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Technological Addictions: The Influence of Emotions, Personality Traits, and Sociocultural Variables on New Disorders of the Digital Age

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Table of abbreviations

Abbreviation	Definition
IA	Internet Addiction
SMA	Social Media Addiction
NomoPhobia	No Mobile Phone Phobia
FoMO	Fear of Missing Out
IGD	Internet Gaming Disorder
Phubbing	Phone-Snubbing
PUI	Problematic Usage of Internet
MUDs	MultiUser Dimensions
APA	American Psychiatric Association
DSM-5	Diagnostic and Statistic Manual of Mental Disorders - fifth edition
DSM-4	Diagnostic and Statistic Manual of Mental Disorders - fourth edition
ICD-11	International Classification of Diseases-11th Revision
WHO	World Health Organization
ACE	Adverse Childhood Experiences
SDT	Self-Determination Theory
ADHD	Attention Deficit Hyperactivity Disorder
PTSD	Post-Traumatic-Stress-Disorder
OCD	Obsessive-Compulsive-Disorder
IAT	Internet Addiction Test
BSMAS	Bergen Social Media Addiction Scale
FoMOs	Fear of Missing Out scale
DERS	Difficulties in Emotion Regulation Scale
BFI-10	Big Five Inventory-10
BFI-15	Big Five Inventory-15
IGDS9-SF	Internet gaming Disorder Scale-9 Short Form
PHUB	Phubbing Scale
PS	Prosociality Scale
SMES	Social Media Engagement Scale
UPPS-P	Impulsive Behavior Scale
MANOVA	Multivariate Analysis of Variance
VIF	Variance Inflation Factor

According to the agreement established within the doctoral program at La Sapienza University of Rome, English is recognized as the official language of the thesis, in compliance with international academic standards. This choice aligns with the institution's policies on promoting global research accessibility and dissemination. However, as specified in the same agreement, the abstract and conclusions of this thesis have been translated into both Italian and Spanish to ensure comprehensive understanding and to meet the requirements stipulated by the convention for multilingual academic communication.

Abstract

This doctoral thesis investigates the relationships between Internet Addiction (IA) related disorders and various psychological and behavioral variables, such as Fear of Missing Out (FoMO), emotional dysregulation and personality traits, across different samples and cultural contexts. Previous research has predominantly focused on the general population, often overlooking cultural and gender differences in the development of IA. This thesis aims to fill these gaps by providing a comprehensive analysis across diverse demographics.

This thesis is organized into multiple sections.

The first section is theoretical, aiming to frame the phenomenon of IA and related disorders by illustrating the current state of research and its evolution.

The second section describes the methodology, materials used, data collection procedures, and tools, providing a detailed discussion of each study that comprises the compendium. Specifically:

The first study explored the associations between IA, FoMO, Social Media Addiction (SMA), emotional dysregulation, and personality traits in an Italian sample of 397 participants aged 18–35. Significant correlations were found between IA and the examined variables, with emotional dysregulation playing a crucial role in mediating the effects of FoMO and problematic social media use on IA.

The second study aimed to replicate and strengthen these findings in a Spanish sample of 598 university students aged 18–35. Correlation analyses confirmed positive relationships between IA, FoMO, SMA, emotional dysregulation, and the neuroticism dimension of personality, while a negative relationship was observed with the conscientiousness dimension. A mediation model further highlighted the significant total effect of emotional dysregulation on IA, mediated by FoMO and SMA.

The third study examined gender differences in the relationships between IA and related variables in an Italian sample of 276 participants aged 18–30. The results indicated that while SMA was a primary predictor of IA for both genders, there were exclusive predictors for each gender, suggesting that the underlying factors for IA vary significantly between men and women.

The fourth study similarly investigated gender differences in a Spanish sample of 276 participants aged 18–30. Consistent with the findings from the Italian sample, SMA emerged as a common predictor of IA for both genders. However, unique predictors for each gender were also identified, underscoring the necessity to consider gender-specific factors in understanding IA.

The fifth study expanded the investigation to four countries (Italy, Spain, Ecuador, and Peru) with a total sample of 675 participants aged 18–54. Significant cultural variations were found: Italian participants exhibited higher levels of IA and FoMO, but lower levels of Internet Gaming Disorder (IGD) compared to Peruvian participants. Regression analyses identified distinct predictors for problematic internet use in each country, emphasizing the importance of cultural context in understanding IA.

The third section presents and discusses the results of each study, highlighting significant correlations and mediation models.

Finally, the last section offers a general conclusion discussing the practical implications of these results for the prevention and tailored treatment.

In conclusion, these studies provide an integrated model for understanding the characteristics, predictors, and risk factors of IA. The findings highlight the importance of psychological variables and cultural and gender differences, offering practical implications for the prevention and tailored treatment of this pathological behavior.

Riassunto

Questa tesi di dottorato esamina le relazioni tra i disturbi legati alla Internet Addiction (IA) e diverse variabili psicologiche e comportamentali, come la Fear of Missing Out (FoMO) o paura di essere esclusi e/o di perdere esperienze potenzialmente gratificanti, la disregolazione emotiva e i tratti della personalità, in vari campioni e contesti culturali. Le ricerche precedenti si sono concentrate principalmente sulla popolazione generale, spesso trascurando le differenze culturali e di genere nello sviluppo della dipendenza da Internet. Questa tesi mira a colmare tali lacune, fornendo un'analisi approfondita attraverso diverse demografie.

Questa tesi è strutturata in diverse sezioni.

La prima parte è teorica e mira a inquadrare il fenomeno della IA e i disturbi correlati, illustrando lo stato dell'arte della ricerca e la sua evoluzione.

La seconda parte descrive la metodologia impiegata, i materiali utilizzati, le procedure di raccolta dati e gli strumenti, con una trattazione dettagliata di ciascun studio che compone il compendio. Nello specifico:

Il primo studio ha esplorato le associazioni tra IA, FoMO, Social Media Addiction (SMA), disregolazione emotiva e tratti della personalità in un campione italiano di 397 partecipanti, di età compresa tra i 18 e i 35 anni. Sono state riscontrate correlazioni significative tra IA e le variabili esaminate, con la disregolazione emotiva che ha giocato un ruolo cruciale nel mediare gli effetti di FoMO e dell'uso problematico dei social media su IA.

Il secondo studio ha replicato e approfondito questi risultati in un campione spagnolo di 598 studenti universitari, di età compresa tra i 18 e i 35 anni. Le analisi delle correlazioni hanno confermato relazioni positive tra IA, FoMO, SMA, disregolazione emotiva e la dimensione della personalità del nevroticismo, mentre è stata osservata una relazione negativa con la dimensione della coscienziosità. Un modello di mediazione ha ulteriormente evidenziato l'effetto significativo della disregolazione emotiva su IA, mediato da FoMO e SMA.

Il terzo studio ha esaminato le differenze di genere nelle relazioni tra IA e le variabili correlate in un campione italiano di 276 partecipanti, di età compresa tra i 18 e i 30 anni. I risultati hanno indicato che, mentre la SMA era un predittore principale della IA per entrambi i generi, esistevano predittori esclusivi per ciascun genere, suggerendo che i fattori sottostanti per la IA variano significativamente tra uomini e donne.

Il quarto studio ha indagato similmente le differenze di genere in un campione spagnolo di 276 partecipanti, di età compresa tra i 18 e i 30 anni. In linea con i risultati del campione italiano, la SMA è emersa come un predittore comune di IA per entrambi i generi. Tuttavia, sono stati identificati predittori unici per ciascun genere, sottolineando la necessità di considerare fattori specifici di genere nella comprensione della IA.

Il quinto studio ha ampliato l'indagine a quattro paesi (Italia, Spagna, Ecuador e Perù) con un campione totale di 675 partecipanti, di età compresa tra i 18 e i 54 anni. Sono emerse significative variazioni culturali: i partecipanti italiani hanno mostrato livelli più alti di IA e FoMO, ma livelli più bassi di disturbo da gioco su Internet o Internet Gaming Disorder (IGD), rispetto ai partecipanti peruviani. Le analisi di regressione hanno identificato predittori distinti per l'uso problematico di Internet in ciascun paese, evidenziando l'importanza del contesto culturale nella comprensione di IA.

La terza parte presenta e discute i risultati di ciascuno studio, evidenziando correlazioni significative e modelli di mediazione.

Infine, l'ultima parte include una conclusione generale in cui si discutono le implicazioni pratiche di questi risultati per la prevenzione e il trattamento personalizzato.

In conclusione, questi studi forniscono un modello integrato per comprendere le caratteristiche, i predittori e i fattori di rischio della dipendenza da Internet. I risultati evidenziano l'importanza delle variabili psicologiche e delle differenze culturali e di genere, offrendo implicazioni pratiche per la prevenzione e il trattamento mirato di questo comportamento patologico.

Resumen

Esta tesis doctoral examina las relaciones entre los trastornos relacionados con la adicción a Internet u Internet Addiction (IA) y diversas variables psicológicas y conductuales, como el miedo a perderse experencias o Fear of Missing Out (FoMO), la desregulación emocional y los rasgos de personalidad, en diferentes muestras y contextos culturales. Las investigaciones previas se han centrado principalmente en la población general, a menudo pasando por alto las diferencias culturales y de género en el desarrollo de la adicción a Internet. Esta tesis tiene como objetivo llenar estas lagunas proporcionando un análisis exhaustivo a través de diversas demografías.

Esta tesis está organizada en múltiples secciones.

La primera sección es teórica y busca enmarcar el fenómeno de la IA y los trastornos relacionados, ilustrando el estado actual de la investigación y su evolución.

La segunda sección describe la metodología empleada, los materiales utilizados, los procedimientos de recopilación de datos y las herramientas, proporcionando una discusión detallada de cada estudio que compone el compendio. Específicamente:

El primer estudio exploró las asociaciones entre la IA, FoMO, la adicción a redes sociales u Social Media Addiction (SMA), la desregulación emocional y los rasgos de personalidad en una muestra italiana de 397 participantes, de entre 18 y 35 años. Se encontraron correlaciones significativas entre IA y las variables examinadas, siendo la desregulación emocional un factor crucial en la mediación de los efectos de FoMO y el uso problemático de las redes sociales sobre IA.

El segundo estudio replicó y profundizó estos hallazgos en una muestra española de 598 estudiantes universitarios, de entre 18 y 35 años. Los análisis de correlación confirmaron relaciones positivas entre IA, FoMO, SMA, desregulación emocional y la dimensión de la personalidad del neuroticismo, mientras que se observó una relación negativa con la dimensión de la conciencia. Un modelo de mediación destacó aún más el efecto significativo de la desregulación emocional sobre IA, mediado por FoMO y SMA.

El tercer estudio examinó las diferencias de género en las relaciones entre IA y las variables relacionadas en una muestra italiana de 276 participantes, de entre 18 y 30 años. Los resultados indicaron que, si bien SMA era un predictor principal de IA para ambos géneros, existían predictores exclusivos para cada género, lo que sugiere que los factores subyacentes para IA varían significativamente entre hombres y mujeres.

El cuarto estudio investigó de manera similar las diferencias de género en una muestra española de 276 participantes, de entre 18 y 30 años. En línea con los resultados de la muestra italiana, SMA emergió como un predictor común de IA para ambos géneros. Sin embargo, se identificaron predictores únicos para cada género, subrayando la necesidad de considerar factores específicos de género en la comprensión de IA.

El quinto estudio amplió la investigación a cuatro países—Italia, España, Ecuador y Perú—con una muestra total de 675 participantes, de entre 18 y 54 años. Se encontraron variaciones culturales significativas: los participantes italianos mostraron niveles más altos de IA y FoMO, pero niveles más bajos de trastorno por juego en Internet u Internet Gaming Disorder (IGD) en comparación con los participantes peruanos. Los análisis de regresión identificaron predictores distintos para el uso problemático de Internet en cada país, enfatizando la importancia del contexto cultural en la comprensión de IA.

La tercera parte presenta y discute los resultados de cada estudio, destacando correlaciones significativas y modelos de mediación.

Finalmente, la última sección ofrece una conclusión general en la que se discuten las implicaciones prácticas de estos resultados para la prevención y el tratamiento personalizado.

En conclusión, estos estudios proporcionan un modelo integrado para comprender las características, los predictores y los factores de riesgo de la adicción a Internet. Los hallazgos destacan la importancia de las variables psicológicas y las diferencias culturales y de género, ofreciendo implicaciones prácticas para la prevención y el tratamiento personalizado de este comportamiento patológico.

Theoretical Introduction

1. Internet Addiction (IA) and problematic Usage of Internet (PUI): a multidimensional phenomenon

1.1. Definition

The use of the Internet has intensely increased in the last few decades, becoming integral part of our daily lives, causing inevitable changes in many activities (Akınoglu, 2002) and changing the way of communicating and approaching the social and physical environment (Musetti & Corsaro, 2018).
On the one hand, these digital tools allow us to research, share, and publish online contents (Kuss & Griffiths, 2017), bringing several tangible benefits, facilitating communication, education, and information, supporting research and work activities, as well as representing tools for leisure and entertainment. On the other hand, in recent years, a growing number of studies have pointed out that excessive, problematic, and uncontrolled use of digital technology and online applications can lead to physical, psychological, social, and work-related problems and negative consequences (Kuhu et al., 2017; Santos et al., 2017; Shirinkam et al., 2016; Yeap et al., 2015).
In the last few years, research focused on understanding the Internet Addiction (IA) or problematic usage of the internet (PUI, Mental Health in a digital World, 2022).
The scientific community still disagrees with the terminology to be attributed to Internet use and/or abuse (Fernandes et al., 2019). By using the term IA, we refer to impulse control problems (Liu & Potenza, 2007) and all maladaptive and excessive behaviour related to the World Wide Web (Andreassen, 2015; Kuss & Griffiths, 2011) that can negatively affect biopsychosocial health.
More in detail, IA is an addictive disorder characterized by intensive and obsessive use of the Internet, including social networking, video, and online gaming sites (Starcevic et al., 2017; Starcevic & Billieux, 2017). Indeed, IA has become an important area of study that has attracted interest from across different disciplines, including psychology, sociology, and communication (Balci & Gülnar, 2013).
The Internet use can be a primary daily activity, becoming harmful in different areas of the human existence. People affected by this disorder may manifest symptoms commonly associated with the substance and behavioral addictions, such as salience, mood modification, withdrawal, tolerance, and conflict (Griffiths 1995; Kuss et al. 2014) and consequently lead to physical, psychological, and social problems (Lebni et al., 2020). Indeed, individuals addicted to the Internet may use it for extended periods, thus isolating themselves from other forms of social contact and focusing almost entirely on online rather than real-life events (Weinstein & Lejoyeux, 2010).

Lack of control is a core definition of psychoactive substance dependence or addiction. Since it occurs in a range of behaviors that are separate from substance abuse, the concept of non-substance or "behavioral" addictions, i.e., syndromes like substance dependence but with a different behavioral focus, has emerged. Thus, the term "behavioral addiction" specifically refers to a form of reinforcement resulting from the enactment of a particular behavior, namely a behavior performed for its own sake (Robbins & Clark, 2015). Although this construct has some scientific and clinical heuristic value, it remains controversial (Grant et al., 2010). Analogous to substance abuse disorders, Griffiths (2005) described typical symptoms of behavioral addictions, later validated within the framework of the IA Components Model (Kuss et al., 2005), which includes: salience; mood modification; tolerance; withdrawal; relapse; conflict.

Nevertheless, it should be emphasized that IA can be described by referring to different ways in which the internet itself can be used. According to Young et al. (1998), IA includes a wide variety of behaviour and impulse control disorders. Five subtypes of IA can be described as follows: compulsive online gambling; cybersexual addiction, which refers to exaggerated access and research of available material online forbidden to minors (e.g., pornographic images, games, movies); cyber relationship addiction, where individuals who exhibit behaGviour compatible with social media addiction (SMA) attribute a stronger character to virtual relationships than to real ones, thus leading to issues in interpersonal and family relationships; MultiUser dimensions (MUDs); and internet gaming disorder (IGD), which refers to role-playing games in which several users can play simultaneously online; information overload addiction, which is an obsessive search for information for most of the time being connected.

Another explanation of the multidimensionality of the phenomenon has been provided by Fineberg et al. (2022), who included different online activities in the PUI. They described two main categories of PUI: *1) Impulsive behaviors* (e.g., games online, gambling online, compulsive shopping online, use of pornographic sites, excessive use of social media). *2) Compulsive behaviors* (i.e., cyberchondria, cyberstalking, digital hoarding). However, the two categories may contain elements of impulsiveness and compulsivity simultaneously (Fineberg et al., 2022).

The topic is strongly debated since even the term "addiction" is sometimes perceived as stigmatizing. The consideration of these addictions as new mental disorders, particularly because they are related to excessive engagement in non-substance activities, also stimulates considerable debate (Petry et al., 2014). As suggested by Billieux et al. (2015), addiction diagnoses need to consider two mandatory factors, such as functional impairment and temporal continuity, which are not always observed in these dysfunctional behaviors.

The American Psychiatric Association (APA) had considered the inclusion of these behavioral, or non-substance addictions, such as gambling, internet gaming, internet use in general, sex, eating, shopping, and exercise among recognized mental disorders. However, according to the guidelines identified by Stein et al. (2010), only the gambling disorder has been included in the DSM-5 (American Psychiatric Association, 2013; Derevensky et al., 2019), while Internet Gaming Disorder (IGD) has been proposed as a condition included in the "conditions for future research" section of the DSM-5 TR (APA, 2022).

Several research has shown that IA has characteristics and symptoms comparable to those of gambling disorder (e.g., preoccupation, tolerance, withdrawal, failure to control, impaired decision making) and comorbidity with depression and anxiety (Kaess et al., 2014; Wölfling et al., 2013), obsessive-compulsive symptoms (Andreassen et al., 2016; Chamberlain et al., 2016; Jorgenson et al., 2016; Sussman et al., 2021), attention deficit and hyperactivity disorder (Ioannidis et al., 2016), and hostility–aggression behaviors (Yen et al., 2007; Bersani et al., 2022).

Given that, IA is not currently listed as a formal disorder by the main diagnostic classifications, such as the Diagnostic and Statistical Manual of Mental Disorders—fifth edition (DSM-5; APA, 2013) and the International Classification of Diseases—11th Revision (ICD-11, World Health Organization, WHO, 2018).

Also, the DSM-5 proposed criteria for Gambling disorder have some parallels with Internet gaming disorder (IGD) whose diagnostic criteria, in turn, could be applied to problems arising from an extensive internet use beyond gaming, as these addictions share some specific features. People, in fact, may use the internet for many activities in a problematic way, including gambling, as well as gaming, shopping, socializing, viewing pornographic material, and information gathering (Petry et al., 2018). The inclusion of one of its phenomenological manifestations—internet gaming addiction disorder—has been proposed in the DSM-5, while it is described as a manifestation of the Gaming Disorder (6C51) in the ICD-11.

Most of the literature has focused on IGD or online Gambling Disorder (Ioannidis et al., 2018). However, other types of online activity such as problematic use of social media and smartphones are also worth exploring.

1.2. Etiology

The exact etiology of IA is not precisely known. Nevertheless, current research is largely based on the biopsychosocial model (Engel, 1977), which suggests that various factors contribute to its development.

In the context of IA, the biopsychosocial model considers a complex interplay of biological, psychological, and social factors (Engert et al., 2020). Biologically, IA may involve imbalances in neurotransmitter systems within the brain, leading to altered reward processing and impulse control (WHO, 2022). Genetic predispositions, prenatal factors, substance abuse, and exposure to toxins may also contribute to its development.

Psychological factors play a significant role in IA. These may include cognitive factors such as coping strategies, personality traits like impulsivity, and emotional regulation difficulties (WHO, 2022). Individuals with certain psychological vulnerabilities may be more prone to develop problematic internet use patterns.

