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Unveiling the Digital Dilemma: Understanding Problematic Smartphone and Social Media Usage among Adults in France

Laurent Karila, nathaniel Scher, Clement Draghi, Delphine Lichte, Ilan Darmon, Hanene Boudabous, Hanah Lamallem, Olivier Bauduceau, Marc Bollet, Alain Toledano

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Abstract

Background: The EVADD study (EVAluation of Digital aDdiction) investigates problematic smartphone use in the digital age, as global users hit 55.88 million in 2023.

Objective: It focuses on increased screen time from digital devices, especially smartphones, highlighting adult usage issues.

Methods: Employing a cross-sectional, non-probability sample design, the EVADD study was conducted from May 3rd to June 5th, 2023 and utilized the Smartphone Compulsive Use Test to assess participants' compulsive smartphone use. Participants were recruited through the French mutual insurance company PRO-BTP. Anonymously collected data encompassed social network engagement, electronic device ownership, and daily leisure time spent on devices through an online questionnaire.

Results: In a study with 21,244 respondents (average age 53, 48% women), most were retirees or employees, predominantly married or in a couple, with over half owning 2 or 3 devices, primarily smartphones and laptops. A significant 70% considered smartphones indispensable. The Smartphone Compulsion Test revealed 66.7% exhibited compulsive use, and 38% showed clear addiction signs, especially younger participants. Leisure time on screens averaged 1-2 hours, with notable habits like using smartphones in the bathroom (36%) and before sleep (43%). Problematic behaviors included unsafe driving and high engagement with social networks, particularly Facebook, without active participation.

Conclusions: The EVADD study illuminates the complex relationship between adults and smartphones, underscoring the risks of excessive use. It reveals how these behaviors affect daily life, sleep patterns, and driving safety. While identifying a spectrum of social network use from habitual to potentially addictive, the study aims to inform preventive strategies and therapeutic interventions rather than pathologize everyday activities. Ultimately, it advocates for heightened awareness and education to mitigate health risks associated with problematic smartphone usage.

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KEYWORDS: Problematic smartphone use, Digital mental health, Compulsive behavior, Social network addiction, Nomophobia, Phubbing, Screen time effects, Public health interventions

Introduction

The term "digital" encompasses the utilization of digital technology for communication through intangible devices. This includes activities such as browsing social networks, playing video games, or engaging in online gambling using computers, smartphones, and tablets.

The proliferation of screens is a relatively recent phenomenon, with the global number of smartphone users estimated to have reached 55.88 million in 2023, marking a doubling since 2013 [1]. Screen selection is often dictated by various contexts, including sedentary lifestyles, mobility, and personal or professional use. Consequently, the time spent on screens, known as screen time, has witnessed a steady increase over the years. This trend has contributed to a notable rise in the prevalence of excessive screen behavior among individuals across age groups, including children, adolescents, and adults [2].

Problematic smartphone use (or what we name smartphonoholism) is characterized by three primary consumption problems: addictive consumption habits (e.g., symptoms of addiction), antisocial consumption patterns (e.g., prohibited use) and adverse usage patterns (e.g., phone use while driving, going to the toilets or to bed with smartphone), leading to a negative impact on academic, professional, and/or social functioning. This negative influence can manifest in disrupted interpersonal relationships, social withdrawal due to limited face-to-face contact, and an increased preference for solitary activities over group interactions. While smartphone addiction does not equate to substance or gambling addiction, screens can indeed foster addictive processes through activities like video gaming, social networking, and engaging in sexual content [3].

The emergence of a new digital clinical terminology has accompanied the rise in smartphone usage. "Nomophobia" (NoMO) describes the compulsive and time-consuming use of smartphones, accompanied by anxiety when the device is unavailable, "ringxiety" (repeatedly checking for messages, sometimes resulting in false alerts), a constant need for availability, a preference for mobile communication over face-to-face interaction, and financial issues linked to mobile use. "Fear of Missing Out" (FoMO) drives attentional distraction as individuals seek to be part of positive online experiences depicted in others' content [4]. NoMO and FoMO would lead to a need of constant contact with others and reinforce the use of smartphones. "Phubbing," a blend of "phone" and "snubbing," refers to ignoring others by focusing on one's phone during social interactions. "Athazagoraphobia" encompasses the fear of forgetting or being forgotten, while "Smombie," a contraction of "smartphone zombie," describes individuals walking while absorbed in their phones, oblivious to their surroundings. These behaviors often result in compulsive checking of messages or social networks [6].

Research has highlighted the fine line between habitual, non-problematic use of social networks and potentially addictive behavior. Users exhibiting symptoms and consequences akin to substance addiction, such as salience, mood changes, tolerance, craving, withdrawal, and relapse, may indeed be addicted to social networks. Our objective is not to pathologize everyday behaviors excessively but to gather valuable insights that can help prevent risky behaviors and provide support for those in need of therapeutic intervention [7].

In this study, we aimed to evaluate the extent and impact of problematic smartphone and social network usage among adults, investigating whether excessive use could contribute to a new form of dematerialized digital pandemic affecting adolescents and adults alike.

Methods

Study Design and Participants:

The EVADD study (EVAluation of Digital aDdiction) employed a cross-sectional design with a non-probability sample, conducted from May 3rd to June 5th, 2023. Ethical approval was obtained from the Ethic and Scientific Committee South-East I under the reference number 23.00519.000257 – 2023-A00312-43.

A total of 800,000 members of the French mutual insurance company PRO-BTP were invited to participate via email. The email provided information about the survey's objectives, contents, and confidentiality protections, along with access to a completely anonymous online questionnaire through a provided link. Upon clicking the link, participants were automatically redirected to a web platform hosted by the researchers, where they could complete the questionnaire anonymously. No personal data such as email or IP addresses were collected. Participants were required to be at least 18 years old and proficient in French; no other eligibility criteria were applied. The study followed the CROSS checklist for reporting survey studies, as recommended by the EQUATOR network. Considering an expected response rate of 1-5% among PRO-BTP members, corresponding to 8,000 to 40,000 responses, a sample size of 16,302 participants was determined necessary to achieve a reliable representation of PRO-BTP members with a 99% confidence interval and a 1% error margin.

