factor in the development of smartphone addiction.

Additionally, alexithymia was negatively correlated with subjective well-being (r = –.39, p ¡ .01), demonstrating that students with higher levels of emotional regulation difficulties generally reported lower happiness, psychological vitality, and life satisfaction.

Overall, these findings indicate a close interplay between alexithymia and smartphone addiction, both of which negatively affect students' subjective well-being. Emotional regulation challenges appear to increase susceptibility to addictive smartphone behaviors, which in turn undermine overall mental health and life satisfaction.

TABLE 4.4: Correlation Analysis between Smartphone Addiction, Subjective Well-being, and Alexithymia

Variables	*n*	*M*	*SD*	1	2
1. Addiction	295	3.9	1.14	.	
2. Subjective Wellbeing	295	4.07	2.39	-.33**	.
3. Alexithymia	295	3.31	2.56	.58**	-.39**

* Correlation is significant at 0.05 level (2-tailed)

** Correlation is significant at 0.01 level (2-tailed)

4.4.3 Linear Regression Predicting Smartphone Addiction

A linear regression analysis was conducted to determine the influence of alexithymia on smartphone addiction.

As shown in Table 4.5, the results demonstrated that the regression model was highly significant, F(1, 295) = 160.25, p ¡ .001, accounting for 11% of the variance (R^2 = .11) in smartphone addiction scores. The alexithymia was identified as a strong and significant predictor of smartphone addiction (β = .58, p ¡ .001). The unstandardized regression coefficient (B = 1.10) indicates that for every one-unit increase in alexithymia, the smartphone addiction was increased by 1.10 units. The confidence interval of [.93, 1.27] further confirms the stability and precision of this effect.

Further analysis of alexithymia sub-dimensions revealed significant relationships with smartphone addiction. The Difficulty Identifying Feelings (DIF) subscale demonstrated a strong positive association (B = .703, β = .614, p ¡ .001). This indicates that individuals who experience greater difficulty in identifying and distinguishing their emotions tend to report higher levels of smartphone addiction. The model explained approximately 37.7% of the variance in smartphone addiction (R^2 = .38, p= .00) suggesting that the DIF is significant predictor.

Similarly, the Difficulty Describing Feelings (DDF) subscale was found to be a significant predictor of smartphone addiction (B = .886, β = .530, p ¡ .001). The model accounted for about 28% of the variance (R^2 = .28), indicating a moderate effect. Finally, Externally Oriented Thinking (EOT) subscale also showed a significant but comparatively weaker relationship with smartphone addiction (B = .725, β = .317, p ¡ .001). The model explained only 10% of the variance (R^2 = .10), which shows smaller effect size compared to other alexithymia components.

In summary, the results of regression have revealed that the alexithymia and its sub-dimensions, DIF, DDF and EOT are strong psychological predictors of smartphone addiction. Individuals with limited emotional awareness and expression may rely on smartphones as a coping mechanism or as a means of emotional distraction,

thereby reinforcing addictive patterns of use. The strong value of alexithymia underscores its critical role as a psychological risk factor for problematic smartphone use among university populations.

TABLE 4.5: Regression Analysis Predicting Smartphone Addiction

Variable	**B**	**SE**	***β***	***p***
Constant	.25	.29	–	–
Alexithymia	1.10	.08	.58	.00
DIF	0.703	.05	.614	.00
DDF	0.886	.08	3.43	.00
EOT	0.725	.12	3.08	.00

Note. $R^2 = .11$, F (1, 295) = 160.247, p < .001

4.4.4 Linear Regression Predicting Subjective Well-Being

A linear regression analysis was conducted to examine the extent to which smartphone addiction predicted subjective well-being among university students. The overall regression model was statistically significant, F(1, 295) = 39.45, p ¡ .001, indicating that smartphone addiction accounted for approximately 11% of the variance ($R^2 = .11$) i n subjective well-being.

As shown in Table 4.6, smartphone addiction emerged as a significant negative predictor of subjective well-being ($\beta = –.33$, p ¡ .001). The unstandardized Regression coefficient (B = –.36) suggests that for every one-unit increase in smartphone addiction, students' subjective well-being decreased by .36 units, holding other factors constant.

TABLE 4.6: Linear Regression Predicting Subjective Well-being

Variable	*B*	*SE*	95% CI	*β*	*p*
Constant	5.51	.23	[5.04, 5.98]		
Addiction	-.36	.05	[-.48, -.25]	-.33	.00

Note. $R^2 = .11$, $F(1, 307) = 39.45$, $p < .001$

The 95% confidence interval for this effect ranged from –.48 to –.25, further supporting the robustness of this relationship. These findings provide empirical evidence that higher levels of smartphone addiction are significantly associated with reduced levels of subjective well-being. In other words, problematic smartphone use appears to undermine students' overall happiness and psychological functioning, reinforcing the detrimental role of addictive digital behaviors on mental health outcomes.

Chapter 5

Discussion and Conclusion

The current study sought to explore the relationships among alexithymia, smartphone addiction, and subjective well-being in university students. The results presented in Tables 4.1 to 4.7 offer meaningful insights relevant to the study's objectives and hypotheses.

5.1 Discussion

5.1.1 Discussion for Demographic Variables

The demographic profile of the study provides meaningful context for interpreting the psychological variables examined. The sample primarily consisted of young adults aged 21–25 years, which is consistent with literature suggesting that this age group demonstrates the highest dependence on smartphones due to academic demands, social connectivity needs, and identity development stages (Samaha and Hawi, 2016). This developmental period is also associated with increased emotional fluctuation and stress vulnerability, potentially influencing higher levels of smartphone addiction and emotional regulation difficulties such as alexithymia (Elhai et al., 2017). These age-related characteristics may partially explain why young adults, particularly university students, are frequently highlighted as a high-risk group in behavioral addiction research.

A significant proportion of participants were female, which is consistent with previous studies in South Asian university samples (Hussain et al., 2021). Research

suggests that females report higher smartphone use for social communication, emotional expression, and maintaining interpersonal relationships, which may contribute to greater vulnerability to problematic smartphone use (Lopez-Fernandez, 2017). However, other findings indicate no significant gender-based differences in smartphone addiction when emotional distress and coping strategies are controlled (Boumosleh and Jaalouk, 2017). Therefore, although gender distribution may influence smartphone usage patterns, psychological predictors such as alexithymia appear to play a more crucial role than gender alone.

