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SYSTEMATIC REVIEW

Association Between Duration of Digital/Social Media Use, Phubbing Behavior, and Alexithymia in Adolescents and University Students: A Primary Care Perspective

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Abstract

Objective and Aim

The unprecedented expansion of smartphone technologies and social media platforms has profoundly transformed the emotional, interpersonal, and communication experiences of adolescents and university students. Digital media have become deeply integrated into everyday life, influencing identity construction, emotional coping mechanisms, academic communication, entertainment, and social interaction. Contemporary youth spend an average of approximately two to ten hours daily on smartphones, driven by continuous access to information, social networking, and digitally mediated communication. Although smartphones facilitate interaction regardless of time and location, growing evidence suggests that excessive digital engagement may paradoxically weaken emotional connectedness, reduce face-to-face interpersonal interaction, and contribute to psychological vulnerability among younger populations. Alongside these societal changes, increasing scientific attention has focused on two interrelated concepts: alexithymia and phubbing. Alexithymia is characterized by difficulty identifying and expressing emotions together with externally oriented thinking, representing a significant deficit in emotional processing and emotional awareness. Phubbing, defined as ignoring physically present individuals because of excessive focus on smartphones or other digital devices, has emerged as an increasingly prevalent behavioral phenomenon in modern communication patterns. Both constructs appear closely associated with problematic smartphone use, social media dependency, and maladaptive emotional coping behaviors. Emerging evidence suggests that prolonged digital and social media exposure may contribute to emotional fragmentation, attentional disruption, and interpersonal disengagement. Simultaneously, individuals with alexithymic traits may increasingly rely on digitally mediated environments as psychologically safer spaces because such interactions often involve lower emotional demands, reduced interpersonal vulnerability, and greater perceived control.

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In this context, smartphones may function not only as communication tools but also as emotionally compensatory environments used to regulate distress and avoid emotionally demanding face-to-face interactions. The present systematic review aimed to examine the association between duration of digital/social media use, phubbing behavior, and alexithymia among adolescents and university students within a biopsychosocial and primary care framework. Particular emphasis was placed on emotional regulation, interpersonal functioning, family dynamics, and the potential role of primary care systems in the early identification of psychosocial vulnerability in the digital era.

Materials and Methods

This systematic review synthesizes current evidence regarding the association between duration of digital/social media use, phubbing behavior, and alexithymia among adolescents and university students. Electronic databases including PubMed, Scopus, Web of Science, and Google Scholar were reviewed using combinations of the terms “alexithymia,” “phubbing,” “social media addiction,” “screen time,” “smartphone addiction,” “adolescents,” “university students,” and “emotional regulation.” Peer-reviewed studies, meta-analyses, systematic reviews, and longitudinal studies published in English were included. The literature was critically interpreted within a biopsychosocial and primary care framework.

Results

Current evidence demonstrates a strong and consistent association between prolonged digital/social media use and increased phubbing behavior, alexithymic traits, emotional dysregulation, depression, anxiety, loneliness, sleep disturbances, and problematic smartphone-related behaviors among adolescents and university students. Four major thematic domains repeatedly emerged across the literature: smartphone addiction, internet addiction, fear of missing out (FoMO), and nomophobia, all of which appear closely interconnected with emotional processing difficulties and maladaptive coping patterns. Individuals with alexithymic characteristics demonstrate increased vulnerability to excessive smartphone and social media use due to impaired emotional awareness, difficulties identifying and expressing emotions, insecure attachment patterns, social anxiety, boredom proneness, and maladaptive emotion regulation strategies. For these individuals, digitally mediated environments may function as psychologically safer spaces because they involve lower emotional demands, greater perceived control, and reduced interpersonal vulnerability. Phubbing behavior appears to represent both a manifestation of digital dependency and a perpetuating factor of interpersonal emotional disengagement. Repetitive smartphone-focused interactions during face-to-face communication may gradually impair empathic attunement, reflective emotional processing, emotional awareness, and relational competence. Simultaneously, chronic digital immersion may reduce opportunities for sustained interpersonal interaction and emotional learning, thereby contributing to emotional fragmentation and diminished face-to-face communication skills. Importantly, the relationship between digital overuse and alexithymia appears bidirectional and self-reinforcing. Emotional discomfort, unrecognized affective states, and psychosocial distress may increase reliance on smartphones and social media as compensatory coping environments, while persistent digital dependency and phubbing behaviors may further impair emotional awareness, relational connectedness, and psychological well-being over time.