Social factors also influence IA. Dysfunctional family dynamics, social isolation, peer pressure, and cultural norms surrounding technology use can all contribute to the development and maintenance of IA (Patalay & Fitzsimmons, 2018). Additionally, limited social support networks may exacerbate feelings of loneliness and reliance on the Internet for social interaction. Research suggests that there may be gender disparities in the development and presentation of IA, with some studies indicating higher prevalence rates among males compared to females (Kuss & Griffiths, 2012). Gender-specific socialization patterns and societal expectations regarding Internet usage may contribute to these differences, with males often encouraged to engage in more gaming and online activities compared to females (Kardefelt-Winther, 2014). Therefore, this project also focuses on these specific subtypes of IA, analyzing the possible differences related to gender. In fact, gender-related differences in addictive behaviors and their motivations have been reported by several studies (e.g., Tang et al., 2017) and have been considered important for understanding IA (Liang et al., 2016).

Cultural background also influences the prevalence and patterns of IA. Cultural norms and values regarding technology use, social interaction, and leisure activities vary widely across different societies (Lemmens et al., 2015). For example, cultures that place a strong emphasis on academic achievement or career success may have higher rates of IA among students or professionals who rely heavily on online resources for studying or work-related activities (Mak et al., 2014). Stigma surrounding mental health issues, particularly in collectivist cultures where seeking help may be seen as a sign of weakness or shame, can act as barriers to seek treatment for IA (Wang et al., 2015).

1.3. Epidemiology

To gain an overview of how internet usage has become part of everyone's daily routine, we can cite some data from the Worldwide Internet Usage website (2023).

In 2023, there were approximately five billion internet users worldwide, with significant variations in user distribution across countries. Eastern Asia displayed the highest number of Internet users, totaling 1.24 billion, while regions in Africa and the Middle East reported lower amounts. Urban areas generally exhibited higher rates of Internet access compared to rural regions.

We conducted our research in four different countries, Italy, Spain, Ecuador, and Peru.

In Italy, there were 50.78 million Internet users out of a population of 58 million, with approximately 43.18 million individuals using social media. Spain had 45.12 million Internet users out of a population of around 48.2 million, with approximately 40.70 million social media users. In Peru, there were 24.31 million Internet users among a population of 34.19 million, while in Ecuador, 14.72 million people were internet users out of a population of 18 million, with around 13.30 million using social media.

The epidemiology of IA, also known as problematic usage of the Internet (PUI) has gained growing attention in recent years due to its prevalence and impact on public health.

Although IA lacks consistent diagnostic criteria, numerous studies have assessed its prevalence in the population (Cheng & Li, 2014; Li et al., 2018). Some suggest that IA affects anywhere from 0.3% to 38% of the general population (Cash et al., 2012; Moreno et al., 2019). Studies from Asia assign a prevalence of 8.4% for male adolescents and 4.5% for females (Rumpf et al., 2014).

The widely variable prevalence rates may stem from different methodological choices, diverse definitions used, and the fact that this phenomenon is studied differently across cultures. Epidemiological studies on IA differ significantly in methodology and definitions, making it challenging to establish precise prevalence rates.

A global meta-analysis (Cheng & Li, 2014) estimated a global prevalence rate of approximately 6%, with the highest prevalence in the Middle East (10.9%) and the lowest in northern and western Europe (2.6%). Furthermore, IA prevalence was higher in nations with higher internet traffic, elevated pollution levels, and indicators consistent with overall life dissatisfaction.

A more recent study (Laconi et al., 2018) examined the relationship between PUI, time spent online, online activities, and psychiatric disorders in 5593 adult Internet users across nine European countries. This study estimated PUI prevalence between 14.3% and 54.9%, with an average of 25%. The results also highlighted connections with certain psychopathological symptoms, such as problematic Internet users exhibited more obsessive-compulsive symptoms, increased hostility,

paranoid beliefs, and anxiety. Subjects appeared to be more sensitive, irritable, and impulsive compared to regular users, potentially leading them to spend more time online to alleviate their difficulties in managing unpleasant emotional experiences (Laconi et al., 2018).

Rumpf (2018) estimated that in Europe, prevalence for IA ranges from 0.2% to 11.8% for IA and from 2.8% to 25.1% for risky use. As mentioned, variability in prevalence rates is due to assessment tools, age groups, regions studied, and whether the surveys focused solely on Internet gaming or broader Internet application usage. Disorders are associated with male gender, younger age, mental health problems, and unfavorable social conditions. Prevalence estimates in most European studies show that significant proportions of the population suffer from problematic Internet use, especially among younger age groups (Rumpf, 2018).

It's worth noting that since 2012, many cross-cultural studies on IA have emerged, especially in intercultural regions like Europe (Durkee et al., 2012; Tsitsika et al., 2014). These studies, usually based on school populations, have shown an estimated prevalence of Generalized IA between 1% and 4%, with prevalence typically higher in males. There has also been an increase in transnational intercontinental studies (López-Fernández, 2015) concerning Asia, America, and Europe, which have shown higher prevalence rates in Asian countries and among young male users.

In summary, while the epidemiology of IA continues to evolve, it is evident that PUI is a significant public health concern with implications for individuals, families, and society. Prevalence rates of IA can vary depending on factors such as methodology and population studied, here are some approximate figures based on existing research:

- **Age**: Studies suggest that IA is more prevalent among adolescents and young adults, with prevalence rates ranging from 1% to 26% in this age group (Kuss et al., 2014; Pontes et al., 2015).
- **Gender Differences:** Research indicates that IA may be more common among males than females, particularly in the context of gaming disorder. For example, prevalence rates of gaming disorder among males have been reported to range from 1.2% to 27.5%, compared to 0.2% to 13.5% among females (Griffiths et al., 2016).
- **Cross Cultural Differences:** Prevalence rates of IA vary across different countries and regions. For instance, studies have reported prevalence rates of PUI ranging from 1.7% to 26.7% in South Korea, 6.7% to 10.3% in China, and 1% to 18% in Europe (Lin et al., 2019; Pontes et al., 2015).
- **Specific Subtypes:** Different subtypes of IA, such as gaming disorder, may exhibit varying prevalence rates. For example, studies have found prevalence rates of gaming disorder ranging from 0.2% to 14.4% in adolescents and young adults, with higher rates reported among males

compared to females (Griffiths et al., 2016). With the widespread adoption of smartphones, rates of problematic smartphone use, and IA, have been on the rise. Studies suggest that prevalence rates of smartphone addiction may range from 10% to 30% in various populations, with higher rates reported among younger age groups (Lin et al., 2019).

Given these premises, our research project aims to explore the relationship between the development of dysfunctional behaviors related to Internet use and digital era disorders and various psychological variables (such as FoMO, emotional dysregulation, impulsivity, personality traits, prosocial behaviour), as well as social factors (gender and cultural differences). By considering these factors, we seek to gain a deeper understanding of the complex interplay between individual psychological characteristics, social dynamics, and PUI.

Furthermore, the following chapters will offer detailed explanations regarding the influence of personality variables, subtypes of IA, digital era disorders, and the impact of social and cultural factors on the development and spread of this phenomenon.

2. The digital era disorders

2.1. Social Media Addiction (SMA)

Social media are a wide range of tools, including software and applications, that allow users to share and create content, whether it be images, videos, audio, or text.

As a result of the technological revolution in recent years, the way of information and communication are changing. More and more people choose to communicate and get in touch through these digital platforms, online videogames, e-mail, etc... Smartphones and social media have had a significant impact on people's lives (Abeele et al., 2016), greatly changing the way people communicate and interact. Nowadays, the worldwide social media diffusion rate is 62.3 percent. Northern Europe led the global ranking for social media usage by region with an 81.7 percent penetration rate. In contrast, Eastern and Middle Africa ranked at the bottom of the list, with usage reach figures of 10.1 percent and 9.6 percent, respectively (Global daily social media Usage, 2024).

In the last three years, the use of social media has significantly increased during the lockdown due to Covid-19 pandemic emergency. Many people used social media to relieve their sense of loneliness and to regulate emotional experiences (Cauberghe et al., 2021; Fernandes et al., 2021).

In some cases, social media are very useful tools, but the perception of the necessity to be online can lead to compulsive use of social media, which in extreme cases can cause symptoms and consequences traditionally associated with substance abuse disorders. Indeed, there is growing scientific evidence suggesting that excessive social media use can lead to symptoms traditionally associated with substance addictions (Sampasa-Kanyinga et al., 2022; Elhai et al., 2021). Since the publication of the first literature review on empirical studies regarding SMA (Kuss & Griffiths, 2011), the scientific community's interest in this issue has significantly increased.

The SMA is defined as "the inability to regulate the use of social networks, resulting in negative personal and interpersonal effects" (Larose et al., 2014), accompanied by an unstoppable and uncontrollable urge to access them (Ünal; 2020). It is mainly manifested through the constant monitoring of accounts (Instagram, Facebook, Twitter).

There are numerous models offering explanations for the development of SMA (Turel & Serenko, 2012), likely favored by an integration of dispositional, behavioural, sociocultural, and reinforcing factors (Andreassen & Pallesen, 2014; Griffiths et al., 2014; Shaffer et al., 2000).

Individuals affected by SMA exhibit a series of symptoms including (Zhou & Cheng, 2022):

- Preoccupation with social media use, defined as the person's tendency to spend a lot of time on social media and to try in every way to find out moments to be connected.

- Development of tolerance whereby the person experiences an increasing urge to stay connected and therefore will tend to spend more and more time on social media to achieve a state of well-being.
- Inability to stop using these tools despite the negative consequences that result.
- The development of a true withdrawal, as if there were an impossibility to use social media, the person would show states of irritability, agitation, or discomfort (craving).
- Mood alterations, when the use of social media is carried out as a coping strategy to reduce and avoid unpleasant moods and emotions.
- Impairment of functioning in important areas of one's life, especially in the socio-relational domain.

For a small minority of individuals, the use of social media can become the most important activity they engage in, leading to preoccupation and planning regarding social media use (salience). Activities on these platforms are then used to induce mood alterations, pleasant feelings, or a numbing effect (mood modification). Increasing amounts of time and energy are required to be involved in social media activities to achieve the same feelings and mood states experienced during initial usage (tolerance). When social media use is interrupted, individuals may experience negative psychological and sometimes physiological symptoms (withdrawal), often leading to a reinstatement of problematic behaviour (relapse). Problems arise as a consequence of engagement in the problematic behaviour, leading to intrapsychic problems (conflicts within the individual often including a subjective loss of control) and interpersonal conflicts (i.e., issues with the immediate social environment including relationship and work and/or education problems being compromised). Social media addicted individuals often use these platforms so much that it negatively impacts their health, sleep quality, relationships, and personal well-being.

Following the Bio-Psycho-Social model, several studies (Gong et al.; 2021; Fabris et al.; 2020) have found a positive correlation between SMA and a range of physical, psychological, and relational consequences.

Regarding physical consequences, it has been observed that:

- Social networks, particularly the act of receiving likes or other forms of approval typical of these applications, activate specific areas of the brain, including the so-called nucleus accumbens, involved in the reward and gratification system and playing a fundamental role in maintaining the addiction itself (Shannon, 2022).
- Excessive use of social media is associated with numerous sleep disorders, especially in the adolescent population (Sümen; 2021).

Among the most significant psychological and cognitive consequences are (Ophir et al.; 2020):

- Increased likelihood of developing anxiety disorders and depressive disorders.
- Increased levels of stress.
- Subjective feelings of inadequacy, insecurity, and low self-esteem.
- Dysfunctional thoughts about oneself and others.
- Difficulty in concentration and maintaining attention.
- Alteration of temporal perception.

Regarding relational problems, the most important ones include (Dalvi-Efasani et al.; 2021):

- Impoverishment of interpersonal relationships.
- Tendency towards isolation.
- Tendency to substitute the real world with the virtual one.
- Decrease in prosocial skills.
- Excessive preference for virtual relationships can affect face-to-face communication and interaction (McDaniel et al., 2018). The main issue of an excessive online communication is that the absence of non-verbal language, facial expressions, gestures, etc. could impact on the development of some regulatory competencies. For instance, people's recognition of their own and others' emotions could be negatively affected (Goleman, 1995).

There are also a series of dangers closely related to the use of social media, including (Shafi et al.; 2021):

- Increased likelihood of being victims of cyberbullying.
- Probability of being targeted by unknown and older individuals.

Social media can be used and perceived very differently across generations (Teo & Lee, 2016), so it is important to consider various variables to define as addicts those users who approach social media excessively. It is possible that habitual use by adolescents could be "pathologized" even though it does not cause significant harm in any area of the individual's life (Griffiths, 2010). In the field of research, there are many controversies regarding both the possible "hyperpathologization" of everyday life experiences (Billieux et al., 2015; Kardefelt-Winther et al., 2017) and the difficulties in defining the phenomenon more appropriately. On the one hand, current research on behavioral addictions tends to be correlational and confirmatory in nature, often relying on general population studies rather than clinical samples where psychological alterations are observed (Billieux et al., 2015). On the other hand, authors addressing this issue still do not distinguish between actual addiction, compulsion, problematic social media use, or other similar labels, as these terms are often used interchangeably. However, despite different authors (Andreassen et al., 2014; Andreassen et al.,

2012; Griffiths et al., 2014) suggest considering an excessive and compulsive use of social media as a behavioural addiction, this type of issue is not yet formally recognized or incorporated into current psychiatric classifications (APA, 2013).

Thus, social media can represent, although illusorily, an outlet for venting (Bányai et al., 2017). In general, given that the field of research is relatively recent, the studies addressing SMA are characterized by a series of methodological problems. Currently, there are few estimates of the prevalence of SMA, with most studies including small and non-representative samples (Kuss & Griffiths, 2011). Additionally, most studies use various assessment tools, different diagnostic criteria, and different cutoff points, making it difficult to obtain generalizable results (Griffiths et al., 2014).

2.2. Internet Gaming Disorder (IGD)

IGD is the only Internet-related addiction to date and proposed as a condition included in the "conditions for future research" section of the DSM-5 TR (APA, 2022).

In the manual, IGD criteria have been described as follows:

- Persistent and recurrent use of the Internet to engage in video games, often with other players, leading to clinically significant distress as indicated by 5 or more of the following 9 symptoms, for a period of at least 12 months:
- Excessive concern regarding gaming on the Internet.
- Symptoms of distress when not gaming or when unable to play (withdrawal).
- Tolerance, meaning the need to increase the time spent gaming.
- Numerous, unsuccessful attempts to reduce Internet gaming.
- Loss of interest in previously enjoyable activities.
- Excessive use of games despite awareness of the psychosocial problems it causes.
- Deception about the amount of time spent gaming (lying about gaming time).
- Using gaming to alleviate negative mood.
- Exposing relationships, work, and educational opportunities to risk due to gaming on the Internet.

Recently, IGD has been included in the latest version of the International Classification of Diseases (ICD-11) in the "disorder due to addictive behaviour" section (Reed et al., 2018). In the ICD-11, defined as a behavioral pattern related to gaming (digital games and/or video games) characterized, over a period of at least 12 months, by:

- Lack of control over gaming compared to other activities.
- Prioritizing gaming over other interests and daily activities.

- Increasing gaming sessions despite negative consequences.

Additionally, for the disorder to be diagnosed, this behavioral pattern must significantly impair the personal, familiar, social, educational, and work functioning of the individual.

Prevalence rates for IGD vary based on several variables, including cultural context, family environment, psychosocial factors, and comorbidities with other pathologies (WHO, 2015). More than 60 epidemiological studies on the general population and subgroups have been reported in the international scientific literature (WHO, 2015).

Chern et al. (2018) have found that the disorder appears to be more prevalent in males, particularly among adolescents and young adults. Also, in East and Southeast Asia, there is a prevalence of IGD ranging from 10 to 15% in the population (Achab et al., 2015), while in European and North American countries, the prevalence of IGD varies from 1 to 10% of the population (Saunders et al., 2017).

Understanding the underlying causes of IGD, like other disorders and forms of addiction, is not easy. Additionally, it's important to consider this disorder as a form of maladaptive coping by individuals to deal with their negative and unpleasant experiences.

Numerous studies have identified a series of risk factors at individual, environmental, and neurobiological levels (Macur & Pontes., 2021, Gentile et al., 2011).

Regarding individual risk factors, it has found that individuals with high level of impulsivity, Neuroticism, reduced conscientiousness, low extraversion and tendency toward social withdrawal, poor self-control, anxiety and depression and ADHD, would appear to have a bidirectional influence on excessive gaming.

Family-related risk factors are also significant. In this regard, Grajewski et al. (2020) have found that there is a correlation between Adverse Childhood Experiences (ACE) and the development of IGD. An insecure attachment style can lead to the development of a video game addiction.

Regarding neurobiological risk factors, Hwang et al. (2020) pointed out that there is an alteration in the functioning of specific brain areas, including the "reward circuit" and the frontal striatal circuit involved in response inhibition and in neurotransmitter production, particularly dopamine.

Video game addiction can lead to a series of negative consequences at physical, psychological/cognitive, and relational levels.

Physically, the most reported issues include eye pain and dryness; carpal tunnel syndrome, head and neck syndrome, tendinitis; headache; sleep-wake rhythm disturbances, joint pain; weight fluctuations (Adamczyck, 2019).

Psychological and cognitive consequences include increased irritability; increased likelihood of developing symptoms of anxiety and depression; higher levels of psychological distress; attention and concentration difficulties; memory deficits; decline in academic performance (Wong et al., 2020).

Macur and Pontes (2021) observed some relational consequences associated with excessive online gaming, such as a greater tendency toward isolation and a decrease in live social relationships and an increase in virtual ones.

In this regard, it's as if individuals with video game addiction develop a form of attachment and identification with their online avatar. This would lead to a gradual substitution of offline relationships with virtual ones.

2.3. Fear of missing Out (FoMO)

FoMO refers to the intense discomfort triggered by the concern that friends or others may be experiencing gratifying experiences from which one is absent (Przybylski et al., 2013; Elhai et al., 2020; Alt, 2015). It is the fear of being left out, the constant thought that others are doing something more interesting and rewarding than oneself, and that one is missing out. It is characterized by the desire to remain socially connected and may manifest as a form of social anxiety (Anderson, 2011). Wegmann et al. (2017) suggested that FoMO is not a unitary phenomenon, but a complex construct reflecting both a personal predisposition and a specific cognition regarding the FoMO on a particular event. Although the theoretical construct of FoMO does not explicitly refer to a specific context (i.e., online, offline). Several studies have applied the construct to the online context (Przybylski et al., 2013; Gil et al., 2015). Furthermore, FoMO has been found to be associated with a variety of psychopathological symptoms, including social isolation, depression, and anxiety (Blackwell et al., 2017; Dhir et al., 2018; Elhai et al., 2020; Scalzo & Martinez, 2017; Oberst et al., 2017). Self-Determination Theory (SDT, Deci & Ryan, 1985), a macro-theory of human motivation, provides a useful perspective for framing an empirical understanding of FoMO. According to SDT, self-regulation and psychological health are based on the satisfaction of three basic psychological needs:

- Competence: the ability to effectively act on the world.
- Autonomy: authorship or personal initiative.
- Relatedness: closeness or connection with others.

Research conducted in sports (Hagger & Chatzisarantis, 2007), educational (Ryan & Deci, 2000), and gaming (Przybylski et al., 2009) contexts indicates that satisfaction of these basic needs is strongly associated with behavioral regulation. Through this theoretical framework, the phenomenon of FoMO can be understood as a kind of "self-regulatory limbo" (Przybylski et al., 2020), stemming from situational or chronic deficits in the psychological satisfaction of basic needs. Furthermore, it has been suggested that individuals with higher levels of FoMO may enter a cycle of behaviors seeking reaffirmation of their identity and self-esteem by spending increasing amounts of time online, which in turn can lead to further FoMO on gratifying experiences (Casale et al., 2014; Oberst et al., 2017;

Franchina et al., 2018), increased self-disclosure, and friendly behaviors, and ultimately further decreases in social and psychological well-being (Przybylski et al., 2020).