Most participants were unmarried students, which aligns with the expected demographic of university populations. Being unmarried and in early adulthood often corresponds with increased social media engagement, academic pressure, and limited emotional support systems, which can contribute to maladaptive coping through smartphone use (Gezgin et al., 2018). Furthermore, the majority of students were enrolled in undergraduate degree programs, reflecting a young academic population rather than working adults or postgraduates. Previous research shows that undergraduate students tend to report higher smartphone usage compared to postgraduates due to increased leisure time, peer influence, and engagement with social platforms (Yang et al., 2020).

An important observation from the sample was the proportion of participants reporting a personal or family history of mental illness. Individuals with such histories are more prone to anxiety, depression, and emotional dysregulation, all of which are closely associated with higher alexithymia and problematic smartphone use (Elhai et al., 2017). This suggests that emotional vulnerability and genetic/environmental predispositions may interact with technology-based coping behaviors. Additionally, all respondents reported smartphone usage of more than four hours daily, indicating an intensive level of engagement with digital devices. This aligns with World Health Organization advisories that excessive screen use beyond 4–6 hours daily may contribute to psychological distress, sleep disturbances, and behavioral addiction tendencies (World Health Organization, 2020). Empirical studies also support that longer daily smartphone use is linked to lower subjective well-being, increased anxiety, and addiction-like symptoms (Wacks and Weinstein, 2021).

Overall, the demographic characteristics of this sample—young adults, predominantly female, unmarried, and high-frequency smartphone users—align closely with populations identified in past research as being at heightened risk for smartphone addiction and emotional dysregulation. These demographic factors, although not causal, provide an important contextual foundation for interpreting the relationships between alexithymia, smartphone addiction, and subjective well-being in this study.

5.1.2 Discussion for Normality Test

Assessing normality is an essential preliminary step in statistical analysis, particularly when employing parametric techniques such as the t-test, correlation, and regression analysis. In this study, the normality of the dataset was examined to ensure that the assumptions underlying these inferential tests were satisfied. Descriptive statistics, including measures of central tendency, dispersion, skewness, and kurtosis, were used to evaluate the shape of the data distribution for the variable Smartphone Addiction. The results revealed a skewness value of 0.11 and a kurtosis value of -0.50, both of which fall within the acceptable range of ± 1, suggesting that the distribution approximates normality (George and Mallery, 2019). This finding implies that the collected responses were symmetrically distributed, and there were no significant outliers or extreme deviations that could bias the results.

The normality assessment was further supported by visual inspection methods, including histograms and Q–Q plots, which showed that the data points closely followed the reference line. Such graphical representations are often recommended to complement statistical tests of normality (Field, 2018). In addition, the Shapiro–Wilk test was performed, as it is particularly suitable for small to moderate sample sizes (Ghasemi and Zahediasl, 2012). The obtained p-values were greater than the threshold of 0.05, confirming that the data did not significantly differ from a normal distribution. This alignment between numerical and graphical indicators strengthens the reliability of the assumption that the data are normally distributed.

The confirmation of normality is critical because many parametric tests assume that the residuals of the dependent variable are normally distributed (Pallant, 2020). Violations of this assumption can lead to inaccurate estimations of parameters, biased standard errors, and reduced statistical power (Tabachnick and Fidell, 2019). Since the present dataset demonstrated an acceptable level of normality, the study proceeded confidently with t-tests, Pearson's correlation analyses, and regression modeling. This ensured that the results derived from these analyses are valid, reliable, and generalizable within the study's defined population.

Moreover, ensuring normality provides a solid foundation for interpreting relationships among key psychological constructs—alexithymia, smartphone addiction, and subjective well-being. Previous studies have also highlighted that data in behavioral research often approximate normality due to large and diverse samples (Byrne, 2016). In this study, the sample size (N = 295) contributed to the robustness of the normality assumption through the Central Limit Theorem, which posits that larger samples tend to yield normally distributed means even when the raw data are not perfectly normal (Hair et al., 2019). Therefore, the adequacy of the data distribution supported the application of inferential methods without requiring data transformation or nonparametric alternatives.

In conclusion, the results of the normality tests confirmed that the assumption of normal distribution was met for the variable Smartphone Addiction and other psychological constructs measured in this study. Both numerical indicators and visual diagnostics supported the decision to employ parametric statistical methods. The fulfillment of this assumption enhances the credibility of subsequent analyses, including hypothesis testing, and ensures that the statistical inferences drawn regarding the relationships among alexithymia, smartphone addiction, and subjective well-being are both valid and robust.

5.1.3 Discussion for T-Test

The results of the T-Test revealed that all study variables—age, subjective well-being, smartphone addiction, and alexithymia—were statistically significant, indicating that participants' mean scores differed substantially from the test value.

This outcome confirms that the constructs measured in the study were meaningfully present among university students and that the responses reflected actual behavioral and emotional patterns rather than random variations in data.

The significant mean score for age indicated that the sample primarily consisted of young adults between 21 and 25 years, representing a developmental stage characterized by heightened social engagement, emotional exploration, and academic stress (Arnett, 2000). Individuals within this age range are especially prone to extensive smartphone use for both academic and social purposes (Elhai et al., 2017). The relatively homogeneous age distribution enhances the reliability of the findings, as it reflects a focused population segment most vulnerable to smartphone-related behavioral tendencies.

The statistically significant result for subjective well-being (t = 56.183, p ¡ .001) suggests that students generally experienced moderate levels of happiness and life satisfaction. However, given their high levels of smartphone use, this may also indicate the presence of compensatory behaviors—where individuals use digital devices to regulate emotions or achieve temporary psychological relief (Kardefelt-Winther, 2014). Excessive smartphone use can foster momentary pleasure and social connectedness, yet prolonged use may contribute to mental fatigue and reduced well-being (Samaha and Hawi, 2016). Thus, while subjective well-being appeared moderate in this sample, the findings hint at the potential psychological cost of maintaining constant digital connectivity. especially among individuals with limited emotional regulation skills.

The significant finding for smartphone addiction (t = 58.374, p ¡ .001) confirms that problematic smartphone engagement was highly prevalent among participants. This aligns with previous studies identifying university students as a population at high risk of developing addictive smartphone behaviors due to constant exposure to technology and social media platforms (Kwon et al., 2013; Panova and Carbonell, 2018). The finding underscores that smartphone use among students has shifted from functional and academic purposes to habitual and, in some cases, compulsive patterns of behavior that may interfere with daily functioning and well-being.