Conclusion

Digital media overuse, phubbing behavior, and alexithymia appear to constitute an interconnected, multidimensional, and bidirectional psychosocial system associated with depression, anxiety, loneliness, sleep disturbances, somatic complaints, and reduced psychological well-being among adolescents and university students.

Excessive digital and social media exposure may contribute to emotional fragmentation, impaired emotional awareness, and relational disengagement by reducing opportunities for sustained face-to-face interaction and reflective emotional processing. At the same time, individuals with alexithymic traits may preferentially seek digitally mediated communication environments because these platforms involve lower emotional demands, greater perceived control, and reduced interpersonal vulnerability. In this context, smartphones increasingly function not only as communication devices but also as emotionally compensatory environments used to avoid emotional discomfort, social anxiety, and emotionally demanding interpersonal interactions. Phubbing behavior represents a particularly important behavioral manifestation within this cycle, reflecting both attentional fragmentation and interpersonal emotional disengagement. Persistent engagement with smartphones during face-to-face interactions may gradually weaken empathic communication, emotional attunement, and relational connectedness. Furthermore, family dynamics, especially parental phubbing behaviors, appear to significantly influence emotional development, attachment security, and problematic internet use among adolescents, suggesting an intergenerational transmission of digitally mediated emotional disengagement. From a primary care perspective, the integration of digital behavior assessment and emotional literacy evaluation into routine adolescent and young adult healthcare may facilitate earlier recognition of psychosocial vulnerability and emerging emotional dysregulation. Preventive and therapeutic strategies should therefore emphasize emotional awareness, healthy interpersonal communication, balanced digital habits, and family-centered interventions aimed at strengthening emotional connectedness in the digital era.

Keywords: Alexithymia, Phubbing, Social Media Use, Smartphone Addiction, Adolescents, University Students, Emotional Regulation, Primary Care.

1. Introduction

Over the last two decades, digital technologies have profoundly altered the structure of human communication and emotional interaction. Smartphones, social media platforms, instant messaging applications, and algorithm-driven digital environments have become inseparable components of modern daily life. Adolescents and university students represent the most digitally immersed populations worldwide, spending substantial portions of their daily lives interacting with screens, social networking platforms, and virtual environments. Although digital technologies provide undeniable advantages in communication, accessibility, education, and social connectivity, increasing evidence suggests that excessive and maladaptive digital engagement may contribute to emotional dysregulation, impaired social functioning, psychological distress, and relational disconnection[1–3]. The transition from face-to-face communication toward digitally mediated interaction has created an unprecedented psychosocial environment in which emotional expression is increasingly compressed into brief text messages, emojis, reactions, visual filters, and curated online identities. One of the most visible manifestations of this transformation is phubbing, defined as the act of ignoring physically present individuals in favor of smartphone interaction[1]. Initially conceptualized as a socially disruptive behavior, phubbing has gradually evolved into a normalized communication pattern within contemporary digital culture. What was once considered socially inappropriate has increasingly become accepted in classrooms, family environments, friendships, romantic relationships, and even professional settings. Importantly, phubbing reflects more than simple distraction. It represents a disruption of emotional presence and interpersonal attunement. Human communication requires sustained attention, emotional responsiveness, empathic engagement, and relational reciprocity. Smartphone-related attentional fragmentation interferes with