Indeed, several studies have linked FoMO to the overuse of SM (Blachnio & Przepiórka, 2018; Dempsey et al., 2019; James et al., 2017; Varchetta et al., 2020), which may be considered ideal for satisfying the "desire to stay continuously connected to what others are doing" (Przybylski et al., 2013, Elhai et al., 2016). In fact, FoMO-related overuse of social media (Przybylski et al., 2013, Alt, 2015) may manifest in the problematic use of smartphones (Clayton et al., 2015). The excessive use of such platforms can also affect sentimental and sexual sphere. If abused, online sexual practices, such as sexting, visiting to pornographic sites, using dating apps etc… can result in maladaptive and potentially harmful practices (e.g. Cyber Sex Addiction), lead to social retirement (Porcelli et al., 2019), to discomfort and distress experiences in real interactions (Cotter et al., 2018). As a result of an excessive online activity, users can also be more vulnerable to experience risk situations for them reputation (e.g., critical and/or offensive comments; sexual or violent content; online stalking), affecting their psychological and physical well-being (Varchetta et al., 2020; Buglass et al., 2017). FoMO has two behavioral manifestations: one external, consisting of social surveillance, regular participation in social events or control of social media, and one internal, expressed by a strong desire to know what others are doing (Chai et al., 2018).

Referring to the framework of SDT (Deci & Ryan, 1985; Ryan & Deci, 2000), to date, the literature has mainly focused on FoMO as a mediator, connecting deficits in psychological needs to negative social media usage (Przybylski et al., 2020; Alt, 2015) and academic motivational styles (Alt, 2015). Specifically, these studies have found that individuals showing higher levels of FOMO tend to have an unhealthy relationship with social media usage (Przybylski et al., 2020). For example, it has been observed that these individuals are more likely to check text messages while driving and tend to use Facebook immediately upon waking up, just before going to bed, and during college lectures (Przybylski et al., 2020, Varchetta et al., 2020). However, FoMO can have implications beyond social media usage and academic motivation. One possibility is that FOMO may be a contributing factor to increased alcohol consumption and more negative alcohol-related consequences in college students (Martens et al., 2008; Simons & Gaher, 2005). Large social events and alcohol consumption go hand in hand in college (Riordan et al., 2019; Sher et al., 2001; Carey, 1995). Given that those who score higher in FoMO tend to check social media sites more regularly, they may be exposed to more social events involving alcohol abuse. Furthermore, these same individuals may also have stronger social or conformity motives to consume alcohol, such as drinking to be accepted and to avoid feeling excluded. In other words, to avoid missing out on seemingly gratifying experiences, individuals with

high levels of FoMO may be more willing to engage in risky social situations (e.g., attending parties in unknown locations).

Another important dimension of FoMO concerns its potential connections with health and psychological well-being. Turkle (2017) hypothesizes that the "tethered self" provided by always-on communication technologies can distract us from important social experiences in the present. Furthermore, she suggests that a strong desire to remain constantly connected is potentially dangerous as it encourages people to obsessively monitor their "digital lives," even when engaged in activities that require a certain level of concentration, negatively impacts mood and can lead to depressive feelings that may undermine the sense of making satisfactory life decisions (Wortham, 2011; Ellison et al., 2007).

2.4. Nomophobia (No-Mobile Phone Phobia)

In the past decade, research evaluating problematic and potentially addictive use of mobile phones (including smartphones) has significantly increased (López-Fernandez et al., 2015), suggesting that some individuals may develop dependency-related problems because of their mobile phone use. Recent studies (Billieux et al., 2015, Panova & Carbonell, 2018; Elhai et al., 2019) have observed that a smartphone addiction model may be characterized using specific applications, including calls, instant messaging, and social networking. This indicates that rather than being an inherently addictive medium, mobile technologies including smartphones and tablets are mediums that enable engagement in activities that potentially can induce addiction, including social networking. In other words, as Kuss and Griffiths (2017) argue, it can be asserted that "smartphone addicts are addicted to their phones like alcoholics are addicted to bottles."

Indeed, the use of social media is a particularly widespread activity on smartphones, with approximately 90% of social media being used via mobile technologies (Percent of social media Time Now Spent on Mobile Devices, 2024). Therefore, it can be argued that smartphone addiction may be part of SMA. Andreassen et al. (2016) supported this assumption by specifying that social networking often occurs via phones, which may contribute to its potential addiction. Therefore, a nomological distinction between the two types of issues is necessary for the benefit of patients seeking help in professional contexts and for research that will help develop effective therapeutic approaches (Kuss & Griffiths, 2017).

The term Nomophobia is a neologism arising from the combination of the words "no-mobile-phone" and "phobia." It first appeared in Great Britain in 2008, following a survey conducted by the British Post Office regarding users' relationship with their mobile phones: 53% of respondents reported feeling anxious when they did not have their phone with them. Nomophobia has been defined as the

"fear of being without one's mobile phone" (Bragazzi & Del Puente, 2014). Researchers have requested that this disorder be included in the DSM-5 and have outlined the following criteria to help define this constellation of problems (Bragazzi & Del Puente, 2014):

- Regular use of the smartphone for a considerable amount of time.
- Feelings of anxiety when the phone is unavailable (repeatedly checking one's phone, sometimes leading to the phenomenon of phantom ringing: the sensation of hearing notification tones or false phone calls).
- Constant availability of the smartphone.
- Preference for mobile communication over face-to-face communication.
- Financial problems as a consequence of use.

Like FoMO, Nomophobia is a disorder predominantly observable in adolescents and young adults (Darvishi et al., 2019), with a range of prevalence from 6% to 73% between different countries. However, there are no uniform criteria to determine the prevalence of nomophobia (León-Mejía et al., 2021; Humood et al., 2021) due to the difficulties to assess general populations.

In the last few years, the COVID-19 pandemic has contributed to extend usage of these devices, and these data are anticipated to increase even further. Nomophobia is inherently related to the fear of not being able to engage in real social relationships and a preference for online social interaction (Kuss & Griffiths, 2011). Furthermore, it has been linked to PUI and the negative consequences resulting from excessive technology use (Caplan, 2003), further underscoring a strong association between SMA symptoms and those of Nomophobia.

The use of mobile phones leads to changes in daily life habits and perception of reality, which can be associated with some psychosocial issues, such as compromised social interactions, social isolation, and both somatic and mental health problems, including anxiety, depression, and stress (Bragazzi & Del Puente, 2014; Kuss et al., 2017). Consequently, Nomophobia can lead to impulsive mobile phone use (Bragazzi & Del Puente, 2014) and contribute to the development of SMA as it can facilitate repeated use of social media sites, cementing habits that can increase overall vulnerability to experiencing those symptoms associated with addiction as a consequence of problematic use of social networks.

2.5. Phubbing (Phone-Snubbing)

In May 2012, the advertising agency behind the McCann Melbourne campaign (Dumb ways to die), with the help of the University of Sydney, introduced the term Phubbing for the first time to represent a growing problem of smartphone abuse in social situations (Pathak, 2013).

It is a syncretic neologism created at the University of Sydney in 2012, composed of the words phone and snubbing, describing the act of snubbing someone in a social setting by focusing on one's phone instead of directly talking to the person nearby (Chotpitayasunondh & Douglas, 2016). This behavior disregards the expected interactions or attention based on the context and social conventions. In 2013, "www.stopPhubbing.it" was launched, the website of the anti-Phubbing campaign. Initially credited to an Australian college student named Alex Haigh, it was later employed by McCann. The website exposes the negative aspects of Phubbing through simple examples and satirical cartoons. Among the contents is the hall of shame of Phubbing, a bulletin board with photos of people absorbed in their phones in various poses or capturing their unaware friends, also engrossed in Phubbing activity. This phenomenon seems to have become normative in everyday communication (Chotpitayasunondh & Douglas, 2016). Estimates of countries where Phubbing phenomena are most prevalent indicate that the United States ranks first with New York and Los Angeles, followed by Europe with London and Paris, and then Asia with Hong Kong.

Ranie & Zickuhr (2015) reported that 90% of respondents use their smartphones during social activities. The same participants perceive themselves as victims of Phubbing in 86% of their social interactions. Several studies have analyzed the potential harmful effects of Phubbing on the development of individuals' interpersonal relationships (Chotpitayasunondh & Douglas, 2016; Miller-Ott & Kelly, 2017). Specifically, Phubbing may affect each other's first print and can reduce the quality and satisfaction of interpersonal relationships and communications (Chotpitayasunondh & Douglas, 2018a; Gong et al., 2019).

Phubbing can also lead people to perceive lower quality and less satisfaction with their interactions (Ranie & Zickuhr, 2015; Abeele et al., 2016); lower trust in their partner (Cameron & Webster, 2010); feeling less close to their partner when a phone is present in the surrounding environment (Misra et al., 2014); increased feelings of jealousy (Krasnova et al., 2016); and a decrease in mood (Roberts & David, 2016). Moreover, it has been observed how Phubbing phenomena can increase couple conflicts, especially in people with an anxious attachment style (Roberts & David, 2016). The most important aspect highlighted by researchers is that the phenomenon may indirectly impact the development of depressive disorders. Furthermore, in the study by Roberts and David (2016), about half of adult respondents reported being subjected to Phubbing by their romantic partners.

Current research has observed that Phubbing seems to be linked to high levels of neuroticism, excessive use of social media, high levels of FoMO and depression, difficulty in impulse regulation. These variables could represent risk factors for the implementation of Phubbing behaviors (Gong et al., 2019).

Regarding the antecedents of Phubbing behavior, research is still in its early stages, and there is much to discover. However, the most important determinant appears to be smartphone addiction (Chotpitayasunondh & Douglas, 2016; Karadağ et al., 2015), and is influenced by several factors, such as excessive Internet use, technology addictions (social media, smartphones, etc.), lack of self-control, social anxiety, and trait anxiety (Chotpitayasunondh & Douglas, 2016, Franchina et al., 2018; Guazzini, et al., 2019).

Phubbing characteristics, such as lack of eye contact, can be further interpreted (even erroneously) as "silent treatment" or a form of social withdrawal (Wirth et al., 2010). Altered gaze is a passive form of social exclusion (Wirth et al., 2010) and an evident sign of disinterest (Richmond et al., 2008).

Phubbing, showing many of the common characteristics of social exclusion, seems to have negative effects on people's satisfaction of social needs and moods. The smartphones, originally intended to connect, instead of being a social tool, is becoming a sort of virtual and psychological barrier that weakens human relationships at the expense of virtual ones.

3. The influence of psychological factors on Internet Addiction (IA)

3.1. Emotional (Dys)regulation and IA

Emotional regulation refers the abilities to modulate emotional excitement, be aware, understand and accept one's own and others' emotions, as well as the ability to act in the world without being influenced by one's own emotional state (Gratz & Roemer, 2004). Dysregulated emotional responses may foster addictive behavior as a means of coping with high levels of stress. Specifically, studies of opioid (Aguilar de Arcos et al., 2008), cocaine (Decker et al., 2016; Potenza et al., 2012), methamphetamine (Morales et al., 2011; Uhlmann et al., 2016), alcohol (Le Berre, 2019; Schulte et al., 2009) and tobacco (Engelmann et al., 2011; Versace et al., 2014) misuse have shown a close link between addiction and emotional dysregulation. Furthermore, the role of emotional (dys)regulation and alexithymia, often conceptualized as emotional regulation disorder (Taylor, 1994), has also been investigated in Internet–related addictions (Marchetti et al., 2019; Scimeca et al., 2014; Bonnaire & Baptista, 2019). Again, emotional (dys)regulation has been found to strongly correlate with the severity of these behavioral addictions (Roger & Velotti, 2018). Studies have also shown that individuals with both emotional (dys)regulation and alexithymia experience difficulties developing healthy relationships, due to their problematic management of emotional states, and consequent mood disorders. Such individuals may consider the Internet an arena in which they can achieve greater self-control and engage in better communication with others (Scimeca et al., 2014).

The Internet enables users to connect with others, discover new worlds, acquire new knowledge, and create positive emotions (e.g., happiness, fun, satisfaction). Therefore, IA might reflect an individual's attempt to cope with and escape from negative emotions in everyday life and promote more positive affect. However, the positive emotional reinforcement that may arise from use of the Internet can easily produce an imbalance, leading to abuse or overuse (Longstreet et al., 2019). Indeed, a study by Longstreet et al. (2019) showed that IA increased negative and decreased positive emotional states; this suggests that the positive emotional reinforcement that can stem from use of the Internet may encourage continued Internet use.

In fact, many studies have shown that higher levels of emotional (Dys)regulation were associated to problematic use of the Internet (Casale et al., 2016; Estévez, et al., 2017; Spada & Marino, 2017; Yu et al., 2013), video game addiction (Estévez et al., 2017) or excessive use of social media (Hormes et al., 2014). Internet gaming addicts also have a brain structure that resembles deficits in emotional and social skills (Dieter et al., 2017) and impaired prefrontal cognitive control over emotional interference (Lee et al., 2015). For instance, in a sample of adolescents, IA was strongly correlated with a reduced ability to understand emotional reactions, control impulsive behavior in response to negative

emotional experiences, and use effective emotional regulation strategies (Karaer & Akdemir, 2019). The use of IA as an escape behavior and manner of coping with emotional difficulties and stressful events has also been confirmed in a sample of young adults: Pettorruso et al. (2020) showed that the presence of emotional problems, especially in young adults with low novelty-seeking, predicted the development of problematic social interaction (i.e., PUI), leading to detachment from reality. Moreover, the preference for online communication, characterized by the absence of non-verbal language, facial expressions, gestures, etc. could increase the risk, especially for young people, of not reaching full emotional maturity and presenting problems of emotional illiteracy, among the indicators probably responsible for some typical problems such as bullying, drug addiction and alcoholism (Goleman, 1995).

There are conflicting findings on gender differences in Emotional Regulation, also considering the complexity and multidimensionality of the construct. Bender et al. (2012) observed that females would be more anxious and have more difficulty regulating negative emotions than males.

A study on adolescents found that girls showed greater acceptance and awareness of their emotions, less effective coping strategies and greater difficulty in adopting appropriate coping strategies in situations of emotional distress (Neumann et al., 2010).

In contrast, in the study by Tamres et al. (2002), females reported using more strategies than males, including reappraisal, active coping (or problem-solving), acceptance, and social support. Overall, research on gender differences in the ability to regulate emotions provides ambiguous results.

Despite this empirical evidence of the role of emotional dysregulation in addictive behavior, many questions remain. It is not yet known whether emotional dysregulation is a cause, correlation, or consequence of addictive behavior.

3.2. Personality traits and IA

The “Big Five” theory (Costa & McCrae, 1992) represents the most widely accepted theory in explaining human behaviour in several domains, including the tendency to abuse or not abuse the Internet (Wang et al., 2015). The "Big Five" theory categorizes personality into five core dimensions:

- Extroversion: Reflects sociability, energy, and assertiveness.
- Agreeableness: Indicates cooperation, trust, and empathy.
- Conscientiousness: Measures self-discipline, organization, and goal orientation.
- Neuroticism: Relates to emotional stability.
- Openness to Experience: Reflects creativity, curiosity, and willingness to embrace new ideas.

This model is commonly used to assess personality across different settings and cultures due to its reliability and universal application.

Research has demonstrated a strong relationship between personality and IA, as well as behavioral addictions, more generally (Andreassen et al., 2013; Grant et al., 2010; Kayis et al., 2016; Weibel et al., 2010). In this context, several studies have investigated the influence of the "Big Five" personality traits (Costa & McCrae, 1992) on Internet behavior. Such studies have found that conscientiousness—defined as the propensity to "follow socially prescribed norms for impulse control, to be goal-oriented, to plan and to be able to delay gratification and to follow norms and rules" (Roberts et al., 2009)—is negatively associated with excessive social media use (Wilson et al., 2010) and IA (Gnisci et al., 2011). In a similar vein, Andreassen et al. (2013) found that conscientiousness was a protective factor for unproductive behavioral addictions (e.g., addiction to Facebook, video games, or the Internet) and a risk factor for positive or productive behavioral addictions (e.g., an addiction to studying). On the other hand, neuroticism, or the "tendency to experience negative emotional states, characterized by a tendency to worry and be anxious" (Robinson et al., 2007; Yang et al., 2020), has been found to be associated with frequent and unbalanced negative affect in response to stressful circumstances (Yoon et al., 2019). Neuroticism has been found to predict both social media use and IA, especially in studies using age as a covariate (Blackwell et al., 2017). In addition, Ehrenberg et al. (2008) found that individuals high in neuroticism showed stronger mobile phone addictive tendencies and a preference for online communication. Agreeableness and openness to experience have been negatively correlated with PUI (Wilson et al., 2010; Ko et al. 2012; Dong et al. 2013; Kuss et al., 2013; Müller et al. 2014) and with SMA (Błachnio & Przepiorka 2016; Tang et al. 2016).
Recent findings (Akbari et al., 2021; Chew, 2022) showed that conscientiousness, agreeableness, and extroversion are negatively associated with excessive Internet behaviours, such as excessive social media use and IGD, while neuroticism correlates positively with these behaviours.

3.3. Prosocial Behavior and IA

Prosocial behaviour, it is conceptualized as the set of acts/behaviors defined by society and/or one's social group as "generally beneficial to other people" (Penner et al., 2005). Prosociality has been extensively investigated in the literature (Eisenberg & Miller, 1987), and in the offline context, it is associated, for example, with better school performance (Carlo et al., 2018), higher self-esteem (Laible et al., 2004) and subjective well-being, as well as positive affective states (Martela & Ryan, 2016). In the online context, typical prosocial behaviours can be enacted within social media by creating "groups" to give and receive support from informal networks of peers as well as from strangers (Gibson & Trnka, 2020), or on gaming platforms, where people can help each other during gaming activities (Wang & Wang, 2008). Some studies (Kasap et al., 2023; Raggiotto et al., 2023) show a negative correlation between prosocial behaviours and excessive Internet use.

Prosocial behavior seeks to help and bring tangible and intangible benefits to others, reducing the likelihood of engaging in antisocial and aggressive behavior (Martí-Vilar et al., 2019; Rodriguez-Montoya, 2021). Behavioral addictions involve performing core behaviors for individuals, as they become exclusive and significantly affect other daily activities on a physical, mental, and social level. In this regard, people with addiction problems might tend to be less prosocial, suggesting that prosociality might be a protective factor against the development of this kind of addictions (Hernández-Serrano et al., 2016; Paleologou et al., 2019). Indeed, by fostering meaningful interactions and altruistic motives, prosocial behavior can reduce the tendency toward excessive use of the Internet. In addition, Guo et al. (2021) observed that prosocial behaviour reduces the risk of PUI. Lemmens et al. (2015) found that, prosocial behavior negatively correlated with video game addiction in a Dutch sample.

With respect to gender differences, several studies indicate that women tend to be more prosocial than men (Holmgren et al., 1998) and exhibit stronger prosocial morality (Jaffee & Hyde, 2000).

However, the nature and multidimensionality of prosocial behavior must be considered. Indeed, the female behavior is more care-oriented while male behavior is more justice-oriented or task-related (Gilligan, 1993). As Eagly (2009) reported males tend to engage more in physical supportiveness than females. In addition, different forms of prosocial behavior may have different antecedents, motivations, and consequences (Eisenberg & Spinrad, 2014), which means that gender differences will probably vary depending on the kind of prosocial behavior performed.

Despite these data, this construct has been less investigated in the online context, which is distinguished by its different dynamics and characteristics (e.g., absence of face-to-face feedback). These gendered patterns may interact with online platforms differently, affecting how men and women engage with Internet-related behaviors and their susceptibility to addiction.

Future research has the role to further investigate the relationship between prosociality and Internet related addiction.

3.4. Impulsivity and Internet Addiction (IA)

Impulsivity can be defined as a personality trait characterized by difficulty in planning and prediction, reduced perseverance, high sensation seeking and immediate gratification. Impulsivity can also predict loss of control and has often been associated with the onset of addictive behaviors (Blaszczynski et al., 1997). It can play a crucial role in the development and maintenance of addictive behaviors (Cao et al., 2007; Treuer et al., 2001), as IA is also considered an impulse control disorder (Sadock et al., 2000; Shapira et al., 2000). With respect to impulsivity and IA, a study by Cao et al. (2007) has investigated their relationship in a sample of Chinese adolescents. The authors showed

that the IA group was more impulsive than the control group. Similarly, individuals with higher levels of IA were more impulsive than those with lower levels of IA (Choi et al., 2014). In addition, the study by Lee et al. (2012) found that impulsiveness may be a risk factor for IA and pathological gambling.