Participant characteristics collected included age, sex, socio-professional category, education level, and family status. Age was categorized into three groups: 18-39 years, 40-59 years, and ≥ 60 years. Socio-professional categories were classified into eight groups based on the French National classification system.

Measures:

Data were obtained through a combination of a standardized test and author-formulated questions. The primary outcome measure was the degree of participants' smartphone compulsive use, assessed using the Smartphone Compulsive Use Test score[8].The degree of participants' compulsive smartphone use was evaluated using the Smartphone Compulsive Use Test, consisting of 15 yes/no questions. Scores indicated normal behavior (1-2 yes), leaning towards excessive use without problems (3-4 yes), problematic or compulsive use (5 or above), and obvious behavioral addiction (8 or higher). Four yes-no questions related to smartphone use while driving, 10 related to

nomophobia, and athazagoraphobia, phubbing and smombies were evaluated by one question each.

The fact to go the toilets or to bed with a smartphone or tablet were to be answered by never, rarely, often, and always.

Participants were queried about their social network usage frequency and types of networks utilized. Five yes-no questions related to the activity on networks, and 5 others, to be answered by never, rarely, often, and always, related to a possible problem with networks use.

Participants reported the number and types of electronic devices they owned (smartphone, tablet, laptop, desktop, game console) and their primary usage social network, messaging, SMS, emails, TV-series seasons, videogames, on-line gambling). Daily leisure time spent on these devices was also estimated.

Statistical Analysis:

Descriptive statistical analyses were performed using R software version 4.2. Categorical variables were presented as frequencies and percentages, while continuous variables were described using means and standard deviations (SD). The number of missing data for each parameter was reported. Median compulsion scores were compared across age groups and digital activities using appropriate statistical tests such as Kruskal-Wallis or Mann-Whitney-Wilcoxon tests.

Results

Overall, 21 244 persons (2.7% of the solicited panel) responded to all or parts of the questionnaire. there overall characteristics are showed Table 1. Their mean age was 53 ± 15 years and 48% were women. The majority of participants were retirees or employees, and 72% were married or lived in couple. More than 50% of participants had 2 or 3 devices, mainly smartphones and laptops. The favorite device was the smartphone, and 70% participants admitted that they could no longer do without it (see supplementary material).

Among the participants, 12 034 answered the Smartphone Compulsion Test. The positive answers by item are displayed in Table 2. The proportion of participants with a score ≥ 5 was 66.7% (8 025 responders, 95%IC 65.9 – 67.5); the overall mean number of positive responses was 6.4 ± 3.6, with 38% participants (4569; 95%IC 37%-39%) having a score of 8 or more, i.e., having an obvious addiction (Table 3). The percentage of participants according to the total number of positive responses by age class is displayed figure 1. The highest scores were seen in the youngest class of age: 57% of participants less than 40 had a score of 8 or more. Around 45% of participants spent 1 – 2 hours of their leisure time on screens; 36% acknowledged going often or always to the toilets with their smartphone, and 43% going to bed with it, although only 15% said they felt asleep with it (Table 4). The problematic use of smartphone is displayed Table 5. Unsafe driving habits were

reported by less than half of participants, and 14% reported sending messages while driving. Nomophobia signs were mainly the anxiety of not having the smartphone or having forgotten it, and having one's whole life in the smartphone, as "a mental USB key". Phubbing (14% of participants) and smombies (11% of participants) were less recognized. The median compulsion scores were analysed according to activities with devices (Table 4) and to smartphone use or overuse (Table 5). The median compulsory scores increased with the increasing of activities with devices; these scores were at least greater than 7 with the overuse of phones, whether relative to driving, nomophobia, athazagoraphobia, phubbing or smombie.

Table 6 summarizes the answers about social networks. Fifty-seven percent (57%) participants used social networks, mainly Facebook. Logging-in to simply watch, without making comments, was reported by 70% participants, and 57% would simply scroll through news feed without really paying attention. However, 40% participants thought spending too much time of social medias. Questions relative to a problematic use of social networks were answered by less than 5000 participants, and generally acknowledged as not being a problem.

Discussion

Our EVADD study offers valuable insights into the various characteristics associated with frequent smartphone use, which has become a cornerstone of multitasking activities in modern life. By examining the problematic and potentially addictive aspects of this trend, we surveyed a significant sample of 21,244 adults in France, with an average age of 53 ± 15 years, of whom 48% were women. This study stands as a pioneering effort in France, shedding light on a topic of growing concern.

In our cohort, smartphones emerged as the most widely used and seemingly indispensable digital tools, closely followed by laptops. The ubiquity of smartphones in contemporary society reflects not only their practical utility but also the societal pressure to possess one. With their ever-expanding range of services and functions, smartphones have seamlessly integrated into our daily lives, becoming an essential part of our existence.While individuals appreciate the convenience of smartphone ownership for tasks such as accessing information, engaging in virtual communication, and participating in online forums, it is crucial to acknowledge the emergence of problematic smartphone use as a clinical reality[9].

Despite the practical benefits, excessive screen time has become a prevalent issue, with 44% of our cohort spending more than 1.5 hours a day on screens. Notably, 45% of respondents devote all their free time to screen activities, indicating a significant shift in leisure habits.

The Covid-19 lockdown further exacerbated concerns about screen time, particularly among children, as evidenced by a study conducted by the French Public Health Agency. Almost 25% of

respondents reported spending 7 hours a day, or even longer, on screens. Increased screen time, especially among young, educated individuals and urban dwellers, underscores the need for a nuanced understanding of its impact on physical and psychological well-being. However, it is essential to note that while screen time is a factor, its correlation with problematic smartphone use remains inconclusive.[10].