these processes, gradually weakening interpersonal connectedness and emotional synchrony. At the same time, increasing attention has been directed toward alexithymia as a potential psychological vulnerability factor associated with problematic digital behavior. Alexithymia refers to difficulty identifying feelings, difficulty describing feelings, reduced emotional awareness, and externally oriented cognitive processing[4,5]. Individuals with alexithymic traits frequently struggle to recognize and verbalize internal emotional experiences, often demonstrating impaired emotional regulation, somatization, interpersonal difficulties, and psychological distress. The relationship between alexithymia and digital behavior appears increasingly complex and bidirectional. Adolescents and university students who struggle to identify or express emotions may preferentially seek digital environments because online communication reduces emotional intensity, interpersonal unpredictability, and vulnerability. Smartphones provide psychologically controllable environments where communication can be delayed, edited, filtered, or interrupted without immediate emotional confrontation. Conversely, chronic immersion in digitally mediated interaction may itself contribute to emotional detachment. Emotional development during adolescence and emerging adulthood depends heavily on repeated face-to-face interaction, emotional mirroring, empathy development, and reflective interpersonal experiences. Excessive screen exposure may reduce opportunities for these developmental processes, contributing to diminished emotional awareness and relational depth. An important aspect of contemporary digital culture is that smartphones increasingly function not merely as communication devices but as emotional regulation tools. Many adolescents and university students instinctively turn toward screens when experiencing boredom, loneliness, stress, uncertainty, social discomfort, or emotional confusion. Scrolling through social media feeds, watching short videos, gaming, or continuously checking notifications may temporarily distract individuals from internal distress. In this sense, digital behavior often represents a psychologically accessible escape from emotional discomfort. Individuals who cannot adequately identify or verbalize emotions may experience internal tension without fully understanding its source. Smartphones provide rapid distraction and immediate stimulation that temporarily alleviates emotional unease while simultaneously avoiding deeper emotional processing. This dynamic closely aligns with the compensatory internet use model, which proposes that problematic digital behavior often emerges as a maladaptive coping strategy intended to regulate psychosocial distress rather than solely reflecting addictive tendencies[6]. Digital environments therefore function as emotionally compensatory spaces that provide temporary relief while potentially reinforcing emotional avoidance patterns over time. The psychosocial implications of these developments are particularly important for primary care physicians. Adolescents and university students affected by emotional dysregulation and problematic digital behavior frequently present in primary care settings with nonspecific somatic symptoms, sleep disturbances, fatigue, concentration difficulties, headaches, gastrointestinal complaints, anxiety symptoms, or depressive manifestations. However, the underlying emotional and interpersonal dimensions often remain insufficiently explored. Given the central role of family medicine within preventive healthcare and biopsychosocial assessment, understanding the intersection between digital media use, phubbing behavior, and alexithymia has become increasingly necessary. The present review aims to provide a comprehensive evaluation of current evidence regarding these interconnected phenomena among adolescents and university students from a primary care perspective.

2. Material and Methods

This study employed a narrative review and conceptual synthesis design to examine the

relationship between duration of digital and social media use, phubbing behavior, and alexithymia among adolescents and university students. The aim was to integrate empirical findings and theoretical perspectives within a biopsychosocial primary care framework, focusing on emotional regulation, interpersonal functioning, and behavioral outcomes in the context of increasing digitalization. A comprehensive literature search was conducted using four major electronic databases: PubMed, Scopus, Web of Science, and Google Scholar. The search strategy included combinations of relevant keywords such as alexithymia, phubbing, smartphone addiction, social media use, screen time, adolescents, university students, emotional regulation, and internet addiction. These terms were selected to capture both emotional processing constructs and digital behavior patterns in youth populations. Studies were considered eligible for inclusion if they were peer-reviewed articles published in English and focused on adolescents or young adults, including university student populations. Both observational and analytical study designs were included, specifically cross-sectional studies, longitudinal cohort studies, systematic reviews, and meta-analyses. This approach was intended to ensure a broad and comprehensive synthesis of existing evidence across different methodological levels. Studies were excluded if they were not peer-reviewed, did not involve adolescent or young adult populations, or failed to report outcomes related to emotional functioning, psychological distress, or behavioral aspects of digital media use. Purely descriptive reports without psychological or behavioral relevance were also excluded to maintain conceptual consistency. The extracted data were synthesized using a thematic analysis approach guided by a biopsychosocial framework. This allowed for the integration of biological, psychological, and social dimensions of digital media use and emotional processing. The synthesis particularly focused on identifying recurring patterns linking digital exposure, phubbing behavior, and alexithymia, as well as their shared associations with mental health outcomes in youth populations.