In the study of impulsivity there is considerable interest in gender differences (Moffitt et al., 2001). Overall, it is well recognized that males exhibit higher levels of impulsivity, as several studies have shown that, from early adolescence, girls tend to exhibit less impulsive behavior than boys (e.g., Burton et al., 1998; Chapple et al., 2005; Chapple & Johnson, 2007). Other studies found no significant differences between males and females on impulsivity (Patton et al., 1995). However, Silverman (2003) suggested that females tend to use more effective strategies to delay rewards, while males would be more impulsive, a strategy that may prove detrimental on the long run.

Finally, impulsivity is a key trait in the development and maintenance of addictions by affecting the decision-making abilities of individuals, causing an overestimation of immediate rewards and/or a reduced evaluation of long-term rewards (Király et al., 2020). Indeed, studies have demonstrated that the reward circuitry is one of the neurocognitive aspects most implicated in both substance and behavioural addictions (Choi et al., 2014; Kale et al., 2018;), including excessive Internet use and IGD (Ioannidis et al., 2019).

4. The influence of socio-cultural factors on Digital Age Disorders

4.1. Gender differences in IA

Several studies investigated the influence of gender on the onset of IA (Hassan et al., 2020; Mari et al., 2022; Pan et al., 2020; Xin et al., 2018).

Male gender has been identified as a risk factor for IA, as reported by several studies (Choi et al., 2015; Hassan et al., 2020; Ostovar et al., 2016; Pan et al., 2020; Sharma et al., 2014; Xin et al., 2018). This is in line with research indicating that females tend to use the Internet predominantly for social interactions (Peris et al., 2020), while males engage in activities more predictive of IA, such as pornography, cybersex, and online gaming (Kiràly et al., 2014; Tsumura et al., 2017).

Furthermore, males seem to show higher scores in online gaming addiction (Spilkova et al., 2017; van den Eijnden et al., 2018). Instead, females seem to use social media more frequently than males (Chae et al., 2017), showing more symptoms of addiction (Varchetta et al., 2020). However, in contrasting results, males scored higher in SMA (Araujo Robles, 2016; Cam & Isbulan, 2012).

Studies on gender differences suggest that males and females share several risk factors for IA, such as impulsivity/sensation seeking (Koo & Kwon, 2014; Mottram & Fleming, 2009), as well as other factors, such as sleep problems (Shen et al., 2021) and attention deficit hyperactivity disorder (ADHD) symptoms (Ko et al., 2012; Lee et al., 2014). However, there are independent predictive factors of IA for females and males. Specifically, factors such as traumatic experiences (Schimmenti & Caretti., 2017), hostility (Ko et al., 2009), frustration intolerance (Kuss et al., 2014), and self-control indicators (Li, Ren, et al., 2021) are associated with IA in males, while alexithymic traits, emotional difficulties, negative mood (Dalbudak et al., 2013; Kandri et al., 2014; Koo & Kwon, 2014; Schimmenti & Caretti, 2017; Shen et al., 2021), and smartphone addiction (Choi et al., 2015) are associated with IA in females. Both males and females, however, may report suicide ideation and insomnia as consequences of IA (Shen et al., 2021).

Despite the high number of studies in the literature on gender differences in IA, many results still appear to be controversial. Therefore, further studies analyzing different variables are necessary to be able to generalize the results.

4.2. Gender differences in IGD and SMA

As previously described, IGD has been defined as the “persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress as indicated by five (or more) of the following in a 12-month period” (APA, 2022).

On the other hand, the term social media includes multiple types of online websites, such as social networks, online chatrooms, and blogs (van den Eijnden et al., 2016). Therefore, SMA has been defined as an "incapacity to regulate the use of social networks, which causes negative effects at the personal and interpersonal level" (Larose et al., 2010; Ryan et al., 2014).

Gender differences regarding Internet users are a potential element that can affect the increase in IA. Although several studies have been conducted to discuss this issue, online gaming addiction seems to be predominant among males (Bouna-Pyrrou et al., 2015; Spilkova´ et al., 2017; van den Eijnden et al., 2018). Compared to females, males typically spend more time playing online games and these findings have been observed in different countries, both in adults (Laconi et al., 2017) and in adolescent samples (Wichstrøm et al., 2019). In contrast, recent studies have suggested that women spend more time on social media than men (Chae et al., 2017). In fact, they seemed to show a greater tendency to experience addictive symptoms associated with social media use (Varchetta et al., 2020) and would thus be more vulnerable to developing SMA (Andreassen et al., 2017). A possible explanation could consist in the fact that when considering IA, men are assessed for online gaming, while women tend to be assessed for social media (Hawi & Samaha, 2019). However, contrasting data suggest that SMA would be prevalent among males. In fact, in some studies, males showed a higher level of SMA than females (Araujo Robles, 2016; Cam & Isbulan, 2012). Thus, further studies are required to deepen our understanding of the relationship between gender IGD and SMA.

4.3. Gender-related differences in Fear of Missing Out (FoMO)

FoMO is defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski et al., 2013). It can be conceptualized as a negative emotional state resulting from the individual's unmet relational needs; thus, individuals with satisfied relational needs should experience lower levels of FoMO (Przybylski et al., 2013). Regarding gender differences, women typically report greater relational satisfaction and engagement in maintaining relationships through social media, which suggests they should experience less FoMO. However, research findings on this topic are mixed. Elhai et al. (2018) demonstrated that FoMO was more strongly correlated with the female gender, aligning with other studies (Beyens et al., 2016; Stead & Bibby, 2017). Conversely, Przybylski et al. (2013) highlighted higher FoMO scores in males with low life satisfaction levels, who exhibited excessive use of social media. Other studies did not find significant gender differences in FoMO levels (Gil et al., 2015; Vallejos-Flores et al., 2018; Rozgonjuk et al., 2021). Overall, while women tend to have greater relational satisfaction, which theoretically should reduce FoMO, empirical evidence suggests that FoMO is often higher in females,

likely due to their intensive social media use. This indicates that other factors, such as the context or individual specific factors, play crucial roles in determining FoMO levels.

In conclusion, studies on the relationship between FoMO and gender differences remain inconclusive. Further research is needed to determine if and how FoMO may vary based on individuals' gender.

4.4. Gender-related differences in Phubbing

Smartphones, as pocket-sized and multidimensional tools, can represent a way to ensure a constant connection with the virtual world, even if this connection creates new problems in real life. The term Phubbing, a combination of the words phone and snubbing, represents an increasing issue of smartphone abuse in social situations (Pathak, 2013). It describes the attitude of snubbing someone in a social environment by focusing on their phone rather than talking directly to the person (Chotpitayasunondh & Douglas, 2016). Gender has been found to play a key role in affecting many behaviors associated with smartphones, such as in the preference for online activities (Ha & Hwang, 2014). In Chotpitayasunondh and Douglas' study (2016), men were more likely to experience Phubbing than women. Furthermore, various studies (Karadağ et al., 2015; Chotpitayasunondh & Douglas, 2016; Błachnio & Przepiorka, 2019) demonstrate that gender can moderate the relationships between Phubbing behavior and cell phone addiction (e.g., social media, gaming, and Internet). Specifically, in the female group, Phubbing correlated with smartphone and SMA, while males, it was more associated with IA and IGD (Roberts et al., 2014). Overall, females showed a higher tendency to use smartphones as facilitators of social interactions, while for the boys, smartphones have predominantly instrumental function (Błachnio & Przepiorka, 2019).

However, only a few studies have explored the potential gender differences in the Phubbing phenomenon, and most have focused on gender differences in nomophobia and problematic smartphone use (Arpaci, 2019; Yildirim et al., 2016). In a survey on the relationship of users with their mobile phone carried out by the British Post Office involving more than 2000 people, 53% of respondents said that they felt anxious when they did not have their phone with them. Thus, Nomophobia (no mobile – phobia) has been defined as the phobia of being left without one's smartphone (Bragazzi & Del Puente, 2014).

In addition, we refer to the notions of smartphone addiction (Casey, 2012; Kwon et al., 2013) or problematic smartphone use (Hassanzadeh & Rezaei, 2011) in situations where individuals excessively use their smartphones while neglecting other important life domains. In this respect, Albursan et al. (2019) observed that females display a higher risk of problematic smartphone use than males. In the same vein, Van Deursen et al. (2015) argued that females spend more time with smartphones, and they experienced higher levels of anxiety if they cannot reach their smartphones.

In line with these data, in the study by Álvarez-Cabrera et al. (2021), girls scored higher than boys in the dimension of not being able to communicate and obsession with their mobile phone. This generates the constant need for people to check their mobile phones more often to verify if any new messages have arrived. On the other hand, males presented altered communication, which is reflected by being more aware of their mobile phone when they are in the company of others, problems in the dialog, and an interruption in communication and in interaction with others, resulting in inadequate management of interpersonal relationships (Álvarez-Cabrera et al., 2021).

However, there are few studies about the phenomenon, which results in issues with not having a solid theoretical foundation and sufficiently clear data.

4.5. The influence of social, cultural and individual context in IA

The widespread of the Internet and related technologies has led to an increase in the overuse of these tools globally. However, specific context and culture would seem to have an influence on behaviours that can lead to the development of addiction (Chen et al., 2017). Social norms and national cultural values, such as risk propensity, level of uncertainty avoidance, preference for face-to-face interaction, concept of time, and gender dynamics, have been identified as factors that can facilitate or hinder the adoption of information technologies, change the way they are used, and the outcomes of such use (Srite & Karahanna, 2006).

For example, concerning Internet use, Nath, and Murthy's (2004) study indicated that cultural specifics, such as uncertainty, avoidance, and masculinity, have a significant impact on Internet adoption in different nations. Culture, however, does not only play a role in the enactment of behaviours but is strongly linked to the expression of certain personality characteristics. A study by Schmitt and colleagues (2007) of 56 nations showed that South American and European countries tend to have higher scores on the dimension of openness, with Chile ranking first among all cultures; however, for other dimensions, such as extroversion, South America, along with Southeast Asia, reports significantly lower scores than Europe.

Regarding the relationship between excessive Internet use and personality variables, it has been shown in the European context that both SMA and IGD, and other dysfunctional behaviours related to the digital context, such as Phubbing, are significantly predicted by emotional dysregulation, low perception of psychological need satisfaction, low self-esteem, specific Big-five personality traits and FoMo (Blanca & Bendayan, 2018; Varchetta et al, 2020; Błachnio et al., 2021). Similarly, in the South American population, FoMo is a significant predictor of forms of technological disorders and behaviours such as Phubbing (Correa-Rojas et al., 2022). However, personality factors associated with Internet use have not been particularly investigated in this context, but rather behavioural

patterns within the digital context, such as immersion, desire to influence others, loneliness, and feelings of belonging (Naranjo-Zolotov et al., 2021).

There is not a large literature about the effect of Marital status and cohabitation on the IA. However, some authors have pointed out that emotional and social states related to loneliness, that occur in different moments of life (Leigh-Hunt et al., 2017) seem to be significantly related to IA. For example, Orsolini et al. (2023) observed that participants with higher levels of PUI shown higher levels of boredom and loneliness. These results have been confirmed in different countries (Liu et al., 2020; Jiang et al., 2018), for young adults and adolescents (Bian & Leung, 2014; Mahapatra, 2019) and during the lockdown due to the pandemic Covid-19 (Alheneidi et al., 2021). However, other studies are not consistent with these results. For example, Aktürk et al. (2018) did not find a significant effect of the loneliness on smartphone addiction.

In summary, a deep more analysis is necessary to better understand the relationship between social and emotional status and the IA.

5. Compendium objectives

Through our research objectives, we anticipate shedding light on several key outcomes:

- **Understanding Psychological Mechanisms:** By investigating variables such as FoMO, emotional dysregulation, impulsivity, and personality traits, we aim to uncover the psychological mechanisms underlying problematic Internet use. This exploration will provide insights into the cognitive and emotional processes that contribute to the development and maintenance of IA.
- **Exploring Social Influences:** By examining gender and cultural differences, we aim to elucidate how societal norms, cultural values, and socialization processes impact Internet use behaviors. Understanding these social influences can help tailor interventions and support systems to address specific needs within diverse populations.
- **Identifying Protective and Risk Factors:** Through the exploration of prosocial behavior, some personality traits and emotional regulation abilities, we aim to identify potential protective and risk factors against problematic Internet use. By highlighting these factors, our research can inform preventive measures and interventions aimed at promoting healthy Internet habits.
- **Informing Intervention Strategies:** By integrating findings from psychological and social variables, our research aims to inform the development of effective intervention strategies for addressing IA.

To achieve this, we implemented five different studies, each with its own specific objectives, which will be described in the following paragraphs.

5.1. First objective

The present study aimed at investigating the relationships between IA and variables identified in the literature as related to this construct (i.e., SMA, FoMO, difficulties in emotional regulation, personality traits) in an Italian sample. Specifically, the hypotheses were as follows:

- **Hypothesis 1 (H1).** The following correlations identified in the literature would be verified:
  1. Positive correlation between IA and variables related to problematic social media use.
  2. Positive correlation between IA and emotional (dys)regulation.
  3. Correlation between IA and personality traits; in particular, a positive correlation with neuroticism and a negative correlation with conscientiousness.
- **Hypothesis 2 (H2).** There would be a direct positive effect of emotional (dys)regulation (the independent variable) on IA (dependent variable).
- **Hypothesis 3 (H3).** There would be an effect of the independent variable on the proposed mediator and an effect of the proposed mediator on the dependent variable and an effective mediation model could be established including neuroticism and conscientiousness as covariates.

Quaglieri, A., Biondi, S., Roma, P., Varchetta, M., Fraschetti, A., Burrai, J., Lausi, G., Martí-Vilar, M., González-Sala, F., Di Domenico, A., Giannini, A. M., & Mari, E. (2022). From Emotional (Dys)Regulation to Internet Addiction: A Mediation Model of Problematic Social Media Use among Italian Young Adults. *Journal of Clinical Medicine*, *11*(1), 188. https://doi.org/10.3390/jcm11010188

5.2. Second objective

The aim of this research is to investigate the relationships between the so-called addictions of the digital age such as IA and SMA, some sociodemographic (e.g., gender, marital status and cohabitation) and psychological variables that could influence the onset of these disorders (e.g., FoMO, difficulties in emotional regulation, personality traits). Specifically, to ensure consistence to the previous research, we wanted to replicate the first study considering a Spanish sample. This provided a unique opportunity to analyze these variables within the two cultural contexts directly tied to my academic environment. Additionally, given the cultural similarities between the two countries—such as shared values, comparable societal structures, and internet usage habits—the goal was to explore whether the patterns observed in one cultural setting could be replicated and validated in a closely related, yet distinct, socio-cultural environment. Therefore, we made some hypothesis:

- **Hypothesis 1 (H1)**. Correlations between variables:
  1. Positive correlation between IA and variables related to problematic social media use (SMA and FoMO).
  2. Positive correlation between IA and emotional (dys)regulation.
  3. Positive correlation between SMA and emotional (dys)regulation.
  4. Correlation between IA and SMA and personality traits; in particular, a positive correlation with Neuroticism dimension and negative correlation with Conscientiousness dimension.
- **Hypothesis 2 (H2):** There would be a total positive effect of emotional dysregulation (independent variable) on IA (the dependent variable).
- **Hypothesis 3 (H3).** There would be an effect of the independent variable on the proposed mediator (FoMO and SMA) and an effect of the proposed mediator on the dependent variable (IA); and an effective mediation model could be established including neuroticism, conscientiousness, gender, marital status, and cohabitation as covariates.

Varchetta, M., González-Sala, F., Mari, E., Quaglieri, A., Fraschetti, A., Cricenti, C., Giannini, A.M., & Martí-Vilar, M. (2023). Psychosocial risk factors of technological addictions in a sample of Spanish University students: the influence of emotional (dys) regulation, personality traits and fear of missing out on internet addiction. *Psychiatry Research*, *329*, 115518. https://doi.org/10.1016/j.psychres.2023.115518

5.3. Third objective

Recently, interest in gender differences in IA has increased considerably, highlighting a different role of gender depending on the subtype of IA. However, conflicting results have left the relationship between the gender of users and Internet addictive behaviors unclear. Moreover, the relationship between gender and FoMO and Phubbing, have been poorly studied.

The aim of this study is to offer further insights into the difference between males and females in their approach to using online platforms and possibly to understand whether such behaviors can be explained by some psychological variables, such as impulsivity, tendency to engage in prosocial behaviors, and ability to regulate and recognize one's emotional responses.

We want to investigate possible gender differences in IA-related variables within an Italian sample. In particular, we expected:

- **Hypothesis 1. (H1).** Significant differences between males and females in IA, SMA, FoMO, Phubbing, and psychological variables. In particular:
  1. Females demonstrate higher levels of IA.
  2. Males demonstrate higher levels of IGD, and females demonstrate higher levels of SMA.
  3. Females demonstrate higher levels of FoMO.
  4. Males show a mayor tendency to suffer the condition of Phubbing.
  5. Females show higher levels of Prosociality.
  6. Males demonstrate higher levels of Emotional Dysregulation and Impulsivity.
- **Hypothesis 2. (H2).** Significant correlations between IA, SMA, and the investigated variables depending on gender.
- **Hypothesis 3. (H3).** The investigated variables will be predictors of IA in male versus female groups.

Mari, E., Biondi, S., Varchetta, M., Cricenti, C., Fraschetti, A., Pizzo, A., Barchielli, B., Roma, P., Vilar, M. M., Sala, F. G., Giannini, A. M., & Quaglieri, A. (2023). Gender differences in internet addiction: A study on variables related to its possible development. *Computers in Human Behavior Reports*, *9*, 100247. https://doi.org/10.1016/j.chbr.2022.100247

5.4. Fourth objective

Building upon the prior study conducted by Mari et al. (2023) that investigated gender differences in IA within an Italian sample, this research aims to extend the inquiry by examining similar relationships in a Spanish sample. In light of conflicting results and gaps in understanding the associations between gender and Internet addictive behaviors, this study seeks to provide additional insights. Specifically, it focuses on unraveling possible gender differences in various IA-related variables, such as the impact of psychological factors like impulsivity, pro-social behaviors, and emotional regulation and recognition. That is precisely why we aim to replicate the hypotheses of the previous study, reinforcing the robustness of its findings. By applying similar hypotheses to a Spanish sample, we strive to validate and build upon the existing knowledge regarding gender differences in IA, SMA, FoMO, Phubbing, and various psychological variables. This replication adds depth to the understanding of these relationships, contributing to the broader context of cross-cultural research in this domain.

Main Hypotheses:

- **Hypothesis 1 (H1):** There will be significant differences between males and females in various aspects of Internet-related behaviors and psychological variables. Specifically:
  1. Males are anticipated to exhibit higher levels of IA.
  2. Males are expected to display higher levels of IGD, while females are predicted to have higher levels of SMA.
  3. Females are expected to demonstrate higher levels of FoMO.
  4. Females are hypothesized to exhibit a greater tendency to experience Phubbing.
  5. Females are anticipated to demonstrate higher levels of Prosociality.
- **Hypothesis 2 (H2):** We anticipate significant correlations between IA and the examined variables, with variations based on gender.
- **Hypothesis 3 (H3):** The variables under investigation are expected to serve as predictors of IA within distinct male and female groups.

Varchetta, M., Tagliaferri, G., Mari, E., Quaglieri, A., Cricenti, C., Giannini, A.M., & Martí-Vilar, M. (2024). Exploring Gender differences in Internet Addiction and Psychological Factors: A Study in a Spanish Sample. *Brain Sciences*, *14*, 1037. https://doi.org/10.3390/brainsci14101037

5.5. Fifth objective

This study aims to explore the relationships between problematic Internet use and associated psychological variables across diverse cultural contexts, focusing on Italy, Spain, Ecuador, and Peru. Research questions and Hypothesis are presented below:

- **RQ1.** To investigate the presence of possible differences in technological (i.e., IA, SMA, social media engagement, IGD, Phubbing, FoMO) and personological (difficulties in emotional regulation, personality traits, prosociality, and impulsivity) variables among Countries (i.e., Italy, Spain, Ecuador, and Peru).
- **RQ2.** To investigate the presence of possible relationships between IA and technological (i.e., IA, SMA, social media engagement, IGD, Phubbing, FoMO) and personological (difficulties in emotional regulation, personality traits, prosociality, and impulsivity) variables among Countries (i.e., Italy, Spain, Ecuador, and Peru).
- **RQ3.** Significant correlations between IA, SMA, and the investigated variables depending on countries.
- **RQ4.** The investigated variables will be predictors of IA in all the four countries.