In recent years, the duration of screen exposure, or "screen time", has seen a significant uptick. Our study reveals that 44% of the participants engage with screens for over 1.5 hours daily, with a subset exceeding 3 hours. Notably, 45% of this cohort dedicates their entire leisure time to screen-based activities. Parental concern regarding children's screen time has escalated, a sentiment echoed by a study from the French Public Health Agency. This study highlighted a marked rise in average screen time during the Covid-19 pandemic, with nearly a quarter of the subjects reporting screen engagement for 7 hours or more per day.This increase was predominantly observed among the youth, individuals with higher education levels, those working from home during the lockdown, and residents of urban areas [9]. Furthermore, a recent investigation indicated that individuals with a pronounced inclination towards smartphone usage, termed "smartphonoholics", exhibit a higher propensity to consume video content on their devices, thereby accruing more screen time compared to their less engaged counterparts[10].

It is crucial to acknowledge that screen time is but one of several factors to consider in the discourse on problematic or excessive smartphone use. The current body of evidence regarding its impact on the physical and psychological well-being of young individuals remains mixed. Recent comprehensive reviews and meta-analyses have found no significant link between screen time that surpasses the American Academy of Pediatrics' guidelines and adverse health outcomes in youth[11].The adage "everything in moderation" arguably serves as a pragmatic counsel for parents navigating discussions on screen time with their children. However, the efficacy of screen time regulation as a strategy to curb problematic behaviors among the youth does not consistently align with this principle [12].

Our investigation shed light on notable shifts in habitual behaviors, particularly concerning smartphone usage in various contexts. A significant finding was that 36% of participants reported frequent or constant smartphone use in the bathroom. Beyond the hygiene concerns and the potential for bacterial contamination associated with this practice, it has emerged as a compulsive behavior for some individuals [13]. A survey from the UK disclosed that 57% of respondents confessed to using their phones in the bathroom, with 8% doing so "always" and an additional 14% "most of the time" [14]. In France, a study conducted in September 2019 with a representative sample of 1,024 individuals found that 46% bring their mobile phone or tablet into the bathroom [15].

The intersection between smartphone use and sleep disturbance warrants close examination. Research in this area has predominantly focused on adolescents and young adults [16]. Our results

reveal that smartphone engagement prior to sleep, including exposure to bright blue light and the use of applications, adversely affects sleep quality. Our investigation explored the ramifications of smartphone and tablet utilization on sleep patterns and driving practices. A notable 43% of participants indicated they go to bed accompanied by their smartphone or tablet, with 15% falling asleep while still engaging with these devices. Additionally, 53% reported awakening alongside their phones. The influence of smartphones and tablets on sleep manifests in various forms. Exposure to the intense blue light emitted by these devices during the evening and nighttime hours can inhibit the synthesis and preservation of melatonin, thereby disrupting the circadian rhythm. Excessive application use before sleep can curtail sleep duration, leading to daytime lethargy and diminished productivity at work. Audible notifications throughout the night further impede the attainment of restful sleep. The phenomenon of 'doomscrolling' exacerbates these issues by decreasing total sleep time and delaying sleep onset and wake times, consequently heightening daytime fatigue. The nighttime use of social media, especially when emotionally engaging with content, is linked to poorer sleep quality. Moreover, the stimulation from engaging in captivating activities on a brightly illuminated screen can elevate psychophysiological arousal, further disturbing sleep [17]. In the context of driving, our findings reveal concerning behaviors: 44% of respondents conceded to using their smartphones while operating a vehicle, with 14% engaging in text messaging and 33% reading messages. Such practices not only compromise the safety of the individuals involved but also pose significant risks to public safety.

The interrelation between habitual smartphone usage and its extension to behaviors behind the wheel has been substantiated through recent research [18]. A study elucidated that the propensity for distraction during driving is a prevalent issue, predominantly observed in drivers below 50 years of age. However, it is crucial to note that no demographic or age group is entirely immune to this trend [19]. Insights from the French Road Safety Observatory highlight the profound implications of smartphone utilization while driving, not only on the driver's safety but also on the wellbeing of other road users. The engagement with a smartphone while driving amplifies the likelihood of accidents by threefold. This risk escalates to 23 times when the driver reads a text message, indicating a significant distraction effect that impairs both cognitive and physical capacities.

Key factors contributing to this risk include elongated reaction and braking times, diminished attention and concentration (particularly noticeable when reading messages), a contracted field of vision thereby affecting the driver's ability to maintain a safe following distance, challenges in lane-keeping, adhering to appropriate speed limits, and integrating safely into traffic flows. These insights underscore the critical safety concerns associated with smartphone use while driving, as detailed on the Sécurité routière website (www.securite-routiere.gouv.fr/dangers-de-la-route/le-telephone-et-la-conduite).

In our cohort, compulsive smartphone use was observed in 66.7% of cases, with 38% exhibiting

scores on the Smartphone Compulsion Test indicative of addiction-like behavior. This test has shown a strong correlation with patterns of problematic smartphone use. However, the diagnosis of smartphone addiction presents challenges not encountered with substance or gambling addictions, with reported prevalence rates among young adults varying from 16.6% to 23.3%[9]. A comprehensive meta-analysis highlighted that excessive smartphone utilization among students is linked to numerous detrimental outcomes, including poor quality sleep, diminished self-esteem, heightened social anxiety, reduced social interactions, and impaired communication skills [20].

The phenomenon of problematic smartphone use has given rise to new digital symptoms, such as anxiety in the absence of a smartphone (41%), anxiety related to low battery levels (27%), and issues with wifi connectivity. Nomophobia, or the fear of being without a mobile phone, poses not only risks of inappropriate and hazardous smartphone use but also has been associated with musculoskeletal disorders in adults, notably affecting the thumbs, likely due to improper usage habits [21]. Further research indicates a direct relationship between nomophobia and personality traits such as extraversion, suggesting that dysfunctional and obsessive beliefs may play a role in its development [22].