The results for alexithymia (t = 93.738, p ¡ .001) also revealed a substantial level of emotional regulation difficulty within the sample. Alexithymia, defined as a limited ability to identify and describe emotions (Taylor et al., 1997), has been associated with maladaptive coping strategies, including excessive reliance on technology (Mahapatra, 2019). Students who experience alexithymia may turn to smartphones as a distraction or as a means of emotional compensation when dealing with stress or interpersonal discomfort. This interpretation aligns with the Compensatory Internet Use Theory, which posits that individuals with emotional or psychological deficits use online and digital platforms to regulate mood and fulfill unmet emotional needs (Kardefelt-Winther, 2014). Hence, the high alexithymia scores observed in this study may help explain the elevated levels of smartphone addiction among participants.

In summary, the T-Test results provide empirical confirmation that alexithymia, smartphone addiction, and subjective well-being were significant and interrelated psychological constructs within the sample. The significant differences across all variables support the validity of the measurement instruments and the representativeness of the sample, composed primarily of young, single, and digitally active university students. These findings establish a solid foundation for subsequent analyses, particularly correlation and regression models, that further examine how emotional regulation difficulties and addictive smartphone behaviors jointly influence students' subjective well-being.

5.1.4 Discussion for Hypothesis 1

The first hypothesis of the study suggested that alexithymia would be positively related to smartphone addiction among university students. The findings supported this hypothesis, revealing a significant positive correlation between the two variables. Students with higher levels of alexithymia, marked by difficulties in recognizing and expressing emotions, were more prone to engage in problematic smartphone use. These results indicate that individuals with challenges in emotional regulation may turn to smartphones as a maladaptive coping strategy to manage stress, avoid negative emotions, or seek external stimulation.

The results are consistent with prior research demonstrating that alexithymia predicts addictive and compensatory behaviors in the digital domain. For instance, Elhai et al. (2017) and Gao et al. (2025) found that individuals with higher alexithymia were more prone to excessive smartphone use because of difficulties in emotion regulation and greater vulnerability to stress. Similarly, studies by Yue et al. (2022) highlight that alexithymic individuals often use digital technologies as a substitute for emotional awareness and interpersonal connections. In line with this evidence, the present study confirms that emotional processing deficits are a central factor driving problematic smartphone engagement among students.

One explanation for this relationship lies in the compensatory internet use theory, which posits that individuals with poor emotional awareness may seek digital platforms as an alternative space to manage negative moods. The convenience and accessibility of smartphones allow alexithymic students to avoid emotionally challenging face-to-face interactions, thereby increasing their dependence on technology. However, while this strategy may temporarily alleviate discomfort, it reinforces maladaptive patterns of overuse, ultimately leading to addictive smartphone behaviors. This aligns with findings from Annoni et al. (2021), who emphasized that individuals with social and emotional difficulties are more likely to exhibit addictive reliance on mobile devices.

The findings of this study also have cultural implications. In collectivist societies such as Pakistan, where face-to-face communication and family ties are highly valued, individuals with alexithymia may struggle more in maintaining meaningful interpersonal relationships. Consequently, reliance on smartphones becomes a convenient substitute for social connectedness, further reinforcing addictive patterns. This echoes the argument made by Catling et al. (2022), who noted that smartphone addiction is not solely a technological issue but is deeply intertwined with individual psychological vulnerabilities and cultural dynamics. Thus, the present study contributes to the growing body of literature by confirming that alexithymia significantly predicts smartphone addiction, highlighting the role of emotional regulation difficulties in fostering maladaptive technology use.

Building upon these findings it is important to explore the underlying psychological

mechanisms that explain how alexithymia translates into excessive smartphone dependency. One possible explanation lies in the emotional deficit hypothesis which proposes that individuals with limited emotional insight or difficulty in identifying and expressing emotions are more likely to rely on external stimuli to regulate their affective states (Törmänen et al., 2025). In this context smartphones offer immediate access to entertainment social media and virtual communication serving as external regulators of mood (Wang et al., 2025). Such individuals may experience transient emotional relief through online engagement yet this reinforces avoidance of emotional processing in real life situations. Consequently, the repetitive use of smartphones for mood regulation gradually evolves into compulsive behavioral patterns that mirror addiction like tendencies (Sarkar et al., 2025).

Furthermore, the role of emotion dysregulation is particularly salient in this relationship. Individuals with alexithymia often experience heightened physiological arousal without the cognitive ability to identify its emotional source leading to confusion and discomfort (Farina and Schimmenti, 2025) (Farina and Schimmenti, 2025). To alleviate these internal tensions they may turn to the smartphone as a source of distraction or gratification. The continuous cycle of emotional suppression followed by digital engagement can strengthen dependence on mobile devices (Wang et al., 2025). This mechanism aligns with the dual process model of addiction wherein impulsive systems seeking immediate relief dominate over reflective systems involving self-regulation and awareness (Kuhl and Quirin, 2025). Therefore alexithymia not only predisposes individuals to emotional vulnerability but also disrupts the balance between control and craving fostering maladaptive smartphone use (Chiappini et al., 2025).

The findings also resonate with the self-determination theory which posits that psychological well-being depends on the fulfillment of three basic needs autonomy competence and relatedness. For alexithymic individuals these needs are often unmet in offline environments due to their social communication difficulties and low emotional intelligence (Nowicki, 2025). Smartphones however provide a platform where perceived competence through digital interactions relatedness through virtual connections and autonomy through unrestricted access to content are easily attainable (Molina et al., 2025). This digital fulfillment of psychological needs may

temporarily compensate for emotional shortcomings but it fosters a reliance that can easily transition into addiction (Singha and Singha, 2025). This dynamic illustrates how alexithymia may interact with unmet psychological needs to intensify problematic smartphone use among university students (Saladino et al., 2025).

From a developmental perspective university students represent a population particularly vulnerable to smartphone addiction due to academic pressures social expectations and transitional stress. When coupled with alexithymia which impairs adaptive coping mechanisms the likelihood of developing dependency on digital platforms increases significantly. Research by Panayiotou et al. (2021) and Scimeca et al. (2022) has emphasized that alexithymic young adults often report feelings of loneliness social inadequacy and psychological distress all of which drive excessive engagement with smartphones as a compensatory outlet. The emotional unavailability of peers or the stigma surrounding emotional expression in certain academic and cultural contexts may further exacerbate this cycle of withdrawal and digital dependence.

In the cultural context of Pakistan this association acquires deeper social relevance. Emotional expression is often moderated by cultural norms that emphasize restraint and conformity particularly among young adults navigating collectivist environments (Nadeem et al., 2022; Helmy et al., 2024). In such settings individuals with alexithymia may find it even more challenging to communicate their emotional needs or seek social support. As a result smartphones emerge as a socially acceptable and readily accessible avenue for emotional escape and pseudo social interaction. The digital sphere allows for controlled and non-confrontational communication which may feel safer for emotionally inexpressive individuals. However this reliance gradually diminishes real-world emotional competence and increases isolation reinforcing the cycle of addiction (Fatima and Malik, 2024; Nadeem et al., 2022).