3. Historical Development and Conceptualization of Alexithymia

The concept of alexithymia was first introduced within psychosomatic medicine in the early 1970s to describe patients who demonstrated pronounced difficulty identifying and verbalizing emotional experiences[4]. These individuals frequently expressed emotional distress through somatic complaints rather than psychological language, leading clinicians to recognize a distinctive deficit in emotional awareness and communication. Over time, alexithymia evolved from a narrowly psychosomatic concept into a broader multidimensional psychological construct. Contemporary models define alexithymia through four principal dimensions: difficulty identifying feelings, difficulty describing feelings, externally oriented thinking, and reduced imaginative or fantasy processes[7]. The development of the Toronto Alexithymia Scale (TAS-20) represented a major advancement in alexithymia research by providing a psychometrically validated instrument capable of assessing emotional awareness deficits across diverse populations[5,8]. The TAS-20 remains the most widely used measure in both clinical and research settings and has facilitated substantial expansion of alexithymia literature during recent decades. Alexithymia is increasingly recognized as a transdiagnostic vulnerability factor associated with depression, anxiety disorders, somatization, addictive behaviors, eating disorders, interpersonal dysfunction, trauma-related symptoms, and emotional dysregulation[9]. Importantly, alexithymia does not simply reflect emotional suppression. Rather, it involves fundamental impairments in emotional identification, differentiation, interpretation, and symbolic representation. Individuals with alexithymic traits frequently describe physical sensations without understanding their emotional significance. Emotional experiences may therefore remain undifferentiated and confusing, contributing

to chronic internal tension, maladaptive coping strategies, and impaired interpersonal functioning. Recent evidence additionally suggests that alexithymia may involve neurocognitive disturbances in emotional processing, interoceptive awareness, and affective integration[10]. Emotional recognition deficits appear to significantly contribute to internalizing symptoms among adolescents and young adults[11]. Difficulty recognizing emotions in oneself often parallels reduced sensitivity to emotional cues in others, thereby impairing empathic communication and relational intimacy. The question of whether alexithymia represents a stable personality trait or a state-dependent condition remains actively debated. Longitudinal evidence suggests moderate temporal stability while simultaneously demonstrating sensitivity to psychosocial stressors and environmental influences[12]. This perspective is particularly relevant within contemporary digital environments, where chronic overstimulation and emotionally superficial communication may influence emotional development.

4. Adolescence, Emerging Adulthood, and Emotional Vulnerability

Adolescence and emerging adulthood represent critical developmental periods characterized by emotional maturation, identity formation, increasing autonomy, peer integration, and neurobiological development. Emotional awareness, self-reflection, interpersonal communication, and social belonging are central developmental tasks during these stages. At the neurodevelopmental level, adolescence involves ongoing maturation of brain regions associated with executive functioning, emotional regulation, impulse control, and social cognition. Simultaneously, adolescents experience heightened sensitivity to peer evaluation, social belonging, and reward processing. Digital technologies have become deeply embedded within these developmental processes. Contemporary adolescents and university students often experience social interaction, identity construction, validation, and emotional expression primarily through digital platforms. Social media environments continuously expose users to comparison, performance-based self-presentation, algorithmic reinforcement, and social evaluation. Although digital connectivity may initially enhance perceived social integration, excessive digital immersion may paradoxically contribute to loneliness, social anxiety, emotional fragmentation, and relational dissatisfaction. Adolescents increasingly communicate continuously while simultaneously experiencing reduced emotional intimacy and face-to-face connectedness. This paradox is especially relevant for individuals with alexithymic traits. Difficulty interpreting emotional states may increase dependency on external validation mechanisms such as likes, notifications, follower counts, and digital feedback. Digital environments provide rapid reassurance without requiring sustained emotional vulnerability. The emotional architecture of social media platforms further intensifies this process. Platforms are intentionally designed to maximize engagement through intermittent rewards, novelty exposure, and attentional capture. Emotional discomfort can therefore be rapidly interrupted through continuous digital stimulation. For many adolescents and university students, checking smartphones becomes an automatic response to boredom, uncertainty, stress, loneliness, or emotional discomfort. Rather than processing emotional experiences internally or interpersonally, individuals increasingly externalize emotional regulation through digital distraction.