Additionally, our study identified prevalent behaviors such as phubbing, observed in 14% of participants. The impact of parental phubbing warrants consideration, especially as a factor in reducing problematic smartphone use and mitigating adolescent burnout [23]. Phubbing tendencies could be predicted among individuals susceptible to boredom, with solitude and the Fear of Missing Out (FoMO) potentially mediating the relationship between boredom and phubbing [24].

Problematic social media use, often stemming from the problematic or excessive use of smartphones, is characterized by a lack of regulatory control over usage and the resultant negative repercussions in daily life. In our research, participants predominantly engaged with platforms such as Facebook, WhatsApp, and Instagram. Indicators of problematic usage identified include passive engagement (e.g., logging in without interacting or aimless scrolling), excessive time spent on these platforms often driven by an uncontrollable urge to log in, and the inability to curtail usage despite efforts. A study within the scope of our literature review posits that problematic social media usage and nomophobia may act as conduits, associating narcissistic traits with heightened stress symptoms, thereby adversely affecting adult psychological well-being in today's digital milieu [25]. Furthermore, a correlation has been observed between problematic social media engagement and increased social isolation among the elderly [26]. Comparable to phenomena observed in substance addiction, individuals with problematic social media habits may exhibit impaired decision-making capabilities and a propensity for riskier behaviors [27]. Notably, the study suggests a dichotomy in social support dynamics: while real-life social support correlates with decreased depression and anxiety levels, virtual social support garnered through social media does not exhibit a similar beneficial impact on mental health [28].

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While our cohort is substantial, it does not fully represent the diversity of the French population due to its size and the uniformity of its participants, all of whom are members of a single complementary insurance scheme. Our research focused on adults, thereby excluding children and adolescents from our analysis. The dissemination of our questionnaire through a private internet link might introduce a selection bias, potentially impacting the comprehension and completion rates among certain respondents. Additionally, individuals with a pre-existing interest in digital technologies, including smartphones, might have been more inclined to participate in our study, further skewing the sample. We acknowledge that our study did not explore the psychological, social, and somatic impacts of problematic or addictive smartphone and social media use, presenting an avenue for future inquiry.

The EVADD study provides an epidemiological and clinical perspective on smartphone usage and its consequences within an adult demographic aged 18 to 60 years. The impact on senior populations remains largely unexplored [29]. In light of the growing concern over digital device usage, the French Government, in mid-January, announced the commissioning of an expert report to address appropriate screen use in domestic and educational settings. Concurrently, the Canadian Paediatrics Society Working Group has highlighted several potential research paths [30]. There's a critical need for a digital usage prevention program tailored to various age groups, emphasizing four primary domains encapsulated in the acronym GERM: Guiding screen use in daily life; Efficient use of screens; Recognition and monitoring of problematic screen use across all ages; and Modeling healthy screen behavior. These areas underscore the importance of continued research into the multifaceted implications of digital device usage.

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Conflict of interest

We declare no competing interests

References

1. *Statista, Number of Smartphone Users in France from 2013 to 2028 Statista. [(accessed on 17 Octobre 2023)]. Available online: https://fr.statista.com/previsions/503231/nombre-utilisateurs-smartphones-france.* 2023.

2. Sherer, J. and P. Levounis, *Technological Addictions.* Curr Psychiatry Rep, 2022. **24**(9): p. 399-406.
3. Billieux, J., et al., *Is Dysfunctional Use of the Mobile Phone a Behavioural Addiction? Confronting Symptom-Based Versus Process-Based Approaches.* Clin Psychol Psychother, 2015. **22**(5): p. 460-8.
4. Franchina, V., et al., *Fear of missing out as a predictor of problematic social media use and phubbing behavior among Flemish adolescents.* Int. J. Environ. Res. Public Health, 2018. **15**: p. 2319.
5. Chotpitayasunondh, V. and K. Douglas, *How "phubbing" becomes the norm: the antecedents and consequences of snubbing via smartphone.* Comput Hum Behav., 2016. **63**: p. 9-18.
6. Karila, L., *Docteur : Addict ou pas ? Harper Collins France.* 2024.
7. Billieux, J., et al., *Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research.* J Behav Addict, 2015. **4**(3): p. 119-23.
8. Greenfield, D., *Smartphone Compulsion Test. In: The Center for Internet and Technology Addiction [Internet]. [cited 4 Sep 2023]. Available: https://virtual-addiction.com/smartphone-compulsion-test/.* 2017.
9. France., S.P., *CoviPrev : une enquête pour suivre l'évolution des comportements et de la santé mentale pendant l'épidémie de COVID-19. Saint-Maurice: Santé publique France; 2020.* https://www.santepubliquefrance.fr/etudes-et-enquetes/coviprev-une-enquete-pour-suivre-l-evolution-des-comportements-et-de-la-sante-mentale-pendant-l-epidemie-de-covid-19. 2020.
10. Adamczewska-Chmiel, K., et al., *Smartphones, the Epidemic of the 21st Century: A Possible Source of Addictions and Neuropsychiatric Consequences.* Int J Environ Res Public Health., 2022. **19**(9): p. 5152.
11. Ferguson, C.J., et al., *Like this meta-analysis: Screen media and mental health.* Professional Psychol., 2022. **53**(2): p. 205–214.
12. Ferguson, C., *Everything in Moderation: Moderate Use of Screens Unassociated with Child Behavior Problems.* Psychiatr Q, 2017. **88**(4): p. 797-805.
13. Turner, A., *WHO ARE AMERICAS TOILET TEXTERS? SMARTPHONE BATHROOM HABITS (TEXTING ON THE TOILET STUDY) (Source: https://www.bankmycell.com/blog/cell-phone-usage-in-toilet-survey#jump2).* 2018.
14. Realtime, Y., *Most Britons use their phone on the toilet https://yougov.co.uk/society/articles/22551-most-britons-use-their-phone-toilet?redirect_from=%2Ftopics%2Fsociety%2Farticles-reports%2F2019%2F02%2F28%2Fmost-britons-use-their-phone-toilet.* 2019.
15. risques, O.d.l.P.d., *L'hyper-connexion - Etude ELABE pour AXA Prévention (https://elabe.fr/wp-content/uploads/2019/10/axa_hyperconnexion_enseignements-definitif.pdf).* 2019.
16. Maurya, C., et al., *The association of smartphone screen time with sleep problems among adolescents and young adults: cross-sectional findings from India.* BMC Public Health., 2022. **5**(22(1)): p. 1686.
17. Nakshine, V., et al., *Increased Screen Time as a Cause of Declining Physical, Psychological Health, and Sleep Patterns: A Literary Review.* Cureus, 2022. **14**(10): p. e30051.
18. Demir, B., et al., *Cell phone-related driver distraction: Habits predict behavior over and above the theory of planned behavior variables.* Accid Anal Prev., 2023. **192**: p. 107200.