Varchetta, M., Tagliaferri, G., Mari, E., Quaglieri, A., Cricenti, C., & Martí-Vilar, M. (2024). Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables: A Comparative Study in Italy, Spain, Ecuador, and Peru. *Journal of Clinical Medicine*, *13*(12), 3451. https://doi.org/10.3390/jcm13123451

Methods

1. Doctoral Thesis Schedule

Table 1 provides a summary of all the work carried out throughout the Doctoral Thesis.

Table 1. Doctoral Thesis Schedule

Course	Nov. Dec. Jan.	Feb. Mar. Apr. May.	Jun. Jul. Aug. Sep. Oct.
1st year **2020/2021**	Systematic review of the scientific literature and study design.	Search for references in specific information databases and initial questionnaire screening.	Data Analysis from the first Italian sample
2nd year **2021/2022**	Scientific publication: From Emotional (Dys)Regulation to Internet Addiction: A Mediation Model of Problematic Social Media Use Among Italian Young Adults. Journal of Clinical Medicine: Q2 JCR.	Second round of questionnaire screening. Data Analysis of the Second Spanish sample Draft of the article: "Gender differences in internet addiction: A study on variables related to its possible development".	Draft of the article: "Psychosocial risk factors of Technological Addictions in a sample of Spanish University Students: the influence of Emotional (Dys)Regulation, Personality traits and FoMO on Internet Addiction" to be sent to scientific journals.
3rd year **2022/2023**	Data Analysis from the first Ecuadorian and Peruvian sample Scientific publication: "Gender differences in internet addiction: A study on variables related to its possible development". Computers in Human Behavior Reports: Q1 JCR.	Scientific publication: "Psychosocial risk factors of Technological Addictions in a sample of Spanish University Students: the influence of Emotional (Dys)Regulation, Personality traits and FoMO on Internet Addiction". Psychiatry Research: Q1 JCR.	Draft of the article: "Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables: A Comparative Study in Italy, Spain, Ecuador, and Peru".
4th year **2023/2024**	Draft of the article: "Exploring Gender differences in Internet Addiction and Psychological Factors: A Study in a Spanish Sample". Draft of the Thesis by compendium.	Scientific publication: "Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables: A Comparative Study in Italy, Spain, Ecuador, and Peru". Journal of Clinical medicine: Q2 JCR" Draft of the Thesis by compendium.	Scientific publication: "Exploring Gender differences in Internet Addiction and Psychological Factors: A Study in a Spanish Sample". Brain Sciences: Q2 JCR. Draft of the Thesis by compendium.

During the four years of my PhD program, research activities were meticulously planned and executed, ensuring a structured and progressive development of the thesis. In the first year (2020/2021), the focus was on laying the groundwork for the project. Between November and January, a systematic review of the scientific literature was conducted, followed by the design of the study. From February to May, references were collected from specific databases, and a preliminary selection of research tools was conducted. From June to October, data collection and analysis for the first Italian sample were carried out, providing a solid empirical basis for the subsequent phases of the research.

Starting in 2021, a co-supervision agreement with the University of Rome "La Sapienza" significantly expanded the scope of the research, allowing for an enriched study context with new data and a deeper understanding of the phenomenon under investigation. In the second year (2021/2022), the project made significant progress with the publication of the article "From Emotional (Dys)Regulation to Internet Addiction: A Mediation Model of Problematic Social Media Use Among Italian Young Adults" in the Journal of Clinical Medicine (Q1 JCR). This international, peer-reviewed, open-access journal is renowned for publishing innovative theoretical and empirical research across all aspects of medicine and health research, including chronic disease management and mental health. The study clarified the mechanisms through which emotional dysregulation can lead to problematic social media use, highlighting significant implications for prevention and clinical intervention.

Between February and March 2022, a second round of questionnaire screening was conducted, followed by the collection and analysis of data from the second Spanish sample. During April and May, a draft of the article "Gender Differences in Internet Addiction: A Study on Variables Related to Its Possible Development" based on an Italian sample was prepared, highlighting gender differences in IA and identifying key variables related to its development. From June to October, a draft of the article "Psychosocial Risk Factors of Technological Addictions in a Sample of Spanish University Students: The Influence of Emotional (Dys)Regulation, Personality Traits, and FoMO on Internet Addiction" was prepared, replicating and deepening the findings of the first study on a Spanish sample, confirming the importance of psychosocial factors in the emergence of technological addictions.

In 2022, the research further expanded internationally by including participants from South America, specifically from Ecuador and Peru, with the aim of extending the findings to different cultural contexts. This expansion allowed for an exploration of how the studied variables manifest in different cultural environments, enriching the research with a valuable comparative dimension and contributing to a more global understanding of the phenomenon. In the third year (2022/2023), from November to January, data analysis for the first Ecuadorian and Peruvian samples was conducted.

During the same period, the article "Gender Differences in Internet Addiction: A Study on Variables Related to Its Possible Development" was published in Computers in Human Behavior Reports (Q1 JCR), an international, peer-reviewed, open-access journal dedicated to the study of human behavior in relation to technology, covering issues ranging from psychology to sociology and providing a forum for innovative research in the field.

From February to May, the research "Psychosocial Risk Factors of Technological Addictions in a Sample of Spanish University Students: The Influence of Emotional (Dys)Regulation, Personality Traits, and FoMO on Internet Addiction" was completed and published in Psychiatry Research (Q1 JCR), an international, peer-reviewed journal that focuses on publishing empirical and theoretical research in psychiatry, with a particular emphasis on psychopathology, treatment, and prevention of mental disorders. The study provided crucial insights into the interactions between psychological variables and technological addictions in a university context, offering suggestions for preventive and therapeutic interventions.

From June to October, the draft of the article "Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables: A Comparative Study in Italy, Spain, Ecuador, and Peru" was completed. This work highlighted cultural differences in the manifestations and causes of IA, further enriching the literature with comparative data of international relevance.

In October 2023, due to unforeseen circumstances, an extension of one year was requested to complete the remaining activities between Italy and Spain, ensuring the thorough conclusion of this extensive research project.

In the fourth and final year (2023/2024), the focus was on finalizing the research results and preparing the thesis. From November to January, a draft of the article "Exploring Gender Differences in Internet Addiction and Psychological Factors: A Study in a Spanish Sample" was prepared, along with the initial draft of the thesis by compendium. From February to May, the cross-cultural study was published in the Journal of Clinical Medicine (Q1 JCR), consolidating the findings and laying the groundwork for future research. The period from June to October was dedicated to the publication of the study on gender differences, which has been accepted and is pending publication in Brain Sciences Journal, and the finalization of the thesis by compendium, thus completing a rich and complex research journey that has significantly contributed to the understanding of technological addictions and their associated variables.

2. Materials

All studies were conducted through international collaboration between the Universitat de Valéncia and Sapienza University of Rome (Italy). They were developed in alignment with the objectives of the research group on prosociality, GIUV2023-563 GISProsoc (https://www.uv.es/sinergia-prosocial-gisprosoc/ca/grup-investigacio-sinergia-prosocial-gisprosoc.html), research line in Addictive behaviour and prosocial behaviour, of which I am a member, alongside another co-author from the Department of Psychology at Sapienza University.

Below is the most important information about the studies comprising this compendium thesis:

1. First Study: "From Emotional (Dys)Regulation to Internet Addiction/ A Mediation Model of Problematic Social Media Use among Italian Young Adults".

   This study primarily focused on examining the relationships between IA, problematic social media use (such as FoMO and SMA), emotional dysregulation, and personality traits in a sample of 397 Italian participants aged 18–35 years. The objective was to provide a more comprehensive and integrated model for understanding IA, exploring predictors and risk factors that might contribute to its onset and development. The Pearson correlation analysis revealed significant associations between IA and the other investigated variables, such as FoMO, SMA, emotional dysregulation, and specific personality traits (e.g., neuroticism). The mediation model highlighted the key role of emotional dysregulation in the relationship between FoMO and problematic social media use. The results support the development of a new integrated model to understand IA, offering new insights into the predictors and risk factors.

   My contributions to the research involved writing the theoretical section, conceptualizing the study, and supervising the data analysis and interpretation. I also participated in the writing, review, and editing of the final draft, ensuring that the conclusions were presented clearly in line with the study's objectives.

   The article was published in the *Journal of Clinical Medicine*, a well-regarded journal indexed in major databases like the Science Citation Index Expanded (SCIE). The journal boasts a current impact factor of 3.9, placing it in the second quartile (Q2) in the Medicine, General & Internal category, ranking it among the top 82.2% of journals in this field. Furthermore, the journal is indexed in Scopus, placing in the first quartile (Q1) in the General Medicine category with an impact factor of 5.4. and in SCIMAGO JOURNAL & COUNTRY RANK (SJR), first quartile (Q1) in the Medicine, Medicine Miscellaneous category. Being fully open

access, it promotes greater visibility and accessibility of its articles. Additionally, the journal is indexed in multiple prestigious databases, including Scopus and Web of Science, which further broadens its global reach. The journal's high citation numbers reflect the wide interest and influence of its publications.

Since its publication in December 2021, the article has already demonstrated significant impact, receiving 28 citations in Web of Science, ten citations in PMC, and 34 citations across Scopus and Dimensions. On Google Scholar, the article has amassed a total of 54 citations, further highlighting its broad recognition and influence within the academic community. The article is available in the institutional repository RODERIC of the Universitat de Valéncia, accessible via the following link: https://hdl.handle.net/10550/83549, and also in the repository IRIS of Sapienza University of Rome, accessible here: https://iris.uniroma1.it/handle/11573/1601500.

2. Second Study: “Psychosocial risk factors of Technological Addictions in a sample of Spanish University Students the influence of Emotional (Dys)Regulation, Personality traits and FoMO on Internet Addiction”.

   The findings of the second study build upon previous research, allowing us to pursue new investigations and involve new PhD students in this field. Based on the results of the first study, the objective of the current research was to investigate the relationships between IA, SMA, and certain psychological variables that may influence the onset of these disorders (FoMO, emotional dysregulation, personality traits), using a sample of Spanish university students. The study’s findings enabled the development of a new model, accounting for different risk and protective indicators. This model facilitates the creation of prevention programs for addictive Internet behaviors in young people.

   Among the most relevant results, the correlation analysis showed a positive relationship between FoMO, SMA, IA, emotional dysregulation, and the neuroticism dimension of the Big Five personality traits. Furthermore, a negative relationship was observed between IA, SMA, conscientiousness, and gender. The mediation model tested demonstrated that the total effect of emotional (dys)rehulation on the IA score was significant, as was its indirect effect through BSMAS and FoMO scores, which was both positive and significant.

   My contributions to the development of this work involved writing the theoretical section, designing the data analyses, and supervising the interpretation of results. I also contributed to

drafting the conclusions and the final revision of the article, ensuring that the results were clearly and coherently presented in relation to the study's objectives.

Regarding quality indices, the article was published in the journal *Psychiatry Research*, a leading journal in Psychiatry, published by Elsevier since 1979. The journal is indexed in the Social Sciences Citation Index (SSCI) in the PSYCHIATRY – SSCI category and the Science Citation Index Expanded (SCIE) in the PSYCHIATRY – SCIE category, being ranked Q1 in both databases, specifically in the first decile of journals included in both categories. The article was published in November 2023, using the 2022 JCR indicators.

The journal is also indexed in Scopus with a Q1 ranking in Medicine: Psychiatry and Mental Health category and Neuroscience: Biological psychiatry. Furthermore, the journal holds a Q1 ranking in the Medicine - Psychiatry and Mental Health category and in the Neuroscience - Biological Psychiatry category in the SCIMAGO JOURNAL & COUNTRY RANK (SJR), along with other databases such as Academic Search Premier (EBSCO), PASCAL, MEDLINE (United States National Library of Medicine), and Psycinfo (American Psychological Association - APA), among others. Regarding the article's impact, since its publication in October 2023, it has already received five citations in Web of Science, four citations in PMC, as well as six citations in Scopus and Dimensions. On Google Scholar, it has received eight citations. The article is available in the institutional repository RODERIC of the Universitat de Valéncia, accessible via the following link: https://roderic.uv.es/handle/10550/90730 and also in the repository IRIS of Sapienza University of Rome, accessible here: https://iris.uniroma1.it/handle/11573/1692477

3. Third Study: "Gender differences in internet addiction/ A study on variables related to its possible development".

   The primary objective of this third study was to explore gender differences in the development of IA and related behaviors, such as IGD, SMA, FoMO, and Phubbing. The study specifically aimed to investigate whether these behaviors could be explained by psychological variables like impulsivity, prosocial behavior, and emotional regulation. The hypotheses predicted that men and women would show significant differences in IA-related variables, with distinct psychological traits acting as predictors for each gender. The study is particularly notable for focusing on an Italian sample, consisting of 276 participants aged 18–30 years, with 46.7% male representation.

   The results demonstrated that gender is a key factor in the development of IA. While both males and females shared SMA as the primary predictor of IA, exclusive predictors were

identified for each gender. Women were found to have higher levels of IA, FoMO, and SMA, while men were more prone to IGD and Phubbing. Furthermore, females displayed higher levels of prosociality, whereas males exhibited greater emotional dysregulation and impulsivity.

My contribution to this work included writing the theoretical section, conceptualizing the study, and assisting in the software used for analysis. I also supervised the interpretation of the results, participated in the writing, review, and editing process, and ensured the clear presentation of conclusions in alignment with the study's objectives.

The article was published in *Computers in Human Behavior Reports*, a reputable journal indexed in major databases like Scopus and Web of Science. The journal has a current impact factor of 4.9 as of 2023, with a five-year impact factor of 5.2. It is indexed in Scopus and holds a Q1 ranking in key fields such as Neuroscience and Psychology and in SCIMAGO JOURNAL & COUNTRY RANK (SJR), first quartile (Q1) in the Neuroscience/Psychology and Computer Science. The journal, published by Elsevier, specializes in studies related to human-computer interactions and the psychological aspects of technology use. It also boasts a h-index of 15 in 2023, highlighting its influence in the academic community.

Since its publication in December 2022, the article has garnered substantial attention, with citations numbering 20 in Web of Science and 20 in Scopus and Dimensions. On Google Scholar, it has received 39 citations, indicating significant academic interest in the study. The article is available in the institutional repository RODERIC of the Universitat de Valéncia, accessible via the following link: https://hdl.handle.net/10550/84941, and also in the IRIS repository of Sapienza University of Rome, accessible via this link: https://iris.uniroma1.it/handle/11573/1666892.

4. Fourth Study: "Exploring Gender differences in Internet Addiction and Psychological Factors A Study in a Spanish Sample".

   Building upon the prior study conducted, which explored gender differences in IA within an Italian sample, this fourth research extends the inquiry to a Spanish sample. The aim is to investigate gender-specific patterns of IA and related behaviors (e.g., SMA, IGD, Phubbing), along with psychological variables like impulsivity, emotional regulation, and prosociality. This study focuses on identifying gender differences in Internet-related behaviors, with males expected to score higher in IA and IGD, and females in SMA and phone obsession dimension of Phubbing. It also analyzes correlations between IA and the examined variables, varying by

gender, and explores gender-specific predictors of IA. The study, conducted with 585 participants (265 males, 320 females), revealed that males exhibited higher levels of IA and IGD, while females showed higher levels of SMA and smartphone dependency. Emotional regulation and social media engagement emerged as significant predictors of IA in females, whereas gaming behaviors were more relevant in males. These findings highlight the importance of considering gender as a critical variable in the research on Internet.

My contribution to the development of the work involved writing the theoretical section, conceptualization of the study, formal analysis, software resources, and supervision of the interpretation of results. I also contributed to drafting the final version of the article, ensuring clarity and coherence.

The article was published in Brain Sciences, a reputable journal indexed in key databases such as the Science Citation Index Expanded (SCIE). It holds an impact factor of 3.4 (2023), placing it in the second quartile (Q2) in the Neurosciences category. Additionally, the journal is indexed in Scopus, where it also ranks in Q2 with a CiteScore of 4.4. In the SCIMAGO Journal & Country Rank (SJR), it is classified in Q2 within the Neurology and Clinical Neurology fields. Since its publication in October 2024, citation data is still pending.

The article will be available in the institutional repository RODERIC of the Universitat de Valéncia, with the following link: https://hdl.handle.net/10550/101440.

5. Fifth Study: "Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables A Comparative Study in Italy, Spain, Ecuador, and Peru".

   This study investigates cultural differences in PUI and its associated psychological variables across four countries: Italy, Spain, Ecuador, and Peru. The aim is to identify significant differences in technological variables, including IA, SMA, IGD, Phubbing, and FoMO, alongside personological variables such as emotional regulation difficulties, personality traits, prosociality, and impulsivity within these countries. Additionally, it seeks to explore the relationships between IA and various technological and personological variables in the context of cultural differences.

   The study involved 675 participants aged 18 to 54 and revealed significant cultural variations. Italian participants exhibited higher levels of IA, but lower levels of SMA compared to participants from other countries. Moreover, FoMO was found to be more prevalent among the Italian sample, while the level of IGD was lower compared to Peru. In terms of Phubbing, Italians reported significantly higher scores than those from Peru. Regression analyses

indicated that different predictors of PUI emerged depending on the cultural context, highlighting the importance of these factors in understanding PUI.

My contributions to the study included conceptualizing the research, writing the final version, conducting formal analyses, managing the investigation, and overseeing project administration. The article was published in the *Journal of Clinical Medicine*, a well-regarded journal indexed in major databases like the Science Citation Index Expanded (SCIE). The journal boasts a current impact factor of 3.9, placing it in the second quartile (Q2) in the Medicine, General & Internal category, ranking it among the top 82.2% of journals in this field. Furthermore, the journal is indexed in Scopus, placing in the first quartile (Q1) in the General Medicine category with an impact factor of 5.4. and in SCIMAGO JOURNAL & COUNTRY RANK (SJR), first quartile (Q1) in the Medicine, Medicine Miscellaneous category. Being fully open-access, it promotes greater visibility and accessibility of its articles. Additionally, the journal is indexed in multiple prestigious databases, including Scopus and Web of Science, which further broadens its global reach. The journal's high citation numbers reflect the wide interest and influence of its publications (SCI Journal) (SciMago).

Since its publication in June 2024, the article has garnered notable attention, receiving one citation in Scopus and one citation on Google Scholar, indicating early interest in the findings. The article is available in the institutional repository RODERIC of the Universitat de Valéncia, accessible via the following link: https://hdl.handle.net/10550/100192.

Table 2 includes all the information on the five articles included in this compendium on publication-related information.