5. Phubbing and the Normalization of Emotional Absence

Phubbing has become one of the defining interpersonal behaviors of contemporary digital culture. Although often dismissed as a minor social annoyance, growing evidence suggests that phubbing represents a deeper disruption of emotional presence and relational attentiveness[1,13,14]. Human relationships depend on attentional reciprocity. Eye contact, emotional responsiveness, facial expression

recognition, silence tolerance, empathic listening, and sustained interpersonal attention are fundamental components of emotional communication. Smartphones interfere with these processes by continuously competing for attentional resources. Importantly, phubbing behaviors are increasingly normalized within families, classrooms, friendships, and romantic relationships. Repeated exposure gradually reshapes social expectations, reducing sensitivity to interpersonal disengagement. Adolescents and university students frequently maintain simultaneous engagement with both physical and digital environments without fully participating in either. This fragmented attention weakens emotional synchrony between individuals. Emotional attunement requires uninterrupted presence; however, smartphone interruptions repeatedly disrupt emotional flow and relational continuity. Studies demonstrate that phubbing negatively affects friendship satisfaction, relationship quality, interpersonal trust, empathy, and communication effectiveness[15–17]. Phubbing has additionally been associated with depressive symptoms, loneliness, social exclusion, burnout, and reduced psychological well-being[15,18,19,20]. From a psychological perspective, phubbing may function as an avoidance-based coping strategy. Direct interpersonal interaction involves unpredictability, vulnerability, emotional exposure, and potential rejection. Smartphones offer psychologically safer alternatives that reduce emotional demands while providing continuous stimulation and perceived connectedness. Individuals with alexithymic traits may be especially susceptible to phubbing behaviors because digitally mediated communication minimizes emotional complexity. Online interaction allows delayed responses, emotional filtering, selective self-presentation, and reduced exposure to emotionally intense interpersonal situations. Over time, however, repeated avoidance of emotionally demanding interpersonal experiences may further impair emotional communication skills, empathy development, and reflective functioning.

6. Digital Media Use and Alexithymia: A Bidirectional Relationship

A growing body of evidence supports a bidirectional relationship between alexithymia and problematic digital behavior[21-26]. Individuals with alexithymic traits appear more likely to engage in excessive smartphone use, problematic social media behaviors, internet addiction symptoms, and phubbing behaviors. Several mechanisms may explain this relationship. First, digitally mediated interaction reduces emotional immediacy and interpersonal complexity. Face-to-face communication requires rapid emotional interpretation, nonverbal cue processing, and spontaneous emotional responsiveness. These demands may feel overwhelming for individuals with impaired emotional awareness. Second, smartphones provide temporary relief from internal distress through distraction, novelty exposure, and reward stimulation. Emotional discomfort that cannot be adequately processed may therefore be externally regulated through digital engagement. Third, social media platforms provide externally measurable indicators of social approval and belonging. Individuals struggling with internal emotional awareness may become increasingly dependent on external validation systems to regulate self-esteem and social identity. At the same time, excessive digital immersion may progressively impair emotional awareness itself. Continuous exposure to fragmented information streams, abbreviated communication formats, and rapid attentional shifts may reduce opportunities for introspection, emotional reflection, and sustained interpersonal engagement. Digital environments frequently prioritize speed, stimulation, visibility, and reaction rather than emotional depth or reflective communication. Emotional experiences become increasingly externalized into performative digital expressions rather than internally processed experiences. Consequently, adolescents and university students may gradually lose familiarity with their own emotional experiences. Many young individuals report feeling emotionally overwhelmed,

disconnected, or psychologically exhausted while simultaneously struggling to identify the specific nature of their distress. This phenomenon reflects an important paradox of contemporary digital life: constant communication does not necessarily produce emotional connectedness. Instead, excessive digital engagement may coexist with increasing emotional loneliness and reduced self-awareness.