19. Cox, A., et al., *Prevalence of distracted driving by driver characteristics in the United States.* J Safety Res, 2023. **86**: p. 346-356.

20. Osorio-Molina, C., et al., *Smartphone addiction, risk factors and its adverse effects in nursing students: A systematic review and meta-analysis.* Nurse Educ Today, 2021. **98**: p. 104741.

21. Nadar, M., et al., *Impact of Nomophobia on Musculoskeletal Problems in the Upper Extremity among Adults: Implications for Occupational Therapy.* Occup Ther Health Care., 2023: p. 1-16.

22. García-Masip, V., et al., *Personality and Nomophobia: The Role of Dysfunctional Obsessive Beliefs.* Int J Environ Res Public Health., 2023. **20**(5): p. 4128.

23. Wang, X., Y. Qiao, and S. Wang, *Parental phubbing, problematic smartphone use, and adolescents' learning burnout: A cross-lagged panel analysis.* J Affect Disord, 2023. **320**: p. 442-449.

24. Gao, B., et al., *Why Cannot I Stop Phubbing? Boredom Proneness and Phubbing: A Multiple Mediation Model.* Psychol Res Behav Manag., 2023. **16**: p. 3727-3738.

25. Casale, S. and V. Banchi, *Narcissism and problematic social media use: A systematic literature review.* Addict Behav Rep, 2020. **11**: p. 100252.

26. Meshi, D., S. Cotten, and A. Bender, *roblematic Social Media Use and Perceived Social Isolation in Older Adults: A Cross-Sectional Study.* Gerontology, 2020. **66**(2): p. 160-168.

27. Meshi, D., D. Freestone, and C. Ozdem-Mertens, *Problematic social media use is associated with the evaluation of both risk and ambiguity during decision making.* J Behav Addict, 2021. **10**(3): p. 779-787.

28. Meshi, D. and M.E. Ellithorpe, *Problematic social media use and social support received in real-life versus on social media: Associations with depression, anxiety and social isolation.* Addict Behav, 2021. **119**: p. 106949.

29. Lee, H., et al., *Digital Health Technology Use Among Older Adults: Exploring the Impact of Frailty on Utilization, Purpose, and Satisfaction in Korea.* J Korean Med Sci., 2024. **8**(39): p. 1.

30. Société canadienne de pédiatrie, g.d.t.s.l.s.n., Ottawa (Ontario). , *Les médias numériques : la promotion d'une saine utilisation des écrans chez les enfants d'âge scolaire et les adolescents.* Paediatr Child Health., 2019. **24**(6): p. 402-417.

Tables and figures

Table 1: Participant characteristics

Responder characteristics		N = 21 244	95% IC	Number of answers
Age, mean (SD)		53 (15)	53, 53	19 720
missing		1 524		
Age group % (n)	18-39	22% (4 394)	22%, 23%	
	40-59	39% (7 650)	38%, 40%	
	≥ 60	39% (7 660)	38%, 40%	
Sex, % (n)				20 641

Responder characteristics	N = 21 244	95% IC	Number of answers
male	52% (10 797)	52%, 53%	
female	48% (9 844)	47%, 48%	
missing	603		
Socio-professional category, % (n)			20 800
Retirees	31% (6 501)	31%, 32%	
Employees	25% (5 260)	25%, 26%	
Workmen	16% (3 300)	15%, 16%	
Managers, high intellectual professions	13% (2 708)	13%, 13%	
Craftsmen, shopkeepers, business leaders	5.3% (1 101)	5.0%, 5.6%	
Intermediate professions	4.9% (1 015)	4.6%, 5.2%	
No professional activity	4.3% (895)	4.0%, 4.6%	
Farmer holders	<0.1% (20)	0.06%, 0.15%	
Missing	444		
Family status, % (n)			19 837
Married or in couple	72% (14 293)	71%, 73%	
Single	13% (2 604)	27%, 28%	
Children			
Yes, % (n)	78% (15 611)	78%, 79%	19 987
Number, mean (SD)	2.13 (1.00)	2.1, 2.1	13 923
Missing	7 321		

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Table 2: Smartphone Compulsion test: positive answers by item (12034 participants)