Table 2. Summary of the articles included in the compendium

Journal and Index	Author and year	Work title and doi	Article status
Journal of Clinical Medicine **JCR** – Q2 (Medicine, General & Internal); **CiteScore** – Q1 (Medicine: General Medicine); **SJR –** Q1 (Medicine, Medicine Miscellaneous)	Quaglieri et al. (2022).	From emotional (Dys) regulation to internet addiction: A mediation model of problematic social media use among Italian young adults. https://doi.org/10.3390/jcm11010188	Published
Psychiatry research **JCR** – Q1 (Psychiatry): **CiteScore** - Q1 (Medicine, Psychiatry and Mental Health / Neuroscience Biological Psychiatry); **SJR** – Q1 (Medicine-Psychiatry and Mental Health; Neuroscience-Biological Psychiatry)	Varchetta et al. (2023).	Psychosocial risk factors of technological addictions in a sample of Spanish University students: the influence of emotional (dys) regulation, personality traits and fear of missing out on internet addiction. https://doi.org/10.1016/j.psychres.2023.115518	Published
Computers in Human Behavior Reports **JCR** – Q1 (Psychology, Experimental / Psychology, Multidisciplinary) **CiteScore** – Q1 (Neuroscience / Psychology; Computer Science); **SJR** – Q1 ((Neuroscience / Psychology; Computer Science)	Mari et al. (2023).	Gender differences in internet addiction: A study on variables related to its possible development. https://doi.org/10.1016/j.chbr.2022.100247	Published
Brain Sciences	Varchetta et al (2024).	Exploring Gender differences in Internet Addiction and Psychological Factors: A Study in a Spanish Sample.	Published

JCR – Q2 (Neuroscience); **CiteScore** – Q2 (Neuroscience) **SJR – Q2** (Neurology and Clincal Neurology)		https://doi.org/10.3390/brainsci14101037	
Journal of Clinical Medicine **JCR** – Q2 (Medicine, General & Internal); **CiteScore** – Q1 (Medicine: General Medicine); **SJR –** Q1 (Medicine, Medicine Miscellaneous)	Varchetta et al. (2024).	Cross-Cultural Examination of Problematic Internet Use and Associated Psychological Variables: A Comparative Study in Italy, Spain, Ecuador, and Peru. https://doi.org/10.3390/jcm13123451	Published

3. Procedure, instruments and data analysis

The following section outlines the procedures and instruments used to conduct the research project. Additionally, it details the data analysis methods, participant characteristics, and specific instruments utilized in each of the studies included in this doctoral dissertation

Participants were recruited online across multiple studies and responded voluntarily and anonymously to the surveys, which were accessed through a designated link on the Qualtrics Online Platform. In each study, participants provided informed consent before beginning the survey and were free to stop or exit at any point without providing an explanation. The surveys were distributed using a non-probabilistic convenience sampling method, targeting specific demographics such as legal-age Spanish-speaking or Italian-speaking university students. The surveys were accessible across various environments (e.g., home, university, work) and devices (e.g., PCs, smartphones, tablets) in four countries: Italy, Spain, Ecuador, and Peru. Ethical approval was obtained from the respective Institutional Review Boards (IRB 2193/2020 from the Department of Psychology, Faculty of Medicine and Psychology, "Sapienza" University of Rome, and IRB 15910/2021 from the Comité de Ética, Universitat de Valéncia), with all procedures adhering to the principles of the Declaration of Helsinki. Data collection occurred between January 2021 and December 2022.

Below is a description of the instruments used for data collection in the research.

Internet Addiction Test (IAT) - The Internet Addiction Test (IAT), developed by Young (1998), is a widely used instrument for measuring addictive Internet use. It consists of 20 items based on the DSM-IV criteria, it assesses aspects such as the fear of living without the Internet and attempts to reduce time spent online. Responses are recorded on a five-point Likert scale ranging from 1 (very rarely) to 5 (very frequently). Scores are categorized as follows (Jelenchick et al., 2012): normal users or problem-free users (< 40 points), and problematic Internet users (≥ 40 points). Both the Italian version of the IAT (Fioravanti & Casale, 2015) and the Spanish version by Fernández-Villa et al. (2015) were used.

Social Media Engagement Scale (SMES) - The Social Media Engagement Scale (SMES), developed by Przybylski and colleagues (2013), assesses the frequency of social network use during daily activities. Participants rate their engagement on an eight-point Likert-type scale ranging from 1 (No day last week) to 8 (Every day last week).

Bergen Social Media Addiction Scale (BSMAS) - The Bergen Social Media Addiction Scale (BSMAS, Andreassen et al., 2016), is based on Griffiths' (2005) structural factor (i.e., six dimensions)

scale, and consists of six items assessing aspects like salience, mood, modification, tolerance, withdrawal conflict, and relapse (e.g., "How often during the last year have you used social media so much that it has negatively impacted your job/studies?" "How often during the last year have you felt an urge to use social media more and more?"). Responses are recorded on a 5-point Likert scale. A total score of 24 or higher indicates a possible clinical diagnosis of SMA. (Luo et al., 2021). The Spanish version, developed by Vallejos-Flores et al., (2018), and the Italian version, developed by Monacis et al., (2017), were used.

Internet Gaming Disorder Scale - Short Form (IGDS9-SF) - The Internet Gaming Disorder Scale-Short Form (IGDS9-SF), developed by Pontes and Griffiths (2015), assesses the severity of IGD and its negative effects by examining both online and/or offline gaming activities (i.e., over 12 months). The scale consists of nine items, each of which corresponds to one of the nine core criteria defined by the DSM-5 (APA, 2013). Participants rate their responses on a five-point Likert scale ranging from 1 (never) to 5 (very often). Higher scores indicate a higher degree of IGD. Both the Italian version, developed by Monacis et al., (2016), and the Spanish version, validated by Beranuy et al., (2020), were used.

Fear of Missing Out Scale (FoMOs) - The Fear of Missing Out Scale (FoMOs), developed by Przybylski et al., (2013), is a 10-item self-report questionnaire designed to measure individuals' experiences of a pervasive apprehension that others are engaged in rewarding activities and positive relationships in their absence (e.g., "I get worried when I find out my friends are having fun without me"). Respondents rate their agreement on a 5-point Likert scale ranging from 1 (not true of me) to 5 (extremely true of me). Higher average scores on the FoMOs scale, which range from 1 to 5, signify higher levels of FoMO. The questionnaire is composed of two factors: the first relates to the fear that others are having more rewarding experiences or are having fun without the subject, and the second relates to the need to control what is going on in one's own social relationships.
Both the Spanish version, developed by Gil et al., (2015), and the Italian version, developed by Casale and Fioravanti (2020), were used.

Phubbing Scale (PHUB) - The Phubbing Scale (PHUB), developed by Karadag et al., (2015), consists of ten items designed to measure Phubbing behavior on a five-point Likert scale ranging from 1 (never) to 5 (always). The scale assesses two factors: "Communication disturbances" (e.g., "My eyes start wandering on my phone when I'm together with others") and "Phone obsession" (e.g., "When I wake up in the morning, I first check the messages on my phone"). Both the Italian version,

developed by Guazzini et al., (2019), and the Spanish version, validated by Blanca & Bendayan (2018), were used.

Difficulties in Emotion Regulation Scale (DERS) - The Difficulties in Emotion Regulation Scale (DERS), developed by Gratz and Roemer (2004), is a self-report questionnaire consisting of 36 items that assess six dimensions of difficulties in emotion regulation. These dimensions include non-acceptance, goal-directed behavior, impulse control, limited access to effective emotional regulation strategies, lack of emotional awareness, and lack of emotional clarity. In this study, the Italian short version, proposed by Lausi et al., (2020), was used. This version consists of 20 items, and participants rated their responses on a five-point Likert scale ranging from 1 (almost never) to 5 (almost always). Higher scores indicate greater difficulties in emotion regulation. Additionally, for the Spanish-speaker samples we utilized the Chilean short version of the DERS proposed by Guzman Gonzalez et al., (2014). This version consists of 25 items and provides a global score, calculated as the average of all item scores, as well as scores for each scale representing different dimensions of emotional regulation. Participants responded on a 5-point Likert scale.

Big Five Inventory-10 (BFI-10) - The Big Five Inventory-10 (Rammstedt & John, 2007) is a self-report questionnaire that evaluates five personality dimensions (i.e., Extroversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience). Items (e.g., "I see myself as a person that is reserved", "I see myself as a person that tends to find fault with others") are rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The present study applied the Italian version of the scale, developed by Guido et al. (2015). The reliability of each personality dimension was tested using Spearman–Brown coefficients, indicating: 0.69 for Extroversion, 0.39 for Agreeableness, 0.69 for Conscientiousness, 0.42 for Neuroticism, and 0.71 for Openness to Experience.

Big Five Inventory (BFI-15) - The Big Five Inventory-15 (Gerlitz and Schupp, 2005) was used in this study. This inventory was designed to assess five personality dimensions: Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Participants rate their responses on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Item examples were: "I see myself as a person that is reserved" and "I see myself as a person that tends to find fault with others". The adaptation of the scale for the Spanish-speaking context was carried out by Dominguez-Lara and Merino-Soto (2018).

Prosociality Scale (PS) - The Prosociality Scale (PS) developed by Caprara et al., (2005) is a 16-item questionnaire that assesses different behaviors and feelings associated with four types of

prosocial actions: sharing, helping, taking care of, and feeling empathic towards others and their needs. Participants responded to each prosocial behavior item on a five-point Likert scale, ranging from 1 (never/almost never true) to 5 (almost always/always true).
In the case of the Spanish-speaking sample, an adapted version of the scale was used, as developed by Rodriguez et al., (2017). This adaptation ensures linguistic and cultural appropriateness for the Spanish-speaking participants, enhancing the validity and reliability of the instrument within this specific cultural and linguistic context.

Impulsive Behavior Scale (UPPS-P) - The Impulsive Behavior Scale, developed by Billeux et al. (2012) consists of 20 items and evaluates five dimensions of impulsivity (i.e., positive urgency, negative urgency, lack of perseverance, lack of premeditation, and sensation seeking). Participants responded on a four-point Likert scale, ranging from 1 (strongly agree) to 4 (strongly disagree). Both the Italian version of the UPPS-P (D'Orta et al., 2015) and the Spanish version by Candido et al. (2012) were used in this study.

The following paragraphs will provide a detailed description of the participants, the instruments used, and the data analyses conducted for each of the five studies included in this compendium.

3.1. Study 1

3.1.1. Participants

For this first study, the sample was comprised of 397 Italian young adults (123 males, 274 females). Ages ranged from 18 to 35 years, with an average age of 22.00 years (SD = 3.83). With respect to education, 1.8% had a primary or middle school diploma, 73.6% had a high school diploma, 16.6% had a bachelor's degree, 7.1% had a master's degree, and 1.0% had a postgraduate degree. Regarding occupation, a vast majority of participants were students (80.9%), 0.3% worked in law enforcement, 2.3% were conceptual employees, 1.3% were executive employees, 1.0% were managers, 0.8% were teachers, 1.5% were workers, 2.5% were practitioners, 1.8% were healthcare professionals, and 7.8% were "other".

3.1.2. Instruments

Below in Table 3, the specific scales used in the study are detailed, along with data related to Cronbach's alpha.

Table 3. Instruments (Study 1)

Instruments	Author and year	Italian version	Cronbach's Alpha
Internet Addiction Test (IAT)	Young (1998)	Fioravanti and Casale (2015)	**Total score:** 0.85
Bergen Social Media Addiction Scale (BSMAS)	Andreassen et al. (2016)	Monacis et al. (2017)	**Total score:** 0.78
Fear of Missing Out Scale (FoMOs)	Przybylski et al. (2013)	Casale and Fioravanti (2020)	**Total score:** 0.83
Difficulties in Emotion Regulation Scale (DERS)	Gratz & Roemer (2004)	Lausi et al. (2020)	**Total score:** 0.88 **Non acceptance:** 0.89 **Goal Directed Behavior:** 0.91 **Impulse control:** 0.91 **Lack of emotional clarity:** 0.86 **Lack of emotional awareness:** 0.82
Big Five Inventory-10 (BFI-10)	Rammstedt & John (2007)	Guido et al. (2015).	**Extraversion:** 0.69 **Agreeableness:** 0.39 **Cosciuntiousness;** 0.69 **Neuroticism:** 0.42 **Openness to Experience:** 0.71

3.1.3. Data Analysis

Pearson's correlation coefficients (*r*) were calculated to study the associations between scores on the IAT, BSMAS, FoMOs, DERS, and BFI-10 Neuroticism and Conscientiousness subscales. The mediation model was run using PROCESS version 3.5, as developed by Preacher and Hayes for SPSS, version 26 (IBM, Armonk, NY). PROCESS estimates indirect effects (i.e., mediation) and conditional indirect effects (i.e., moderated mediation) using bootstrap confidence intervals. In the present study, the bias-corrected 95% confidence interval (CI) was calculated using 5000 bootstrapping resamples. Effects were considered significant when the resulting confidence interval did not contain 0. A serial mediation model (Model 6) was tested using PROCESS Model Templates, in order to explore whether the association between difficulties in emotional regulation (i.e., DERS) and IA (i.e., IAT) were mediated by SMA (i.e., BSMAS) and FoMO (i.e., FoMOs), using BFI-10 Neuroticism and Conscientiousness subscale scores as covariates.

3.2. Study 2

3.2.1. Participants

A total of 763 participants were involved in the study 2. Of the total 763 participants, 3 of them did not provide their consent and 171 did not complete the entire questionnaire. Therefore, the final sample was composed of 589 Spanish University students (118 male, 471 female) aged from 18 to 35 years (M = 21.56; SD = 2.73). This study adopted the Monte Carlo Power Analysis for Indirect Effects to determine the adequate sample size for the serial mediation which the simulation web app calculated (Schoemann et al., 2017) as 207 responses (β = 0.80). All the socio-demographic characteristics of the participants are shown in Table 4.

Table 4. Descriptive statistics (Study 2)

Age	Mean	21.56
	Std. Deviation	2.73
	Range	18-35
		N (%)
Gender	Male	118 (20.0)
	Female	471 (80.0)
Educational Level	Primary/middle School	3 (0.5)
	High School	474 (80.5)
	Bachelor's degree	87 (14.8)
	Master's degree	24 (4.1)
	Postgraduate degree	1 (0.1)
University studies	Psychology	435 (73.9)
	Other faculties	58 (26.1)
Marital Status	Single	305 (51.8)
	Non-cohabiting partner	247 (41.9)
	Cohabiting partner	35 (5.9)
	Married	2 (0.4)
Cohabitation	Alone	20 (3.4)
	Partner	36 (6.1)
	Partner with children	2 (0.4)
	Relatives	353 (59.9)
	Flatmates	178 (30.2)

3.2.2. Instruments

In Table 5 below, the questionnaires employed in the study are outlined, along with the corresponding Cronbach's alpha data.

Table 5. Instruments (Study 2)

Instruments	Author and year	Spanish version	Cronbach's Alpha
Internet Addiction Test (IAT)	Young (1998)	Fernández-Villa et al. (2015)	**Total score:** 0.85
Bergen Social Media Addiction Scale (BSMAS)	Andreassen et al. (2016)	Vallejos-Flores et al. (2018)	**Total score:** 0.82
Fear of Missing Out Scale (FoMOs)	Przybylski et al. (2013)	Gil et al. (2015)	**Total score:** 0.82
Difficulties in Emotion Regulation Scale (DERS)	Gratz & Roemer (2004)	Guzmán-González et al. (2014)	**Total score:** 0.89 **Non acceptance:** 0.92 **Goal directed behavior:** 0.89 **Impulse control:** 0.91 **Lack of emotional clarity:** 0.85 **Lack of emotional awareness:** 0.86
Big Five Inventory-15 (BFI-15)	Gerlitz & Schupp (2005)	Dominguez-Lara & Merino-Soto (2018a)	**Extraversion:** 0.67 **Agreeableness:** 0.68 **Conscientiousness;** 0.64 **Neuroticism:** 0.63 **Openness to Experience:** 0.59

3.2.4. Data Analysis

We calculated the Pearson's correlation coefficients (r) between scores of the IAT, BSMAS, FoMOs, DERS, and BFI-15 neuroticism and conscientiousness (sub)scales. The mediation model was run using PROCESS version 3.5, as developed by Preacher and Hayes for SPSS, version 26 (IBM, Armonk, NY). PROCESS estimates indirect effects (i.e., mediation) and conditional indirect effects (i.e., moderated mediation) using bootstrap confidence intervals. In the present study, the bias-corrected 95% confidence interval (CI) was calculated using 5000 bootstrapping resamples. Effects were considered significant when the resulting confidence interval did not contain 0. A serial mediation model (Model 6) was tested using PROCESS Model Templates, in order to explore whether the association between difficulties in emotional regulation (i.e., DERS) and IA (i.e., IAT) were mediated by SMA (i.e., BSMAS) and FoMO (i.e., FoMOs), using BFI-15 Neuroticism and Conscientiousness subscale scores, gender, marital status and cohabitation as covariates.

3.3. Study 3

3.3.1. Participants

A total of 276 participants were recruited for the study 3; 46.7% were males, and their ages ranged from 18 to 30 years (M = 22.25, SD = 3.31). A total of 68.8% of the participants had secondary education, 18.1% had an undergraduate degree, 9.8% had a graduate degree, 2.2% only had a primary education, and 1.1% had a master's or doctoral degree. Of the respondents, 79% were students, 82.2% lived with their families, and 51.1% had a partner. The full sociodemographic characteristics are described in Table 4. The sample was divided into two groups based on gender. The male Group comprised 129 participants, with a mean age of 22.76 (SD = 3.65), while the female Group comprised 147 participants, with a mean age of 21.81 (SD = 2.93). Statistically significant differences were found between the two groups in age (F (1,275) = 5.74, p = 0.017).

Table 6. Descriptive statistics (Study 3).

		N	%
Gender	Male	129	46.7%
	Female	147	53.3%
Education	Primary education	6	2.2%
	Secondary education	190	68.8%
	Undergraduate degree	50	18.1%
	Graduate degree	27	9.8%
	Master or Doctoral degree	3	1.1%
Marital Status	Single	122	44.2%
	Married	1	0.4%
	Cohabitant	12	4.3%
	In a relationship	141	51.1%
Occupation	Businessman	4	1.4%
	Practitioner	9	3.3%
	Managerial employer	3	1.1%
	Conceptual employer	4	1.4%
	Worker	5	1.8%
	Professional Healthcare	6	2.2%
	Teacher	3	1.1%
	Student	218	79.0%
	Other	24	8.7%
Family type (lives with)	On my own	15	5.4%
	Partner	11	4.0%
	Partner and child/children	2	0.7%
	Relatives	227	82.2%
	Cohabitant/s	21	7.6%

3.3.2. Instruments

Table 7 provides an overview of the questionnaires used in the study, along with their associated Cronbach's alpha values.

Table 7. Instruments (Study 3)

Instruments	Author and year	Italian version	Cronbach's Alpha
Internet Addiction Test (IAT)	Young (1998)	Fioravanti and Casale (2015)	**Total score:** 0.85
Bergen Social Media Addiction Scale (BSMAS)	Andreassen et al. (2016)	Monacis et al. (2017)	**Total score:** 0.77
Internet gaming Disorder Scale – Short Form (IGDS9-SF)	Pontes & Griffiths (2015)	Monacis et al. (2016)	**Total score:** 0.85
Phubbing Scale (PHUB)	Karadag et al. (2015)	Guazzini et al. (2019)	**Total score:** 0.83
Fear of Missing Out Scale (FoMOs)	Przybylski et al. (2013)	Casale and Fioravanti (2020)	**Total score:** 0.83
Prosociality Scale (PS)	Caprara et al. (2015)	Caprara et al. (2015)	**Total score:** 0.92
Impulsive Behavior Scale (UPPS-P)	Whiteside & Lynam (2001)	D'Orta et al. (2015)	**Negative Urgency:** 0.83 **Positive Urgency:** 0.78 **Lack of premeditation:** 0.82 **Lack of perseverance:** 0.92 **Sensation seeking:** 0.82
Difficulties in Emotion Regulation Scale (DERS)	Gratz & Roemer (2004)	Lausi et al. (2020)	**Total score:** 0.90 **Non acceptance:** 0.91 **Goal Directed Behavior:** 0.90 **Impulse control:** 0.91 **Lack of emotional clarity:** 0.87 **Lack of emotional awareness:** 0.82

3.3.3. Data Analysis

Statistical analyses were performed using the Statistical Package for Social Science (SPSS; version 26.0; IBM SPSS, Armonk, NY). Descriptive statistics are provided for gender, age, education, marital status, profession, and family type (see Table 1). Questionnaire scores were analyzed by using an independent-samples t-test and finally results were controlled for age (MANCOVA) by using the Bonferroni correction.

When Levene's test for equality of variances was significant, we reported the corrected degree of freedom rounded to the nearest whole number (as implemented in SPSS). For each gender separately, we conducted Partial Pearson's correlations and subsequently stepwise linear regression analyses to explore relationships between variables and IA. The variance inflation factor (VIF) and tolerance were used to verify the multicollinearity problem. Statistical significance was defined at $p < 0.05$. The distributions of all data were verified for normality, and all statistical analyses were performed on deidentified data.

3.4. Study 4

3.4.1. Participants

The study included a total of 585 participants, with 265 males and 320 females, aged between 18 and 35 years (M = 22.11, SD = 3.08). In terms of educational attainment, 73.3% of participants held a bachelor's degree, 19.7% had completed undergraduate studies, 6.5% had earned a master's or doctoral degree, and 0.5% had only primary education. A majority of respondents (85%) were students, with 55.7% identifying as single and 44.3% in a relationship.