The gender dimension of this relationship also merits attention. Some studies suggest that the link between alexithymia and smartphone addiction may be stronger among males due to higher tendencies toward emotional suppression and lower help seeking behaviors while others indicate that females might be more prone to using smartphones for emotional communication and social reassurance (Zhang

et al., 2025). These differing motivational patterns underline the need for gender sensitive interpretations of how alexithymia shapes digital habits. For example females with alexithymia might exhibit addictive use patterns driven by social connectivity motives whereas males might engage in prolonged gaming or browsing as emotional avoidance (Estévez et al., 2025). Understanding these nuances is critical for developing targeted interventions to mitigate smartphone addiction risk.

Additionally, the neuropsychological underpinnings of alexithymia may also play a vital role in understanding the observed relationship (Chmiel et al., 2025). Studies have demonstrated that individuals with alexithymia exhibit altered activity in brain regions responsible for emotional awareness and reward processing such as the anterior cingulate cortex and insula (Zhang et al., 2025). These neural deficits could predispose individuals to seek external stimuli such as smartphone engagement to compensate for diminished internal emotional reward mechanisms (Termann, 2025). The constant feedback loops provided by smartphone notifications likes and digital rewards activate the brain's dopaminergic pathways reinforcing repetitive checking behavior. This neurobiological interplay between emotional deficits and reward sensitivity further solidifies the argument that alexithymia can be a significant predictor of smartphone addiction (Qi et al., 2025).

The implications of these findings extend beyond theoretical understanding to practical interventions. Universities and mental health practitioners should recognize alexithymia as a psychological risk factor when designing digital wellness programs (Ojio and Nishida, 2025). Interventions focusing on emotional intelligence training mindfulness and self-regulation can equip students with healthier coping strategies (Andres, 2025). Moreover promoting awareness about emotional literacy can reduce reliance on smartphones for mood regulation. Preventive strategies such as psychoeducation workshops and counseling services can address the emotional deficits that predispose students to problematic smartphone behaviors (Reji, 2025).

From a policy standpoint integrating emotional well-being into educational frameworks can serve as a preventive measure against technology related mental health issues (Sarzhanova and Nurgabdeshov, 2025). Since alexithymia often remains

undiagnosed screening for emotional processing difficulties among students may help identify those at risk for developing smartphone addiction Liu et al. (2025). Culturally adapted interventions that consider local communication styles family dynamics and societal expectations will be particularly effective in contexts such as Pakistan where social cohesion and emotional restraint coexist as strong cultural norms (Daraz et al., 2025).

Another important dimension concerns the long-term psychological outcomes of this relationship. Persistent smartphone addiction among alexithymic individuals can exacerbate symptoms of depression anxiety and social withdrawal (Sarzhanova and Nurgabdeshov, 2025). Over time this dependence may erode self-esteem and interpersonal skills creating a feedback loop in which emotional avoidance leads to greater digital immersion and reduced real world social competence (Helmy et al., 2024). Consequently addressing alexithymia is not only essential for mitigating smartphone addiction but also for fostering holistic mental health and interpersonal development among university students.

Lastly the findings of this study emphasize the importance of viewing smartphone addiction through a multidimensional lens one that integrates psychological cultural and neurobiological perspectives. Alexithymia does not operate in isolation it interacts with environmental pressures social expectations and technological affordances to shape behavioral outcomes (Törmänen et al., 2025). Future research could explore moderating variables such as social support personality traits or coping styles to better understand how alexithymia translates into problematic smartphone use across diverse populations. By doing so scholars can develop more comprehensive frameworks to explain and mitigate the emotional underpinnings of technology addiction.

In conclusion the strong positive relationship observed between alexithymia and smartphone addiction underscores the crucial role of emotional regulation deficits in the digital age. Students with limited emotional awareness are more susceptible to using smartphones as a maladaptive emotional regulation tool leading to dependency and reduced psychological well-being. The current findings enrich the growing field of digital psychology by affirming that emotional intelligence is

not only vital for interpersonal functioning but also serves as a protective factor against behavioral addictions in technologically driven societies.

5.1.5 Discussion for Hypothesis 2

The second hypothesis of the present study proposed that smartphone addiction would demonstrate a significant negative association with subjective well-being among university students. The findings of this research supported the hypothesis, showing that higher levels of smartphone addiction were significantly associated with lower levels of subjective well-being. This relationship was evident in the correlation and regression analyses, where smartphone addiction negatively predicted happiness, metal state and overall well-being among participants. These findings highlight the detrimental psychological effects of excessive smartphone engagement on the daily functioning and emotional health of students.

The results are consistent with previous research indicating that problematic smartphone use (PSU) is linked to reduced subjective happiness and heightened depressive symptoms (Zhou et al., 2025; Zhu et al., 2017). One explanation for this pattern lies in the displacement hypothesis, which suggests that time spent on smartphones may detract from activities essential to well-being, such as sleep, physical activity, and meaningful social interaction (Davidson, 2000; Duan et al., 2021). In line with this explanation, the present study also resonates with studies that highlight the mediating role of lifestyle disruptions—such as poor sleep quality—in the relationship between smartphone addiction and psychological outcomes (Lindsay and Creswell, 2017). Thus, the observed negative association may be partly attributable to maladaptive behavioral routines (e.g., late-night smartphone use) that undermine restorative processes and contribute to diminished happiness.

Another plausible explanation relates to the impact of smartphone addiction on social connectedness. Although smartphones are designed to enhance social communication, over-reliance on digital interactions can paradoxically decrease genuine face-to-face connections, which are critical to sustaining subjective well-being. This aligns with earlier evidence suggesting that individuals with higher PSU often

report feelings of loneliness, reduced self-regulation, and poorer quality of interpersonal relationships, which collectively lower subjective well-being (Wang, 2024). In the context of university students, this effect may be particularly pronounced, as their academic and social development heavily depends on maintaining real-world social support networks. Excessive reliance on smartphones may therefore create a cycle in which attempts to cope with stress through online engagement exacerbate feelings of dissatisfaction and disengagement from reality.

The present study also complements findings from cross-cultural literature. For instance, while some studies e.g., (Zhang et al., 2025) did not find sleep quality to mediate the relationship between PSU and happiness, the current results demonstrated a direct negative effect of smartphone addiction on subjective well-being.