Positive answers by item, % (n)	N = 12 034	95% IC
1. Do you find yourself spending more time on your cell or smartphone than you realize?	62% (7 447)	61%, 63%
2. Do you find yourself mindlessly passing time on a regular basis by staring at your cell or smartphone?	64% (7 679)	63%, 65%
3. Do you seem to lose track of time when on your cell or smartphone?	53% (6 434)	53%, 54%
4. Do you find yourself spending more time texting, tweeting, or emailing as opposed to talking to people in person?	26% (3 073)	25%, 26%
5. Has the amount of time you spend on your cell or smartphone been increasing?	44% (5 302)	43%, 45%
6. Do you wish you could be a little less involved with your phone?	55% (6 610)	54%, 56%
7. Do you sleep with your cell or smartphone (turned on) under your pillow or next to your bed on a regular basis?	45% (5 450)	44%, 46%
8. Do you find yourself viewing and answering texts, tweets, and emails at all hours of the day and night—even if it means interrupting other things you are doing?	15% (1 821)	14%, 16%
9. Do you text, email, tweet, Snapchat, Facebook message, or surf while driving or doing other similar activities that require your focused attention and concentration?	14% (1 741)	14%, 15%
10. Do you feel your use of your cell or smartphone decreases your productivity at times?	36% (4 381)	36%, 37%
11. Do you feel reluctant to be without your cell or smartphone, even for a short time?	26% (3 184)	26%, 27%
12. Do you feel ill at ease or uncomfortable when you accidentally leave your smartphone in the car or at home, have no service, or have a broken phone?	57% (6 902)	56%, 58%
13. When you eat meals, is your cell or smartphone always part of the table place setting?	32% (3 846)	31%, 33%
14. When your cell or smartphone rings, beeps, or buzzes, do you feel an intense urge to check for texts, tweets, emails, updates, and so on?	47% (5 666)	46%, 48%
15. Do you find yourself mindlessly checking your cell or smartphone many times a day, even when you know there is likely nothing new or important to see?	61% (7 361)	60%, 62%
Total number of positive responses, % (n)		
0	4.1% (489)	3.7%, 4.4%
1 - 2	12% (1 481)	12%, 13%
3 - 4	17% (2 037)	16%, 18%
5 - 7	29% (3 458)	28%, 30%
≥ 8	38% (4 569)	37%, 39%
Total score		
Mean (SD)	6.4 (3.6)	6.3 , 6.5

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Table 3: Impact of smartphone use or problematic use.

Characteristics		95% CI	Number of answers
Driving, % (n)			12 953
	Smartphone use while driving (calls, sms, GPS)	44% (5 736)	43%, 45%	
	GPS set-up while driving	43% (5 577)	42%, 44%	
	Sending messages while driving	14% (1 817)	13%, 15%	
	Glancing at notifications while driving	33% (4 288)	32%, 34%	
Nomophobia, % (n)			
	Anxiety without smartphone	41% (5 582)	40%, 42%	13 660
	Smartphone is a mental USB key	33% (4 527)	32%, 34%	13 636
	Anxiety if smartphone discharge	27% (3 725)	26%, 28%	13 704
	Anxiety if no network	24% (3 248)	23%, 24%	13 663
	Smartphone malfunction as worrying as a child disease	19% (2 629)	19%, 20%	13 627
	Find socket and have Wi-Fi as priority	15% (1 991)	14%, 15%	13 688
	Anxiety if not able to answer call/notification	15% (2 036)	14%, 16%	13 651
	No repair of broken screen for fear of separation	9.2% (1 261)	8.8%, 9.7%	13 642
	Not lending own's charger	14% (1 873)	13%, 14%	13 613
	Sleep disorder if smartphone not near	7.8% (1 063)	7.4%, 8.3%	13 596
Athazagoraphobia, % (n)		7.3% (940)	6.9%, 7.8%	12 865
Phubbing, % (n)		14% (1 818)	14%, 15%	12 865
Smombie, % (n)		11% (1 452)	11%, 12%	12 865

Nomophobia: mobile phone addiction through compulsive checking of new messages or social networks.
Athazagoraphobia, or FoMo: fear of being excluded from enriching social experiences, Fear of Missing Out.
Phubbing: a portmanteau of "phone" and "snubbing" refers to individuals ignoring someone they are with and giving attention to their mobile phone instead.
Smombie: a portmanteau of "smartphone" and "zombie" refers to individuals who focus on their smartphones while walking.

Table 4: Median compulsion score according to activities with digital devices

Characteristic	Median score (IQR)	P
Daily leisure time on screens		* P = 0.001
≤ 25 minutes (n = 936)	2 (3)	
26 – 45 minutes (n = 2086)	4 (4)	
46 minutes to 1h30 (n = 2840)	6 (5)	
1h31 to 2h15 (n = 2542)	7 (4)	
2h16 to 3h00 (n = 1721)	8 (4)	
> 3h (n = 1827)	9 (5)	
Going to the toilets with smartphone/tablet		* P = 0.001
Never (n = 3446)	4 (5)	
Rarely (n = 3163)	6 (5)	
Often (n = 3498)	7 (5)	
Always (n = 1841)	9 (4)	
Going to bed with smartphone/tablet		* P = 0.001
Never (n = 3632)	4 (4)	
Rarely (n = 1786)	4 (5)	
Often (n = 2147)	7 (4)	
Always (n = 4372)	8 (5)	
Falling asleep with smartphone/tablet		** P = 0.001
Yes (n = 2317)	9 (6)	
No (n = 9784)	6 (5)	
Consulting smartphone/tablet at wake-up		** P = 0.001
Yes (n = 7233)	8 (5)	
No (n = 4682)	4 (5)	

* Kruskal-Wallis test ** Mann-Whitney-Wilcoxon test

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Table 5: Median compulsion score according to smartphone use or overuse