Males represented 45.3% of the sample (M = 22.76, SD = 3.65), while females constituted 54.7% (M = 21.81, SD = 2.93), remaining within the acceptable 40%-60% range to reduce potential gender bias. A detailed breakdown of the sociodemographic data is provided in Table 8

Table 8. Descriptive statistics (Study 4).

		N (%)
Age	Mean	22.11
	Std. Deviation	3.08
	Range	18-35
Gender	Male	265 (45.3)
	Female	320 (54.7)
Marital status	Single	326 (55.7)
	Married	2 (0.3)
	Cohabitant	43 (7.4)
	In a relationship	214 (36.6)
	Separated	-
	Widowed	-
Educational Level	Secondary School	3 (0.5)
	High School	19.7 (19.7)
	Bachelor's degree	429 (73.3)
	Master's degree	37 (6.3)
	Postgraduate degree	1 (0.2)
Working Condition	Businessman	5 (0.9)
	Practioner	13 (2.2)
	Managerial employer	6 (1)
	Conceptual employer	5 (0.9)
	Manual worker	2 (0.3)
	Worked in agriculture	3 (0.5)
	Law enforcement officers	5 (0.9)
	Professional Healthcare	8 (1.4)
	Teacher	10 (1.7)
	Student	497 (85.0)
	Other	31 (5.3)

3.4.2. Instruments

The questionnaires utilized in the study are presented in Table 9 below, along with their respective Cronbach's alpha values.

Table 9. Instruments (Study 4)

Instruments	Author and year	Spanish version	Cronbach's Alpha
Internet Addiction Test (IAT)	Young (1998)	Fernández-Villa et al. (2015)	**Total score:** 0.86
Social Media Engagement Scale (SMES)	Przybylski et al. (2013)	Przybylski et al. (2013)	**Total score:** 0.79
Bergen Social Media Addiction Scale (BSMAS)	Andreassen et al. (2016)	Vallejos-Flores et al. (2018)	**Total score:** 0.87
Internet gaming Disorder Scale – Short Form (IGDS9-SF)	Pontes & Griffiths (2015)	Beranuy et al. (2020)	**Total score:** 0.72
Phubbing Scale (PHUB)	Karadag et al. (2015)	Blanca & Bendayan (2018)	**Communication disturbances:** 0.87 **Phone obsession:** 0.86
Fear of Missing Out Scale (FoMOs)	Przybylski et al. (2013)	Gil et al. (2015)	**Total score:** 0.80
Prosociality Scale (PS)	Caprara et al. (2015)	Rodriguez et al. (2017)	**Total score:** 0.61
Impulsive Behavior Scale (UPPS-P)	Whiteside & Lynam (2001)	Candido et al. (2012)	**Total score:** 0.90 **Negative Urgency:** 0.84 **Positive Urgency:** 0.79 **Lack of premeditation:** 0.81 **Lack of perseverance:** 0.90 **Sensation seeking:** 0.83
Difficulties in Emotion Regulation Scale (DERS)	Gratz & Roemer (2004)	Guzmán-González et al. (2014)	**Total score:** 0.83 **Non acceptance:** 0.91 **Goal directed behavior:** 0.89 **Impulse control:** 0.91 **Lack of emotional clarity:** 0.87 **Lack of emotional awareness:** 0.86
Big Five Inventory-15 (BFI-15)	Gerlitz & Schupp (2005)	Dominguez-Lara & Merino-Soto (2018a)	**Total score:** 0.93 **Extraversion:** 0.87 **Agreeableness:** 0.88 **Conscientiousness:** 0.84 **Neuroticism:** 0.83 **Openness to Experience:** 0.89

3.4.3. Data Analysis

The study used IBM SPSS Statistics (version 26.0; Armonk, NY, USA) to perform all statistical analyses. Descriptive statistics were calculated for demographic factors including gender, age, educational level, marital status, occupation, and family structure, with results provided for key metrics like mean, median, and standard deviation.

To compare scores from questionnaires across groups, a Multivariate Analysis of Variance (MANOVA) was conducted. The dependent variables included measures of problematic Internet use, emotion, and self-reported personality traits, while gender served as the fixed factor. Bonferroni corrections were applied to adjust for multiple gender-based comparisons, with a significance threshold set at $p < 0.05$.

Effect sizes were reported using eta squared (η^2), and the values were interpreted according to Cohen's (1998) criteria, where η^2 values of 0.01, 0.06, and 0.14 signify small, medium, and large effects, respectively. Assumptions for parametric tests were assessed through variance ratio tests and Levene's tests for homogeneity of variances. Separate partial Pearson's correlations were conducted for each gender, with Fisher's z test used to compare the significance of correlation coefficients between the two gender groups.

Stepwise linear regression analyses were also carried out to explore the relationships between variables and IA, with multicollinearity assessed via variance inflation factors (VIF) and tolerance values. A significance level of $p < 0.05$ was applied throughout, and data normality was checked before running analyses. All analyses were performed on anonymized data following ethical guidelines.

3.5. Study 5

3.5.1. Participants

The sample of the study 5 was composed of 675 participants (251 male, 424 female). Ages ranged from 18 to 54 years, (M = 22.73, SD = 4.05). We recruited the participants in four different countries, Italy, Spain, Ecuador, Perú.

Italian sample: 186 participants (86 males and 100 females) with an age range from 18 and 30 (M= 22.15, SD = 3.29). In this sample, 66.7% of the participants had secondary education, 19.4% had a graduate degree, and 9.7% had a master's or doctoral degree and 2.7% only had a primary education. Of the respondents, 80.6% were students, 80.6% lived with their families, and 52.7% had a partner.

Spanish sample: A total of 164 participants (62 male and 102 females). Their ages ranged from 18 and 30 (M= 21.63, SD = 2.40). As regards the level of education, 76.8% of the participants had secondary education, 17.1% had a graduate degree, 5.5% had a master's or doctoral degree and 0.6% only had a primary education, Furthermore, 83.5% were students, 57.9% lived with their families, and 39.6% had a partner.

Ecuador sample: 171 participants were included (57 males and 114 females). The age ranges from 18 and 54 (M= 22.42, SD = 5.74). As regards the level of education, 73.7% of the participants had secondary education, 20.5% had a graduate degree, 1.2% had a master's or doctoral degree and 0.6% only had a primary education. Of the respondents, 78.9% were students, 84.8% lived with their families, and 20.5% had a partner.

Peru sample: 154 participants from Peru (46 males and 108 females) with an age ranged from 18 and 46 (M= 24.74, SD = 4.75). As regards the level of education, 25.3% of the participants had secondary education, 31.8% had a graduate degree, 3.9% had a master's or doctoral degree and 39% had a primary education. Concerning other sociodemographic characteristics, 75.3% were students, 84.4% lived with their families, and 21.4% had a partner.

Table 10: Descriptive statistics (Study 5).

		Italy	Spain	Ecuador	Peru
Age	Mean	22.15	21.63	22.42	24.74
	DS	3.29	2.40	5.74	4.75
	Range	18-30	18-30	18-54	18-46
		N (%)			
Gender	Male	86 (46.2)	62 (37.8)	57 (33.3)	46 (29.9)
	Female	100 (53.8)	102 (62.2)	114 (66.7)	108 (70.1)
Marital status	Single	79 (42.5)	88 (53.7)	117 (68.4)	108 (70.1)
	Married	-	-	15 (8.8)	8 (5.2)
	Cohabitant	9 (4.8)	11 (6.7)	3 (1.8)	3 (1.9)
	Relationship	98 (52.7)	65 (39.6)	35 (20.5)	33 (21.4)
	Separated	-	-	1 (0.6)	1 (0.6)
	Widowed	-	-	-	1 (0.6)
Educational Level	Secondary School	5 (2.7)	1 (0.6)	1 (0.6)	60 (39.0)
	High School	124 (66.7)	126 (76.8)	126 (73.7)	39 (25.3)
	Bachelor's degree	36 (19.4)	28 (17.1)	35 (20.5)	49 (31.8)
	Master's degree	18 (9.7)	9 (5.5)	7 (4.1)	6 (3.9)
	Postgraduate degree	3 (1.6)	-	2 (1.2)	-
Cohabitation	Living alone	11 (5.9)	3 (1.8)	6 (3.5)	14 (9.1)
	Partner	8 (4.3)	11 (6.7)	9 (5.3)	3 (1.9)
	Partner/Children	1 (0.5)	-	10 (5.8)	5 (3.2)
	Relatives	150 (80.6)	95 (57.9)	145 (84.8)	2 (1.3)
	Cohabiting	16 (8.6)	55 (33.5)	1 (0.6)	130 (84.4)
Working Condition	Businessman	4 (2.2)	-	2 (1.2)	3 (1.9)
	Practioner	6 (3.2)	5 (3.0)	16 (9.4)	12 (7.8)
	Manager	3 (1.6)	-	2 (1.2)	-
	Employer	1 (0.5)	-	1 (0.6)	3 (1.9)
	Manual worker	3 (1.6)	-	1 (0.6)	1 (0.6)
	Farmer	-	1 (0.6)	1 (0.6)	1 (0.6)
	Police officers	-	1 (0.6)	-	-
	Healthcare	6 (3.2)	2 (1.2)	7 (4.1)	2 (1.3)
	Teacher	2 (1.1)	5 (3.0)	3 (1.8)	10 (6.5)
	Student	150 (80.6)	137 (83.5)	135 (78.9)	116 (75.3)
	Other	11 (5.9)	13 (7.9)	3 (1.8)	6 (3.9)

3.5.2. Instruments

Table 11 details the scales used in the study, along with their Cronbach's alpha coefficients.

Table 11. Instruments (Study 5)

Instruments	*Author and year*	*Italian version*	*Spanish version*	*Cronbach's Alpha*
Internet Addiction Test (IAT)	Young (1998)	Fioravanti and Casale (2015)	Fernández-Villa et al. (2015)	**Total score:** 0.85 – 0.90
Social Media Engagement Scale (SMES)	Przybylski et al. (2013)	Przybylski et al. (2013)	Przybylski et al. (2013)	**Total score:** 0.70 - 0.84
Bergen Social Media Addiction Scale (BSMAS)	Andreassen et al. (2016)	Monacis et al. (2017)	Vallejos-Flores et al. (2018)	**Total score:** 0.77 - 0.82
Internet gaming Disorder Scale – Short Form (IGDS9-SF)	Pontes & Griffiths (2015)	Monacis et al. (2016)	Beranuy et al. (2020)	**Total score:** 0.85 – 0.93
Phubbing Scale (PHUB)	Karadag et al. (2015)	Guazzini et al. (2019)	Blanca & Bendayan (2018)	**Communication disturbances:** 0.57 -0.80 **Phone obsession:** 0.63 – 0.76
Fear of Missing Out Scale (FoMOs)	Przybylski et al. (2013)	Casale and Fioravanti (2020)	Gil et al. (2015)	**Total score:** 0.81 - 0.83
Prosociality Scale (PS)	Caprara et al. (2015)	Caprara et al. (2015)	Rodriguez et al. (2017)	**Total score:** 0.90 - 0.92
Big Five Inventory-10 (BFI-10)	Rammstedt & John (2007)	Guido et al. (2015).	-	**Extraversion:** 0.73 **Agreeableness:** 0.59 **Conscientiousness;** 0.75 **Neuroticism:** 0.58 **Openness to Experience:** 0.74
Big Five Inventory-15 (BFI-15)	Gerlitz & Schupp (2005)	-	Dominguez-Lara & Merino-Soto (2018a)	**Extraversion:** 0.64 – 0.81 **Agreeableness:** 0.67 – 0.79 **Conscientiousness:** 0.60 – 0.67 **Neuroticism:** 0.65 – 0.68 **Openness to Experience:** 0.53 – 0.63
Impulsive Behavior Scale (UPPS-P)	Whiteside & Lynam (2001)	D'Orta et al. (2015)	Candido et al. (2012)	**Total score:** 0.85 – 0.90 **Negative Urgency:** 0.75 – 0.83 **Positive Urgency:** 0.56 – 0.78 **Lack of premeditation:** 0.67 - 0.82 **Lack of perseverance:** 0.73 – 0.93 **Sensation seeking:** 0.79 – 0.86
Difficulties in Emotion Regulation Scale (DERS)	Gratz & Roemer (2004)	Lausi et al. (2020)	Guzmán-González et al. (2014)	**Total score:** 0.88 – 0.92

3.5.4. Data Analysis

The statistical analyses for this study were conducted using the Statistical Package for Social Science (SPSS; version 26.0; IBM SPSS, Armonk, NY). Comprehensive descriptive statistics were provided for demographic variables, including age, gender, marital status, level of education, cohabitation status, and working conditions, which are reported in Table 6.

Following the descriptive phase, questionnaire scores were analyzed by using a Multivariate Analysis of Variance (MANOVA) with (i.e., problematic-Internet use, emotion and personality self-reported measures) as dependent variables and the four countries as fixed factors. We conducted multiple comparisons using the Bonferroni correction for different dependent variables across the four countries (Italy, Spain, Ecuador, and Peru). The parametric assumptions of the equality of variance of scores between groups were checked using variance ratio tests and Levene's tests.

Subsequently, for each country separately, partial Pearson's correlations were conducted, followed by stepwise linear regression analyses to investigate possible relationships between variables and IA. Multicollinearity was assessed using the Variance Inflation Factor (VIF) and tolerance. Statistical significance was established at $p < 0.05$. To ensure the robustness of the findings, the distributions of all data were verified for normality, and all statistical analyses were performed on de-identified data in line with ethical standards.

Results

1. Study 1

Table 12 presents the descriptive statistics for the main study measures.

Table 12 Descriptive statistics for the IAT, BSMAS, FoMOs, DERS, and BFI-10 Neuroticism and Conscientiousness scores (Study 1).

	M (SD) N = 397
IAT	43.47 (9.40)
BSMAS	2.01 (0.67)
FoMO	25.08 (6.48)
DERS	51.74 (12.13)
BFI (N)	10.23 (2.65)
BFI (C)	12.03 (2.45)

Note. IAT: Internet Addiction Test; BSMAS: Bergen Social Media Addiction Scale; FoMO: Fear of Missing Out; DERS: Difficulties in Emotion Regulation Scale; BFI (N): BFI (N) Big Five Inventory–10 (neuroticism); BFI (C) = Big Five Inventory–10 (coscientiusness).

In this first study, our Pearson's correlation analysis (see Table 13), revealed some intriguing patterns. The IAT score had a significant positive correlation with all the variables measured: BSMAS, FoMO, DERS, and BFI "neuroticism" scores. Interestingly, it showed a negative correlation with the BFI "conscientiousness" score. Furthermore, the IAT score had a strong positive relationship with the BSMAS score, a weak negative relationship with the BFI "conscientiousness" score, and moderate positive relationships with FoMOs, DERS, and BFI "neuroticism" scores.

Additionally, our analysis demonstrate that the BFI "conscientiousness" score had a weak negative correlation with all the other variables. In contrast, there were moderate positive correlations among the remaining variables: BSMAS, FoMO, DERS, and BFI "neuroticism" scores. These findings highlight the complex interplay between these factors in our study.

Table 13. Correlation coefficients (Pearson's r) between the IAT, BSMAS, FoMOs, DERS, and BFI-10 neuroticism and conscientiousness scores (Study 1).

	IAT	BSMAS	FoMOs	DERS	BFI (N)	BFI (C)
IAT	-	.786**	.526**	.444**	.396**	-.250**
BSMAS	.786**	-	.492**	.380**	.371**	-.146**
FoMO	.526**	.492**	-	.447**	.407**	-.152**
DERS	.444**	.380**	.447**	-	.495**	-.273**
BFI (N)	.396**	.371**	.407**	.495**	-	-.174**
BFI (C)	-.250**	-.146**	-.152**	-.273**	-.174**	-

Note. ** $p < 0.01$; IAT = Internet Addiction Test; BSMAS = Bergen Social Media Addiction Scale; FoMO = Fear of Missing Out; DERS = Difficulties in Emotion Regulation Scale; BFI (N) = Big Five Inventory-10 (neuroticism); BFI (C) = Big Five Inventory-10 (coscientiusness).

Following this, we explored the hypothesized relationships among emotional regulation difficulties (e.g. DERS), IA (e.g. IAT), SMA (e.g. BSMAS), and FoMO. Our analysis revealed a significant total effect of the DERS score on the IAT score (B = 0.230, *SE*(HC0) = 0.04, p < 0.001, CI = 0.1522, 0.3071). As detailed in Table 14, there was also a significant and positive indirect effect of the DERS score on the IAT score through the BSMAS and FoMO scores (*B* = 0.161), with the bootstrapped 95% confidence interval excluding zero [0.0990, 0.2250].

In our final model, the BFI neuroticism and conscientiousness scores were included as covariates. neuroticism was found to have a significant positive association with the IAT score (*B* = 0.807), while conscientiousness showed a significant negative association (*B* = -0.496), as illustrated in Figure 1. This mediation model explained 25% of the variance in IAT, highlighting the interplay between these psychological factors.

Table 14. Model coefficients for the serial mediation analysis (Study 1).

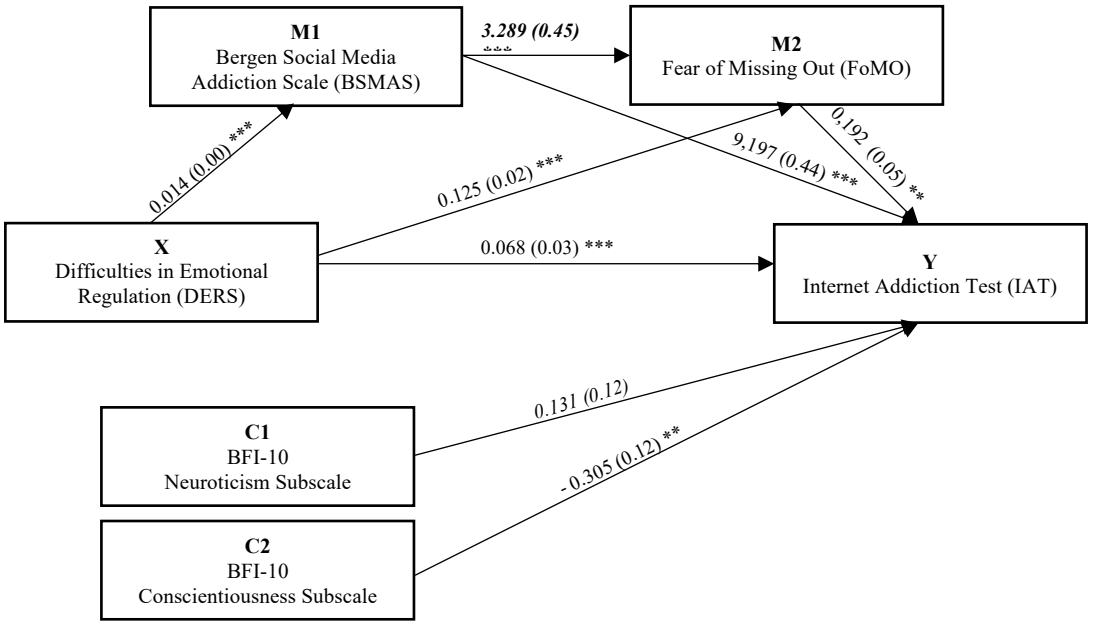
	BSMAS		FoMO		IAT	
Predictor	β (SE HC0)	p	β (SE HC0)	p	β (SE HC0)	p
Independent variable						
DERS	0.014 (.00)	<0.001	0.125 (0.02)	<0.001	0.068 (.03)	0.014
BSMAS	-	-	-	-	9.197 (.44)	<0.001
FoMOs	-	-	-	-	0.192 (.05)	<0.001
Covariate						
BFI (N)	0.061 (.01)	<0.001	0.397 (0.12)	<0.001	0.131 (0.12)	0.272
BFI (C)	-.010 (.01)	0.455	-0.025 (0.12)	0.828	-0.395 (0.12)	0.002
R^2	0.19		0.34		0.67	
F HC0 (df)	34.309 (3,393) ***		51.207 (4,392) ***		176.752 (5,391) ***	

Total effect on IAT	IAT		95% CI	
	β (SE)	p	LL	UL
DERS	0.227 (.039)	<0.001	0.1522	0.3071
BFI (N)	0.807 (.169)	<0.001	0.4752	1.1379
BFI (C)	-0.496 (0.172)	0.004	-0.8352	-0.1568
R^2	0.25			
F HC0 (df)	52.043 (3,393) ***			

Bootstrap indirect effects on IAT	IAT	95% CI	
	β (SE)	LL	UL
Total	0.161 (0.03)	0.0990	0.2250
BMSAS	0.128 (0.03)	0.0721	0.1858
FoMO	0.024 (0.01)	0.0095	0.0431
BMSAS, FoMOs	0.009 (0.00)	0.0033	0.0166

Note. DERS = Difficulties in Emotion Regulation; BSMAS = Bergen Social Media Addiction Scale; FoMO = Fear of Missing Out; IAT = Internet Addiction Test; BFI (N) = Big Five Inventory-10 (neuroticism); BFI (C) = Big Five Inventory-10 (coscientiusness). Bootstrap sample size = 5,000 (two-tailed); *p* < .001***.