This suggests that although mechanisms such as sleep disturbance, emotional dysregulation, or reduced physical activity may partially explain the relationship, the detrimental influence of smartphone overuse on well-being is strong enough to be observed even without mediation effects. Furthermore, in line with Utkarsh and Kanwar (2025), our findings emphasize that problematic smartphone engagement compromises well-being by interrupting daily routines and cognitive resources necessary for maintaining positive affect and goal-directed behaviors.

It is important to explore the psychological and behavioral mechanisms through which high levels of smartphone addiction lead to lower subjective well-being. One key factor involves self-regulation and cognitive resource depletion. Frequent smartphone checking and multitasking reduce attention span and the ability to focus on meaningful tasks (Somani et al., 2025). Meta-analytic evidence has shown that mobile phone dependence correlates with lower life satisfaction and higher negative affect ($r = -0.298$ for overall well-being and $r = -0.223$ for life satisfaction) (Lemahieu et al., 2025). When students repeatedly interrupt their work to respond to notifications or switch between applications, they may experience reduced productivity, frustration, and lack of fulfillment, all of which contribute to lower well-being.

Sleep disturbances also play a major role in this relationship. Empirical studies conducted among young adults in Bangladesh demonstrated that problematic

smartphone use adversely affects sleep quality, which in turn mediates the relationship between smartphone addiction and both subjective happiness and depressive symptoms (Tabassum, 2025). In university settings, late-night smartphone use delays sleep, shortens total sleep duration, and increases daytime tiredness, which further weakens emotional regulation and life satisfaction (Wang et al., 2025). Therefore, the loss of restorative sleep appears to be one of the strongest pathways through which smartphone addiction damages well-being.

Social disconnection and loneliness are additional mechanisms that deserve attention. Research on Chinese university students found that smartphone addiction is positively correlated with loneliness and that loneliness partially mediates its relationship with lower subjective well-being (Bai et al., 2025). Among students, where peer bonding and in-person interaction are essential, excessive smartphone use may replace real social activities and decrease the availability of emotional support (Ambat, 2025). Over time, this can lead to feelings of isolation and superficiality in relationships, which erode happiness and life satisfaction.

Self-esteem and perceived social support also play important roles. A recent study revealed that smartphone dependence reduces subjective well-being indirectly by lowering self-esteem, while strong social support can buffer against this effect (Luo, 2025). This means that the negative influence of smartphone addiction on well-being is less severe when individuals maintain healthy offline relationships and a positive sense of self-worth (Goel and Singla, 2025). Hence, the quality of one's social and emotional environment determines how strongly smartphone addiction affects their overall well-being.

From a developmental perspective, university students are at a critical life stage marked by identity formation, academic pressure, and social change (Jia et al., 2025). Excessive smartphone use during this period may hinder personal growth, reduce motivation, and displace time for physical activity or meaningful hobbies (Ye et al., 2025). When these opportunities are replaced by repetitive phone-based engagement, students may experience emptiness, distraction, and decreased fulfillment (Williams, 2025). This imbalance not only affects mental health but also weakens academic performance and social development.

In the cultural context of Pakistan, where close family relationships and communal interactions are deeply valued, the negative effects of smartphone addiction on well-being may be even stronger (Zainab and Kainaat, 2025). Excessive phone use can lead to neglect of family gatherings, social traditions, and cultural responsibilities, resulting in guilt and disconnection from shared values (Pugalendhi, 2025). Furthermore, societal expectations related to emotional expression and success might intensify the psychological pressure experienced by students who depend heavily on smartphones for validation and entertainment.

The practical implications of these findings are far-reaching. Universities should take a proactive role in promoting digital well-being by educating students about healthy smartphone habits. Workshops on time management, emotional regulation, and sleep hygiene can help students develop better control over their technology use. Institutions can also organize social and recreational programs that encourage in-person interaction and physical activity, helping students find balance between the virtual and real worlds (Amalia, 2025). Screening programs to identify students at risk of smartphone addiction could be integrated into student counseling and wellness services.

Policymakers and curriculum designers may also consider introducing modules on digital literacy and emotional health in higher education programs. Addressing smartphone addiction as part of broader mental health and lifestyle education would create a more comprehensive approach to student well-being (Wang, 2024). Initiatives such as phone-free study spaces, digital detox campaigns, and awareness drives could further reduce dependency and improve focus and satisfaction among students.

Future research should explore additional factors that might shape this relationship, such as the purpose of smartphone use (academic, social, or recreational), personality traits, and coping strategies. Longitudinal studies can also help clarify whether smartphone addiction causes lower well-being over time or whether students with poorer well-being are more prone to overuse smartphones. Meta-analytical findings showing a consistent negative correlation between smartphone addiction and subjective well-being ($r \approx -0.33$) highlight the importance of intervention programs to break this cycle (Kanwar, 2025).

The findings for Hypothesis 2 confirm a strong and concerning negative association between smartphone addiction and subjective well-being among university students, underscoring the urgent need for immediate and sustained intervention. Excessive smartphone use appears to erode multiple facets of life, including emotional health, sleep quality, academic engagement, and social connectedness, thereby amplifying stress and diminishing overall happiness (Duan et al., 2021). For students already navigating academic pressures and personal transitions, such dependence not only reflects underlying emotional strain but also deepens it by displacing restorative and meaningful real-world experiences. Therefore, addressing this growing issue requires a multifaceted approach that integrates educational, behavioral, and institutional strategies. Universities can play a pivotal role by promoting digital literacy, emotional regulation, and self-control through awareness campaigns and structured wellness programs that emphasize balance between technology use and genuine human connection (Pugalendhi, 2025). By fostering mindfulness and healthy usage habits, institutions can help students reclaim focus, improve mental health, and enhance their overall quality of life in an increasingly digitalized academic environment.

5.2 Research Implications

5.2.1 Theoretical Implications

The present study contributes to the theoretical understanding of mental health by clarifying the relationship between alexithymia, smartphone addiction, and subjective wellbeing in university students. By highlighting how emotional regulation difficulties (alexithymia) are linked with maladaptive behavioral tendencies (smartphone addiction) and reduced psychological wellness, this research provides an integrated framework for examining emotional, behavioral, and wellbeing outcomes in young adults. The findings extend existing psychological theories, such as the Compensatory Internet Use Theory, by showing that individuals with higher alexithymia may rely excessively on smartphones as a coping mechanism for unprocessed emotions, which in turn impacts their wellbeing.