Characteristic			Median score (IQR)	P*
Smartphone and driving				
	Smartphone use while driving (calls, sms, GPS)	Yes (n = 5350)	8 (5)	=0.001
		No (n = 6503)	5 (5)	
	GPS set-up while driving	Yes (n = 5156)	7 (5)	=0.001
		No (n = 6697)	5 (5)	
	Sending messages while driving	Yes (n = 1706)	9 (5)	=0.001
		No (n = 10147)	6 (5)	
	Glancing notifications while driving	Yes (n = 4000)	8 (5)	=0.001
		No (n = 7853)	5 (5)	
Nomophobia				
	Anxiety without smartphone	Yes (n = 4,972)	8 (5)	=0.001
		No (n = 6,970)	5 (5)	
	Smartphone is a mental USB key	Yes (n = 4,120	8 (5)	=0.001
		No (n = 7807)	5 (5)	
	Anxiety if smartphone discharge	Yes (n = 3272)	9 (5)	=0.001
		No (n = 8705)	5 (5)	
	Anxiety if no network	Yes (n = 2842)	9 (5)	=0.001
		No (n = 9106)	6 (5)	
	Smartphone malfunction as worrying as a child disease	Yes (n = 2286)	8 (6)	=0.001
		No (n = 9623)	6 (6)	
	Find socket and have Wi-Fi as priority	Yes (n = 1713)	8 (5)	=0.001
		No (n = 10 247)	6 (6)	
	Anxiety if not able to answer call/notification	Yes (n = 1779)	9 (5)	=0.001
		No (n = 10 152)	6 (5)	
	No repair of broken screen for fear of separation	Yes (n = 1614)	8 (6)	=0.001
		No (n = 10 293)	6 (6)	
	Not lending own's charger	Yes (n = 1614)	8 (6)	=0.001
		No (n = 10 293)	6 (6)	
	Sleep disorder if smartphone not near	Yes (n = 944)	11 (5)	=0.001
		No (n = 10 945)	6 (6)	

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Characteristic		Median score (IQR)	P*
Athazagoraphobia			
	Yes (n = 862)	10 (5)	=0.001
	No (n = 10 914)	6 (6)	
Phubbing			
	Yes (n = 1688)	10 (5)	=0.001
	No (n = 10 088)	6 (5)	
Smombie			
	Yes (n = 1354)	10 (5)	=0.001
	No (n = 10 422)	6 (5)	

Nomophobia: mobile phone addiction through compulsive checking of new messages or social networks.
Athazagoraphobia, or FoMo: fear of being excluded from enriching social experiences, Fear of Missing Out.
Phubbing: a portmanteau of “phone” and “snubbing” refers to individuals ignoring someone they are with and giving attention to their mobile phone instead.
Smombie: a portmanteau of “smartphone” and “zombie” refers to individuals who focus on their smartphones while walking.
* Mann-Whitney-Wilcoxon test

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Table 6: Social networks use.

Characteristics		95% CI	Number of answers
Use of social networks, % (n)	57% (12 102)	56%, 58%	21 244
Type of social network, % (n)			12 196
Facebook	89% (10 873)	89%, 90%	
WhatsApp	67% (8 166)	66%, 68%	
Instagram	46% (5 573)	45%, 47%	
Snapchat	29% (3 548)	28%, 30%	
LinkedIn	27% (3 258)	26%, 28%	
TikTok	17% (2 047)	16%, 17%	
Network behaviour, % (n)			
Log-in to simply watch without comments	70% (8 412)	69%, 71%	12 025
Scrolling through newsfeed without paying attention	57% (6 916)	56%, 58%	12 070
Too much time on social network	40% (4 800)	39%, 40%	12 143
Constant log-in to comment, post or like	18% (2 186)	17%, 19%	12 102
Log-in to simply watch without comments, and sadness afterward	10% (1 184)	9.5%, 11%	11 756
Irrepressible need to connect more and more			4 787
Never	11% (531)	10%, 12%	
Rarely	28% (1 321)	26%, 29%	
Often	48% (2 318)	47%, 50%	
Always	13% (617)	12%, 14%	
Unsuccessful tries to reduce use			4 752
Never	27% (1 293)	26%, 29%	
Rarely	34% (1 612)	33%, 35%	
Often	32% (1 527)	31%, 33%	
Always	6.7% (320)	6.0%, 7.5%	
Use with negative impact on work/schooling/personal life			4 719
Never	50% (2 346)	48%, 51%	
Rarely	32% (1 494)	30%, 33%	
Often	14% (682)	13%, 15%	
Always	4.2% (197)	3.6%, 4.8%	

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Characteristics		95% CI	Number of answers
Overtime for thinking or planning next connection			4 774
Never	58% (2 777)	57%, 60%	
Rarely	30% (1 418)	28%, 31%	
Often	9.2% (440)	8.4%, 10%	
Always	2.9% (139)	2.5%, 3.4%	
Agitation or upset if network access denied			4 771
Never	72% (3 444)	71%, 73%	
Rarely	20% (947)	19%, 21%	
Often	5.6% (265)	4.9%, 6.3%	
Always	2.4% (115)	2.0%, 2.9%	