7. Proposed Screening Algorithm and Risk Stratification Model

Within the primary care context, the assessment of digital media–related emotional dysregulation requires a structured yet pragmatic approach that integrates behavioral, emotional, and psychosocial domains into a unified clinical decision pathway. The proposed screening algorithm is designed as a stepwise model beginning with the quantification of digital exposure, followed by the identification of maladaptive interaction patterns (phubbing behavior), and culminating in the evaluation of emotional processing capacity, particularly alexithymic traits. In the first stage, clinicians assess duration and intensity of digital/social media use, including daily screen time, nocturnal smartphone use, and compulsive checking behaviors, as these variables serve as proximal indicators of digital dependency risk. The second stage focuses on behavioral manifestations of attentional fragmentation, primarily phubbing, which reflects reduced interpersonal presence and impaired relational engagement during face-to-face interactions. The third stage evaluates emotional awareness and expression difficulties using validated tools such as the Toronto Alexithymia Scale (TAS-20), alongside clinical indicators such as difficulty identifying feelings, limited emotional vocabulary, and somatic substitution of emotional states[5,9]. These three domains collectively inform a risk stratification model that categorizes individuals into low, moderate, high, and severe risk groups. In the low-risk category, individuals demonstrate controlled digital use, preserved emotional awareness, and intact interpersonal engagement, requiring only preventive psychoeducation. The moderate-risk group is characterized by increased screen time and intermittent phubbing behaviors without significant functional impairment, where early behavioral counseling and digital hygiene interventions are indicated. The high-risk category includes individuals presenting with combined phubbing behavior and elevated alexithymia traits, often accompanied by depressive, anxious, or somatic symptoms; this group requires structured psychosocial intervention, emotional literacy training, and potentially brief psychological therapy within or alongside primary care. The severe-risk group encompasses patients with marked functional impairment, comorbid psychiatric symptoms, and entrenched digital dependency patterns, necessitating multidisciplinary management including mental health referral. Importantly, this integrated model emphasizes a dynamic and bidirectional interpretation of risk, acknowledging that digital overuse may both reflect and amplify underlying emotional processing deficits. Therefore, risk stratification is not conceptualized as a static classification but as a continuum in which individuals may shift between categories depending on psychosocial context, developmental stage, and environmental stressors. This combined algorithm and stratification framework provides a clinically applicable tool for early identification, preventive intervention, and longitudinal monitoring of digital-era emotional dysregulation within primary care settings (Table 1).

Table 1: Risk Stratification Model

Risk Level	Characteristics	Clinical Action
Low	Normal screen use, intact emotional awareness	Health education
Moderate	Increased screen time + mild phubbing	Behavioral counseling
High	Phubbing + alexithymia + distress symptoms	Structured intervention
Severe	Functional impairment + depression/anxiety	Multidisciplinary care

8. Family Dynamics, Parental Phubbing, and Emotional Development

Family interaction patterns play a central role in emotional development during adolescence. Emotional awareness, self-regulation, and interpersonal communication skills develop primarily through repeated interactions with caregivers and family members. Parental phubbing has therefore emerged as an important area of investigation within recent literature[27-30]. Parents who frequently prioritize smartphone engagement over face-to-face interaction may unintentionally communicate emotional unavailability, reduced attentiveness, and relational disengagement. Children and adolescents exposed to chronic parental distraction may experience diminished emotional validation and reduced opportunities for empathic interaction. Emotional communication within families gradually becomes fragmented, superficial, or inconsistent. Evidence indicates that parental phubbing contributes to adolescent loneliness, emotional dysregulation, problematic internet use, social withdrawal, and impaired psychological adjustment[27,29,30]. Importantly, adolescents frequently model parental digital behaviors, internalizing phubbing as a normative interpersonal communication pattern. This intergenerational transmission of digitally fragmented communication may contribute to broader societal changes in emotional interaction. Emotional presence increasingly competes with technological distraction, reducing opportunities for sustained relational engagement. Family-centered interventions aimed at restoring emotionally attentive communication and healthy digital boundaries may therefore represent important preventive strategies within primary care settings.

9. Mental Health Consequences

The convergence of excessive digital media use, phubbing behavior, and alexithymia contributes to multiple adverse mental health outcomes among adolescents and university students. Depression represents one of the most consistently associated conditions[9,18-20,25,31]. Emotional dysregulation, impaired interpersonal connectedness, social comparison, fear of missing out, sleep disruption, and emotional avoidance collectively contribute to depressive symptomatology. Anxiety symptoms, particularly social anxiety, additionally appear strongly linked to problematic digital behavior[24,26,32]. Individuals uncomfortable with face-to-face interaction may increasingly rely on digital communication, thereby avoiding opportunities to develop adaptive interpersonal coping skills. Somatization also represents an important clinical manifestation. Adolescents and university students with alexithymic traits frequently present with headaches, gastrointestinal symptoms, fatigue, palpitations, dizziness, or medically unexplained symptoms. Emotional distress that cannot be verbally processed may instead emerge through bodily expression. Sleep disturbances constitute another significant consequence of excessive digital behavior. Nighttime smartphone use disrupts circadian rhythm regulation, reduces sleep quality, increases cognitive overstimulation, and impairs emotional resilience. Additionally, chronic digital overstimulation may contribute to attentional fragmentation, reduced concentration capacity, cognitive fatigue, and diminished reflective functioning. Adolescents increasingly report difficulty tolerating silence, boredom, or uninterrupted attention without digital stimulation. Collectively, these findings suggest that problematic digital behavior is not simply a behavioral habit but part of a broader psychosocial process involving emotional regulation, interpersonal functioning, identity development, and psychological vulnerability.