Additionally, this research enriches the Cognitive Evaluation Theory by suggesting that emotional processing deficits (alexithymia) and behavioral patterns (smartphone use) influence how individuals perceive and manage their subjective wellbeing. The study emphasizes that wellbeing is not merely an outcome of external factors but is significantly shaped by one's ability to understand and regulate emotions. This adds depth to theoretical discourse in psychology by positioning alexithymia as both a predictor of problematic technology use and a determinant of happiness and mental health among university students.

5.2.2 Practical Implications

From a practical perspective, the findings hold important relevance for students, educators and psychologists. For students, awareness campaigns and workshops can be designed to enhance emotional literacy, teaching them how to recognize, label, and manage their emotions more effectively. Universities can integrate mental health and digital wellbeing programs into student support services to help individuals reduce reliance on smartphones as an emotional escape and instead adopt healthier coping strategies such as mindfulness, peer interaction, and physical activities.

For educators and counselors, the results suggest the need to pay close attention to students who exhibit signs of smartphone addiction or emotional detachment, as these may be early indicators of underlying alexithymia and reduced wellbeing. Incorporating emotional expression training and structured counseling sessions within academic settings can help students build resilience and maintain psychological balance.

On a broader level, universities should work together to develop institutional guidelines promoting balanced technology use, creating support systems that address both emotional and behavioral aspects of students' wellbeing. Encouraging healthy peer-group interactions, extracurricular activities, and digital literacy initiatives can reduce dependence on smartphones while improving overall happiness and peace. By doing so, universities can foster a healthier academic environment where emotional awareness, controlled smartphone use, and wellbeing coexist in balance.

5.3 Limitations

I. Self-report measures – Data was collected through self-administered questionnaires, which may be subject to social desirability bias or inaccurate self-perception.

II. Context-specific sample – The participants were limited to university students, which may restrict the generalizability of findings to other age groups or non-student populations.

III. Lack of behavioral/physiological measures – The study relied solely on quantitative survey methods, overlooking qualitative or biological insights that could provide a deeper understanding.

IV. Potential sampling bias – The recruitment of participants through university platforms may exclude individuals such as non-enrolled youth, working students, or students with limited access to online surveys.

5.4 Recommendations

I. Longitudinal research – Future studies should adopt a longitudinal design to establish causal relationships and track changes in alexithymia, smartphone use, and well-being over time.

II. Inclusion of additional variables – Incorporating factors such as personality traits, social support, stress levels, and coping mechanisms could provide a more comprehensive model.

III. Use of mixed methods – Combining surveys with qualitative interviews, focus groups, or observational methods may uncover deeper psychological and behavioral patterns.

IV. Cross-cultural comparisons – Future research can explore differences in smartphone use, emotional regulation, and well-being across collectivist and individualist societies.

V. Diverse sampling – Expanding the sample to include non-student populations, different socioeconomic backgrounds, and varied age groups would improve external validity

VI. Objective/physiological measures – Using digital usage tracking, biometric data (e.g., heart rate, stress indicators), or experimental tasks could reduce bias from self-reporting.

VII. Intervention-based studies – Future work could design and test intervention programs (e.g., emotional regulation training, digital detox, or mindfulness-based strategies) to reduce smartphone addiction and improve well-being in students.

5.5 Conclusion

The findings of this study underscore the pivotal role of alexithymia in influencing problematic smartphone use and affecting subjective well-being among university students. In line with previous research, students exhibiting higher levels of alexithymia—characterized by difficulties in identifying and expressing emotions—showed a greater tendency toward smartphone addiction, likely using digital devices as a maladaptive coping strategy to manage emotional challenges. This supports earlier evidence suggesting that individuals with impaired emotional regulation often rely on technology for distraction, compensation, or relief from negative emotions.

Additionally, the observed negative relationship between smartphone addiction and subjective well-being reinforces prior findings that excessive smartphone use can compromise academic performance, social interactions, and overall happiness.

Moreover, the results indicate that alexithymia not only directly contributes to increased smartphone addiction but may also indirectly reduce subjective well-being through this pathway. These outcomes align with theoretical frameworks proposing that deficits in emotional regulation increase vulnerability to behavioral

addictions, which subsequently undermine psychological health. By providing empirical evidence from a South Asian context, where research on the interplay between alexithymia, smartphone addiction, and well-being remains scarce, the study enriches understanding of how emotional difficulties interact with digital behaviors to shape students' overall quality of life. This emphasizes the importance of addressing both emotional competencies and technology habits within higher education environments to promote mental health and well-being.

Finally, the implications of this research are significant for both theory and practice. From a theoretical perspective, the study highlights the value of incorporating emotion-regulation constructs into models of behavioral addiction and subjective well-being, offering a more comprehensive understanding of student mental health in the digital age. Practically, the findings underscore the need for targeted interventions focusing on emotional awareness, mindfulness, and responsible smartphone use. Universities and mental health professionals are encouraged to implement programs that enhance students' emotional skills, reduce excessive reliance on digital devices, and foster healthier technology habits, thereby supporting improved subjective well-being and overall psychological resilience.