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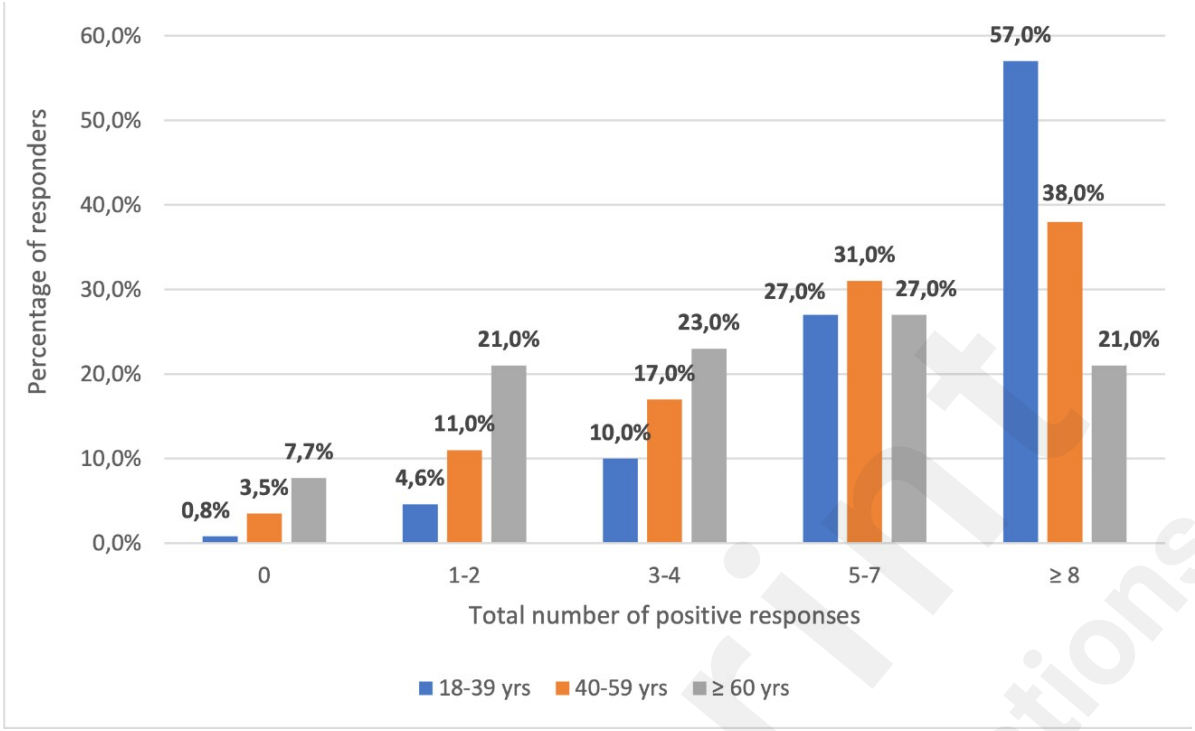
Figure 1 Responses by age category in the Smartphone compulsion test



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Supplementary Files

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Figures

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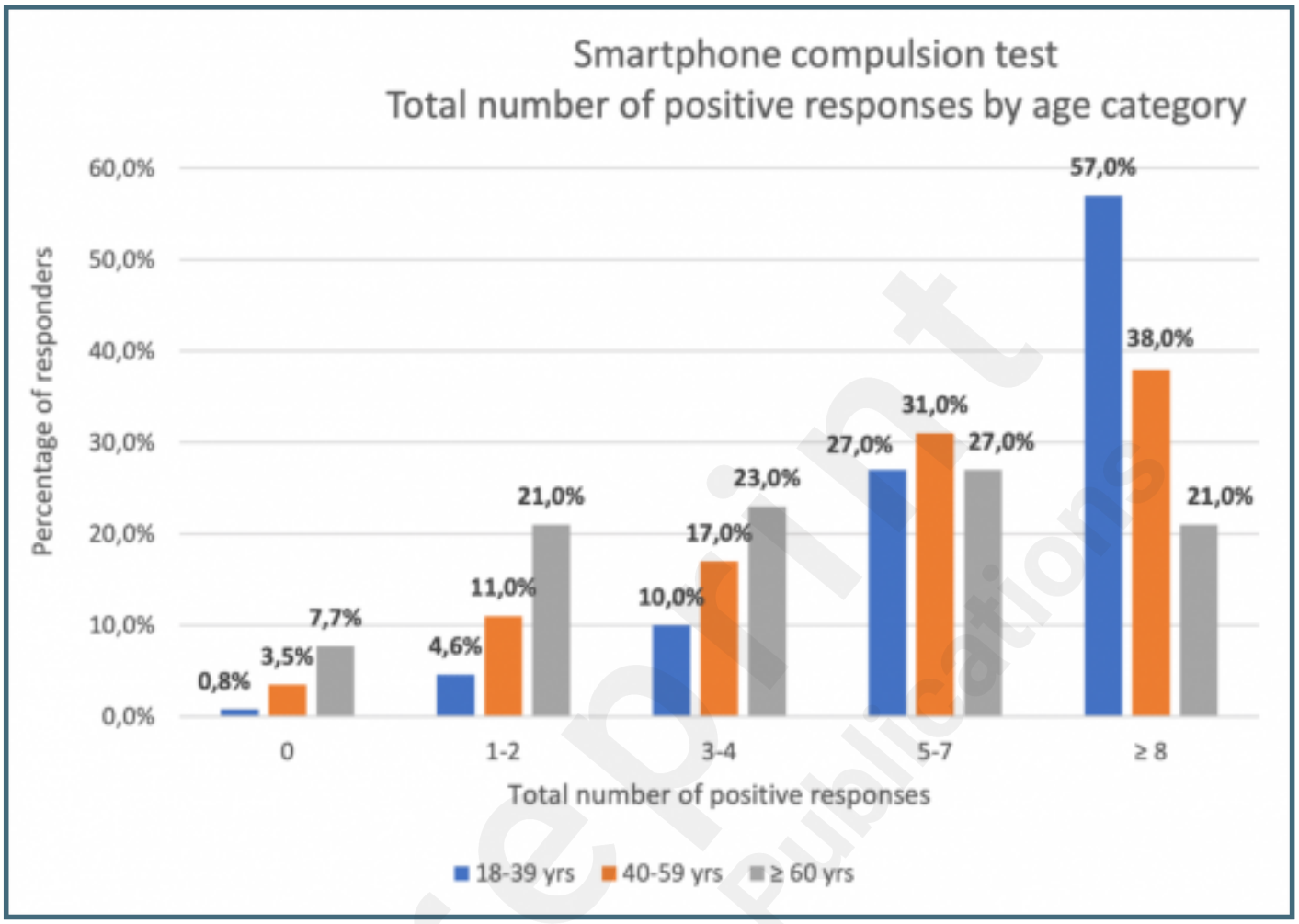
Responses by age category in the smartphone compulsion test.



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