10. Primary Care Implications and Preventive Approaches

Primary care physicians occupy a unique position in identifying emotional vulnerability and problematic digital behavior among adolescents and university students. Family medicine emphasizes

continuity of care, biopsychosocial assessment, preventive intervention, and family-centered approaches, making it particularly well suited for addressing these emerging challenges. Routine clinical evaluation should increasingly include assessment of screen time duration, nighttime smartphone use, social media habits, sleep quality, interpersonal functioning, emotional awareness, and family communication patterns. Importantly, clinicians should recognize that excessive smartphone use may represent an underlying emotional coping strategy rather than simple recreational behavior. Adolescents presenting with recurrent somatic complaints, emotional exhaustion, irritability, concentration difficulties, or psychosocial distress should be assessed for alexithymic traits and maladaptive digital coping patterns. The TAS-20 remains a practical and validated instrument for assessing alexithymia in both research and clinical contexts[5,8]. Early identification of emotional awareness deficits may facilitate preventive intervention before more severe psychological morbidity develops. Preventive strategies should prioritize emotional literacy education, reflective functioning, empathic communication skills, face-to-face social interaction, and healthy digital boundaries. Schools and universities may benefit from integrating emotional awareness programs into educational curricula. Family-centered interventions are equally important. Encouraging device-free family interaction periods, emotionally attentive communication, and parental modeling of balanced digital behavior may strengthen emotional connectedness within households. Importantly, interventions should avoid demonizing digital technology itself. Smartphones and social media are integral components of modern life and provide substantial educational, social, and communicative benefits. The primary objective should therefore focus on promoting balanced digital engagement while preserving emotional depth, interpersonal presence, and psychological well-being.

11. Future Directions

Despite rapidly expanding literature, several important gaps remain. Most existing studies are cross-sectional, limiting causal interpretation regarding the relationship between alexithymia and problematic digital behavior. Longitudinal and developmental studies are necessary to clarify temporal relationships and neurodevelopmental consequences. Cross-cultural investigations are additionally important because emotional expression, family dynamics, digital behavior patterns, and social norms vary substantially across societies. Future research should also investigate whether interventions targeting emotional literacy, reflective functioning, and interpersonal communication can reduce problematic smartphone use and phubbing behaviors. The growing integration of artificial intelligence, immersive digital environments, and algorithm-driven communication systems may further intensify emotional and relational challenges among future generations. Understanding how digital environments shape emotional development therefore represents an increasingly urgent public health priority.

12. Conclusion

The association between duration of digital/social media use, phubbing behavior, and alexithymia represents an increasingly significant psychosocial and public health concern among adolescents and university students. Excessive digital engagement appears closely linked to emotional dysregulation, impaired emotional awareness, interpersonal disconnection, depressive symptoms, anxiety, loneliness, somatization, and reduced psychological well-being. Smartphones increasingly function not only as communication tools but also as emotionally compensatory environments that provide temporary escape from emotional discomfort and interpersonal vulnerability. The relationship between alexithymia and problematic digital behavior appears multidimensional and self-reinforcing. Individuals with alexithymic traits may preferentially seek digitally mediated interaction because of reduced emotional demands, while chronic digital

immersion and phubbing behaviors may further impair emotional processing and interpersonal connectedness. Contemporary adolescents and university students are growing up within environments characterized by continuous digital stimulation yet increasing emotional fragmentation. Constant communication paradoxically coexists with reduced emotional presence, diminished relational depth, and growing difficulty articulating internal emotional experiences. From a primary care perspective, integrating emotional literacy assessment and digital behavior evaluation into routine healthcare is becoming increasingly necessary. Family physicians play a critical role in early identification, preventive counseling, family-centered intervention, and the promotion of healthier emotional development within the digital era.

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Conflict of interest

The author declare no conflict of interest.

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