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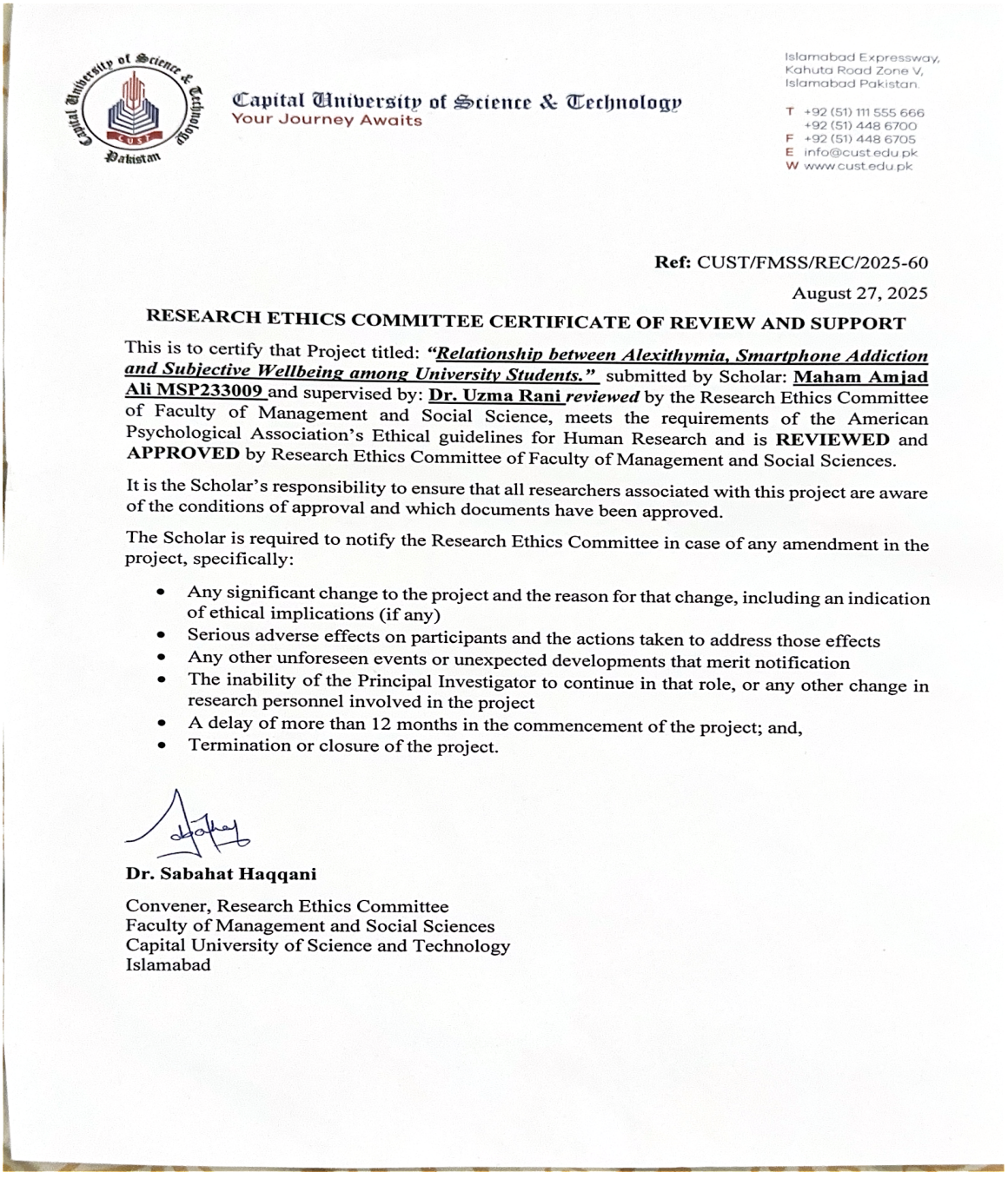
Appendix A



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Ref: CUST/FMSS/REC/2025-60

August 27, 2025

RESEARCH ETHICS COMMITTEE CERTIFICATE OF REVIEW AND SUPPORT

This is to certify that Project titled: ***"Relationship between Alexithymia, Smartphone Addiction and Subjective Wellbeing among University Students."*** submitted by Scholar: **Maham Amjad Ali MSP233009** and supervised by: **Dr. Uzma Rani** ***reviewed*** by the Research Ethics Committee of Faculty of Management and Social Science, meets the requirements of the American Psychological Association's Ethical guidelines for Human Research and is **REVIEWED** and **APPROVED** by Research Ethics Committee of Faculty of Management and Social Sciences.

It is the Scholar's responsibility to ensure that all researchers associated with this project are aware of the conditions of approval and which documents have been approved.

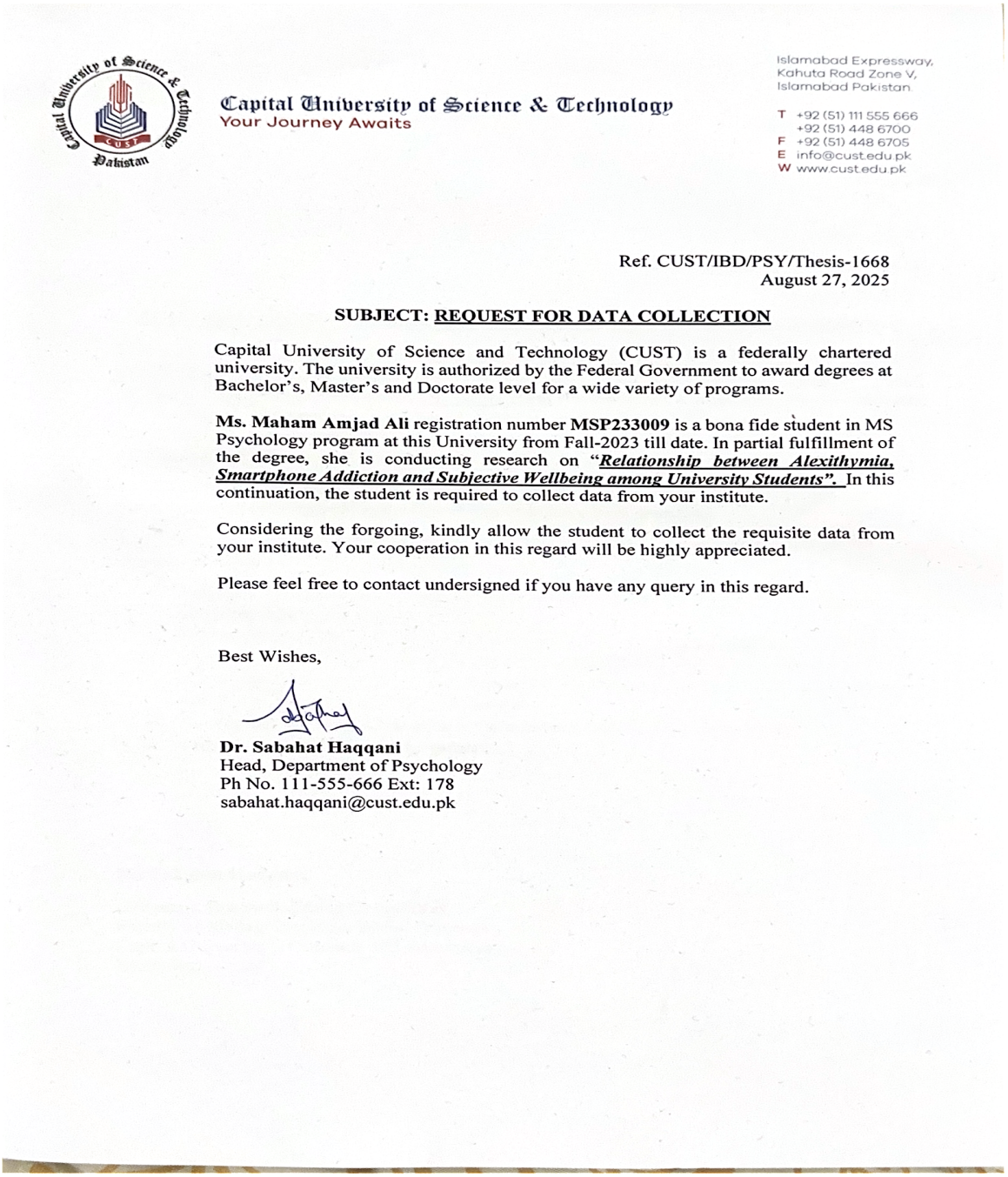
The Scholar is required to notify the Research Ethics Committee in case of any amendment in the project, specifically:

- Any significant change to the project and the reason for that change, including an indication of ethical implications (if any)
- Serious adverse effects on participants and the actions taken to address those effects
- Any other unforeseen events or unexpected developments that merit notification
- The inability of the Principal Investigator to continue in that role, or any other change in research personnel involved in the project
- A delay of more than 12 months in the commencement of the project; and,
- Termination or closure of the project.

Dr. Sabahat Haqqani

Convener, Research Ethics Committee
Faculty of Management and Social Sciences
Capital University of Science and Technology
Islamabad

Appendix B



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Ref. CUST/IBD/PSY/Thesis-1668
August 27, 2025

SUBJECT: REQUEST FOR DATA COLLECTION

Capital University of Science and Technology (CUST) is a federally chartered university. The university is authorized by the Federal Government to award degrees at Bachelor's, Master's and Doctorate level for a wide variety of programs.

Ms. Maham Amjad Ali registration number **MSP233009** is a bona fide student in MS Psychology program at this University from Fall-2023 till date. In partial fulfillment of the degree, she is conducting research on "***Relationship between Alexithymia, Smartphone Addiction and Subjective Wellbeing among University Students".*** In this continuation, the student is required to collect data from your institute.

Considering the forgoing, kindly allow the student to collect the requisite data from your institute. Your cooperation in this regard will be highly appreciated.

Please feel free to contact undersigned if you have any query in this regard.

Best Wishes,

Dr. Sabahat Haqqani
Head, Department of Psychology
Ph No. 111-555-666 Ext: 178
sabahat.haqqani@cust.edu.pk

Appendix C

Smartphone Addition Scale — Short Version

Do you own a smartphone? Yes _____ No _____

If **yes**, please continue. If **no**, skip the rest of this questionnaire.

Please rate each answer according to how true you feel it is for you.

1. I miss work that I planned, due to smartphone use.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

2. I have a hard time concentrating in class, while doing assignments, or while working, due to smartphone use.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

3. I feel pain in my wrists or at the back of my neck while using a smartphone.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

4. I wouldn't be able to stand not having a smartphone.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

5. I feel impatient and fretful when I am not holding my smartphone.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

6. I have my smartphone on my mind even when I am not using it.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

7. I would never give up using my smartphone even if my daily life were greatly affected by it.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

8. I constantly check my smartphone so as not to miss conversations between other people on Twitter, Facebook, Snapchat, Instagram, TikTok, or other social media.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

9. I use my smartphone longer than I intend.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

10. People around me tell me that I use my smartphone too much.

1	2	3	4	5	6
Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

Appendix D

NovoPsych

Toronto Alexithymia Scale (TAS)

Instructions:

Please read each statement and indicate how much you agree or disagree with the statement.

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	I am often confused about what emotion I am feeling.	1	2	3	4	5
2	It is difficult for me to find the right words for my feelings.	1	2	3	4	5
3	I have physical sensations that even doctors don't understand.	1	2	3	4	5
4	I am able to describe my feelings easily.	5	4	3	2	1
5	I prefer to analyze problems rather than just describe them.	5	4	3	2	1
6	When I am upset, I don't know if I am sad, frightened, or angry.	1	2	3	4	5
7	I am often puzzled by sensations in my body.	1	2	3	4	5
8	I prefer to just let things happen rather than to understand why they turned out that way.	1	2	3	4	5
9	I have feelings that I can't quite identify.	1	2	3	4	5
10	Being in touch with emotions is essential.	5	4	3	2	1
11	I find it hard to describe how I feel about people.	1	2	3	4	5
12	People tell me to describe my feelings more.	1	2	3	4	5
13	I don't know what's going on inside me.	1	2	3	4	5
14	I often don't know why I am angry.	1	2	3	4	5
15	I prefer talking to people about their daily activities rather than their feelings.	1	2	3	4	5
16	I prefer to watch "light" entertainment shows rather than psychological dramas.	1	2	3	4	5
17	It is difficult for me to reveal my innermost feelings, even to close friends.	1	2	3	4	5

NovoPsych

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
18	I can feel close to someone, even in moments of silence.	**5**	**4**	**3**	**2**	**1**
19	I find examination of my feelings useful in solving personal problems.	**5**	**4**	**3**	**2**	**1**
20	Looking for hidden meanings in movies or plays distracts from my enjoyment.	**1**	**2**	**3**	**4**	**5**

Developer Reference:

Bagby, R. M., Parker, J. D., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia Scale--I. Item selection and cross-validation of the factor structure. Journal of Psychosomatic Research, 38(1), 23–32. https://doi.org/10.1016/0022-3999(94)90005-1

Administer Now

Appendix E

Subjective Happiness Scale

1. In general, I consider myself:

1	2	3	4	5	6	7
not a very happy person						a very happy person

2. Compared with most of my peers, I consider myself:

1	2	3	4	5	6	7
less happy						more happy

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

1	2	3	4	5	6	7
not at all						a great deal

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

7	6	5	4	3	2	1
not at all						a great deal

Appendix F

CONSENT FORM

Title of Research: Relationship between Alexithymia, Smartphone Addiction and Subjective Wellbeing among University Students.

INTRODUCTION:

My name is Maham Amjad Ali, a student of Capital University of Science and Technology, currently in the final semester of MS Psychology. I am conducting a research study to explore the relationship between alexithymia, smartphone addiction, and subjective well-being among university students in Rawalpindi and Islamabad. This study aims to understand how difficulties in identifying and expressing emotions may lead to excessive smartphone use and how this, in turn, impacts overall well-being. Your participation is entirely voluntary, and you are free to withdraw at any point without any consequences. All the information you provide through the questionnaires will be kept confidential and used solely for research purposes. The survey will take about 10–15 minutes to complete. If you have any questions or feel uncomfortable at any point, you are welcome to discontinue your participation.

Please initial all boxes Before your participation in study:

1. I confirm that I have read and understand the information given for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

3. I understand that data collected during the study, may be looked at by the researchers performing the research. I give permission for these individuals to have access to my interview recording permission

☐

4. I agree to take part in the above study.

☐

Name of Participant	Date	Signature