Figure 1. Mediation model (Study 1).



Note. Numbers represent standard coefficients and numbers within parenthesis represent standardized errors.
X = independent variable; Y=dependent variable; M1 = mediator 1; M2 = mediator 2; C1 = Covariate 1; C2 = Covariate 2; ** = $p < 0.01$; *** = $p < 0.001$.

2. Study 2

Table 15 showcases the descriptive statistics, including mean scores, standard deviation, and median scores for all the variables in the second study. Pearson's correlation analysis in Table 16 highlighted that the IAT score was significantly and positively linked to all considered variables like BSMAS, FoMO, DERS, and BFI "neuroticism", while it was negatively correlated with BFI "conscientiousness". Specifically, there was a strong positive correlation between the IAT and BSMAS scores; a moderate positive correlation with FoMO, DERS, and BFI "neuroticism"; and a weak negative correlation with BFI "conscientiousness". Similar patterns were observed for BSMAS and FoMO. Generally, all the variables were positively correlated with each other, whereas BFI "conscientiousness" had a weak negative correlation with the others.

Table 15. Descriptive statistics for the IAT, DERS, BFI-15 neuroticism and conscientiousness, FoMO, and BSMAS measures (Study 2).

	M (SD) n = 589	Median n = 589
IAT	35.65 (9.09)	34.00
DERS	69.68 (13.76)	69.00
DERS (NA)	16.70 (6.72)	15.00
DERS (I)	13.29 (3.71)	13.00
DERS (G)	13.20 (5.35)	12.00
DERS (AW)	19.42 (3.64)	20.00
DERS (C)	7.06 (2.57)	7.00
BFI (N)	2.77 (0.95)	2.67
BFI (C)	4.10 (0.73)	4.33
BFI (O)	3.59 (0.85)	3.67
BFI (E)	3.75 (0.90)	4.00
BFI (A)	4.29 (0.65)	4.33
FoMO	2.31 (0.68)	2.20
BSMAS	2.34 (0.75)	2.33

Note. IAT = Internet Addiction Test; DERS = Difficulties in Emotion Regulation Scale; DERS (NA) = Difficulties in Emotion Regulation Scale (Non acceptance); DERS (I) = Difficulties in Emotion Regulation Scale (Impulse); DERS (G) = Difficulties in Emotion Regulation Scale (Goals); DERS (AW) = Difficulties in Emotion Regulation Scale (Awareness); DERS (C) = Difficulties in Emotion Regulation Scale (Clarity); BFI (N) = Big Five Inventory-15 (neuroticism); BFI (C) = Big Five Inventory-15 (conscientiousness); BFI (O) = Big Five Inventory-15 (openness to experience); BFI (E) = Big Five Inventory-15 (extraversion); BFI (A) = Big Five Inventory-15 (agreeableness); FoMO = Fear of Missing Out; BSMAS = Bergen Social Media Addiction Scale.

Table 16. Correlation coefficients (Pearson's r) between the IAT, DERS, BFI-15 neuroticism and conscientiousness, FoMO, and BSMAS scores (Study 2).

	IAT	DERS	BFI (N)	BFI (C)	FoMO	BSMAS
IAT	-	0.387 **	0.275 **	- 0.164 **	0.451 **	0.719 **
DERS	0.387 **	-	0.573 **	- 0.133 **	0.432 **	0.417 **
BFI (N)	0.275 **	0.573 **	-	- 0.141 **	0.244 **	0.225 **
BFI (C)	- 0.164 **	- 0.133 **	- 0.141 **	-	- 0.041	- 0.111
FoMO	0.451 **	0.432 **	0.244 **	- 0.041	-	0.475 **
BSMAS	0.719 **	0.417 **	0.225 **	- 0.111	0.475 **	-

Note. ** $p < 0.001$; IAT = Internet Addiction Test; DERS = Difficulties in Emotion Regulation Scale; BFI (N) = Big Five Inventory-15 (neuroticism); BFI (C) = Big Five Inventory-15 (conscientiousness); FoMO = Fear of Missing Out; BSMAS = Bergen Social Media Addiction Scale.

We also examined the prediction regarding the connection between IA (IAT), SMA (BSMAS), and FoMO. Interestingly, the direct effect of the DERS score on the IAT score wasn't significant (B = 0.020, SE(HCO) = 0.02, p = 0.413), yet the total effect of the DERS score on the IAT score was significant (ß = 0.227, SE(HC0) = 0.03, $p < 0.001$, CI = 0.1640, 0.2902). Furthermore, the total indirect effect of the DERS score on the IAT score through BSMAS and FoMO was positive and significant (ß = 0.207), with the bootstrapped 95% CI excluding 0 [0.1580, 0.2575] as shown in Table 17. In the final model, five covariates displayed varied effects: BFI "neuroticism" and gender were significantly linked to the IAT score, positively and negatively respectively (ß = 0.911; ß = -2.773), while BFI "conscientiousness", marital status, and cohabitation didn't show significant associations with the IAT score (ß = -0.681; ß = -0.199; ß = -0.299). See Figure 2. Ultimately, the final mediation model explained 18% of the variance in IAT.

Table 17. Model coefficients for the serial mediation analysis (Study 2).

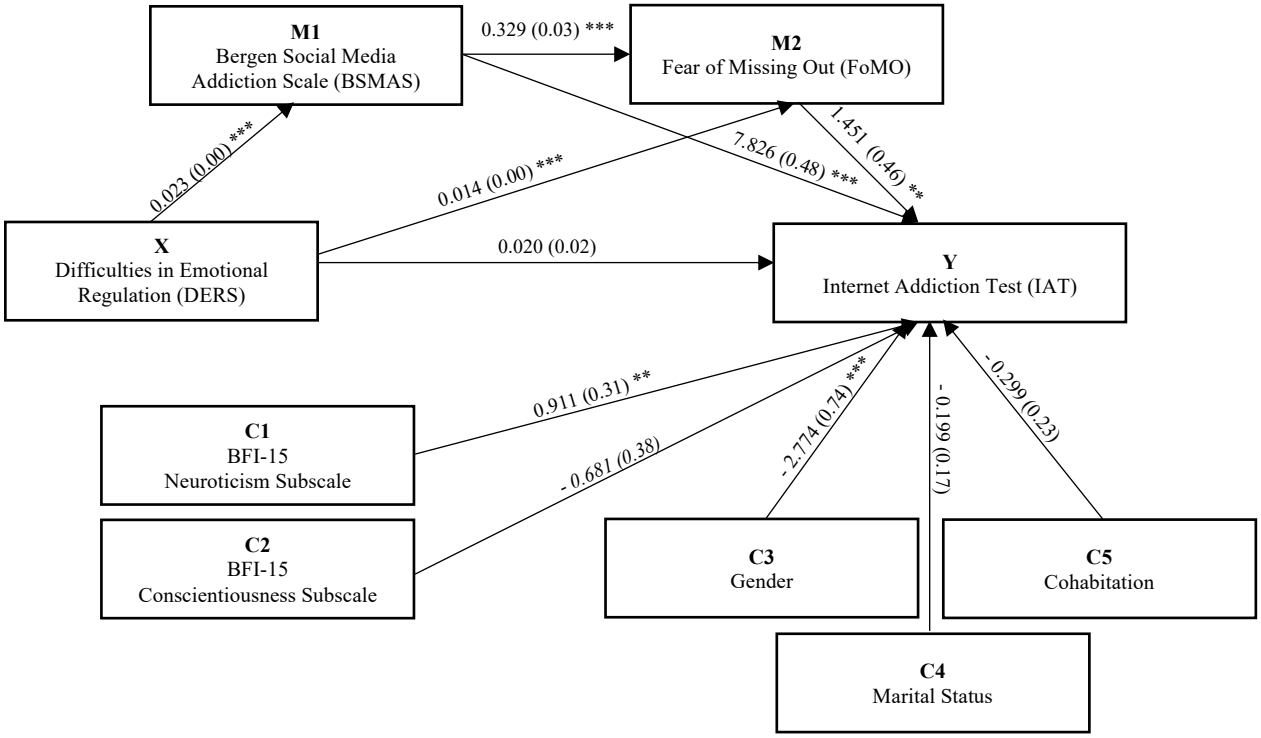
Predictor	BSMAS		FoMO		IAT	
	ß (SE HC0)	p	ß (SE HC0)	p	ß (SE HC0)	p
Independent variable						
DERS	0.023 (0.00)	< 0.001	0.014 (0.00)	< 0.001	0.020 (0.02)	0.413
BSMAS	-	-	0.329 (0.03)	< 0.001	7.826 (0.48)	< 0.001
FoMO	-	-	-	-	1.450 (0.46)	< 0.01
Covariate						
BFI (N)	- 0.025 (0.04)	0.486	0.008 (0.03)	0.800	0.911 (0.31)	< 0.01
BFI (C)	- 0.069 (0.04)	0.078	0.046 (0.03)	0.170	- 0.681 (0.38)	0.076
Gender	0.234 (0.08)	< 0.01	- 0.127 (0.06)	< 0.05	- 2.773 (0.74)	< 0.001
Marital Status	-0.060 (0.02)	< 0.01	- 0.017 (0.01)	0.303	- 0.199 (0.17)	0.239
Cohabitation	0.007 (0.03)	0.780	0.006 (0.02)	0.736	- 0.299 (0.23)	0.195
R^2	0.20		0.30		0.57	
F HCO (df)	26.112 (6,582) ***		35.664 (7,581) ***		72.508 (8,580) ***	

Total effect on IAT	IAT		95% CI	
	ß (SE)	p	LL	UL
DERS	0.227 (0.03)	< 0.001	0.1640	0.2902
BFI (N)	0.715 (0.40)	0.076	- 0.0759	1.5059
BFI (C)	- 1.183 (0.50)	< 0.05	- 2.1668	- 0.2009
Gender	- 1.019 (0.97)	0.296	- 2.9312	0.8928
Marital Status	- 0.722 (0.23)	< 0.01	- 1.1721	- 0.2724
Cohabitation	- 0.229 (0.30)	0.448	- 0.8223	0.3639
R^2	0.18			
F HCO (df)	21.330 (6,582) ***			

Bootstrap indirect effects on IAT	IAT	95% CI	
	ß (SE)	LL	UL
Total	0.313 (0.04)	0.2438	0.3830
BSMAS	0.175 (0.02)	0.1285	0.2234
FoMO	0.021 (0.01)	0.0076	0.0363
BSMAS, FoMO	0.011 (0.00)	0.0038	0.0193

Note. DERS = Difficulties in Emotion Regulation; BSMAS = Bergen Social Media Addiction Scale; FoMO = Fear of Missing Out; IAT = Internet Addiction Test. BFI (N) = Big Five Inventory-15 (neuroticism); BFI (C) = Big Five Inventory-15 (coscientiusness). Bootstrap sample size = 5000 (two-tailed); p < 0.001 ***.

Figure 2. Mediation Model (Study 2)



Note. Numbers represent standard coefficients and numbers within parenthesis represent standardized errors. X = independent variable; Y=dependent variable; M1 = mediator 1; M2 = mediator 2; C1 = Covariate 1; C2 = Covariate 2; C3 = Covariate 3; C4 = Covariate 4; C5 = Covariate 5. ** = $p < 0.01$; *** = $p < 0.001$.

3. Study 3

3.1. Differences between the male and the female groups.

In our analysis of the IAT, we examined the total score and its two dimensions: "Emotional and cognitive preoccupations with the Internet and social consequences" and "Loss of control and interference with daily duties".

While no significant differences between groups were found, controlling for age revealed that females scored higher on the "Loss of control" dimension [$F_{(2)} = 4.213$, $p < 0.05$; $\eta^2 = 0.030$].

The BSMAS showed significant gender differences both [$t(274) = -2.53$, $p < 0.05$, $d = 0.30$] and after controlling for age ($p < 0.05$; $\eta^2 = 0.005$), with females scoring higher ($M = 2.10$, $SD = 0.71$) than males ($M = 1.89$, $SD = 0.67$). For the IGDS9-SF, males scored significantly higher ($M = 15.63$, $SD = 5.69$) compared to females ($M = 11.81$, $SD = 3.59$) [$t(274) = 5.85$, $p < 0.001$, $d = 0.80$], a result that remained significant after controlling for age ($p < 0.001$; $\eta^2 = 0.142$).

Regarding the Phubbing, females scored higher on the "phone obsession" dimension [$t(274) = -2.27$, $p < 0.05$, $d = 0.27$], a finding that held after controlling for age ($p < 0.05$; $\eta^2 = 0.025$) with means of $M = 15.60$ ($SD = 3.18$) for females and $M = 14.72$ ($SD = 3.23$) for males. For FoMO, the "Need to control" dimension showed significant gender differences [$t(274) = -2.43$, $p < .05$, $d = 0.29$], also significant after controlling for age ($p < 0.01$; $\eta^2 = 0.045$), with females scoring higher ($M = 16.18$, $SD = 4.09$) compared to males ($M = 14.98$, $SD = 4.08$). The total FoMO score was also significantly higher for females [$F_{(2)} = 5.280$, $p < 0.01$, $\eta 2 = 0.037$], with means of $M = 25.71$ ($SD = 6.69$) for females and $M = 24.28$ ($SD = 6.96$) for males.

Among the dimensions of the DERS, only "awareness" showed significant gender differences [$t(249) = 3.36$, $p < 0.01$, $d = 0.40$], even after controlling for age ($p < 0.01$; $\eta^2 = 0.046$), with Levene's test indicating unequal variances ($F = 6.35$, $p = 0.012$). Additionally, the "goals" and "clarity" dimensions showed significant differences after controlling for age [$F_{(2)} = 9.49$, $p < 0.001$, $\eta^2 = 0.065$; $F_{(2)} = 4.897$, $p < 0.01$, $\eta^2 = 0.035$], with females scoring higher on "goals" ($M = 14.07$, $SD = 3.88$) and males higher on "clarity" ($M = 8.77$, $SD = 3.14$).

The Prosociality Scale revealed significant gender differences [$t(274) = -5.07$, $p < 0.001$, $d = 0.60$], maintained after controlling for age ($p < 0.001$; $\eta_2 = 0.088$), with females scoring higher ($M = 4.11$, $SD = .63$) than males ($M = 3.73$, $SD = 0.62$). Lastly, the "lack of perseverance" and "sensation seeking" dimensions of the UPPS also showed significant gender differences [$t(274) = 3.20$, $p < 0.01$, $d = 0.38$ and $t(271) = 2.89$, $p < 0.01$, $d = 0.36$, respectively], persisting after controlling for age ($p < 0.001$; $\eta^2 = 0.057$; $p < 0.05$; $\eta^2 = 0.030$). Males scored higher on "lack of perseverance" ($M = 10.37$, $SD = 4.05$) and "sensation seeking" ($M = 12.93$, $SD = 3.12$) than females ($M = 8.87$, $SD = 3.75$ and $M = 11.70$, $SD = 3.95$, respectively). See Table 18 for greater clarity.

Table 18. Differences between the male and the female groups (Study 3).

Independent-samples t test						
Variables	**t**	**df**	***p***	**d**	**Male M(SD)**	**Female M(SD)**
IAT (E)	0.725	274	0.469	-	20.50(6.48)	19.98(5.54)
IAT (L)	-1.05	274	0.294	-	23.91(5.28)	24.56(4.97)
IAT	-0.103	274	0.918	-	44.42(10.79)	44.54(9.41)
BSMAS	-2.53	274	**0.05***	0.30	1.89(0.67)	2.10(0.71)
IGD	5.85	171	**0.001*****	0.80	15.63(5.68)	11.81(3.59)
PHUB (CD)	-0.567	274	0.571	-	11.85(2.97)	12.05(2.74)
PHUB (OBS)	-2.27	274	**0.05***	0.27	14.72(3.23)	15.60(3.18)
FoMO (F)	-0.526	274	0.600	-	9.30(3.65)	9.53(3.55)
FoMO (C)	-2.43	274	**0.05***	0.29	14.98(4.08)	16.18(4.09)
FoMO	-1.74	274	0.084	-	24.28(6.96)	25.71(6.69)
DERS (NA)	0.279	274	0.781	-	12.72(5.13)	12.54(5.36)
DERS (G)	-0.091	274	0.928	-	14.03(4.11)	14.07(3.88)
DERS (I)	0.106	274	0.916	-	10.00(4.26)	9.95(4.24)
DERS (C)	0.888	274	0.375	-	8.77(3.14)	8.45(2.82)
DERS (AW)	3.36	249	**0.01****	0.40	8.33(3.49)	7.03(2.89)
DERS	1.15	274	0.249	-	53.85(13.29)	52.04(12.75)
PS	-5.07	274	**0.001*****	0.60	3.73(0.62)	4.11(0.63)
UPPS (NU)	-0.585	274	0.559	-	11.54(3.72)	11.81(3.83)
UPPS (PU)	0.669	274	0.504	-	11.84(3.40)	11.56(3.35)
UPPS (LPr)	-0.738	274	0.461	-	8.40(2.92)	8.67(3.15)
UPPS (LPe)	3.20	274	**0.01****	0.38	10.37(4.05)	8.87(3.75)
UPPS (SS)	2.89	271	**0.01****	0.36	12.93(3.12)	11.70(3.95)

Note. M = Male Group; F = Female Group; IAT = Internet Addiction Test; IAT (E) = Internet Addiction Test (Emotional Interfernce; IAT (C) = Internet Addiction Test (Loss of Control) BSMAS = Bergen Social Media Addiction Scale; IGD = Internet Gaming Disorder; PB (CD) = Phubbing Scale (communication Disturbance); PB (OBS) = Phubbing Scale (phone obsession); FoMO = Fear of Missing Out; FoMO (F) = Fear of Missing Out (Fears of others' experiences); FoMO (C) = Fear of Missing Out (Need to control); DERS = Difficulties in Emotion Regulation Scale; DERS (NA) = Difficulties in Emotion Regulation Scale (non acceptance); DERS (G) = Difficulties in Emotion Regulation Scale (goals); DERS (I) = Difficulties in Emotion Regulation Scale (Impulse); DERS (C) = Difficulties in Emotion Regulation Scale (Clarity); DERS (AW) = Difficulties in Emotion Regulation Scale (awareness); PS = Prosociality Scale; UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); UPPS (SS) = Impulsivity Behavior Scale (sensation seeking).
* = difference is significant at the 0.05 level; ** = difference is significant at the 0.01 level; *** = difference is significant at the 0.001 level. The bold indicates significance.

To delve deeper into the relationships between the main variables, we calculated partial Pearson's correlations separately for males and females, controlling for age. These analyses aimed to uncover potential relationships between the total IAT score and other variables. Significant correlations for both male and female groups are detailed in Tables 19a and 19b, with Fisher's z test used for comparing significant correlation coefficients.

Table 19a. Correlations between IAT and the psychological variables in the male and female groups (Study 3).

	BSMAS	IGD	PHUB (CD)	PHUB (OBS)	FoMO (F)	FoMO (C)	FoMO
Male Group							
IAT_Total Score	**0.704*****	**0.671*****	**0.451*****	**0.497*****	**0.544*****	**0.433*****	**0.542*****
N	126	101	126	126	126	126	126
Female Group							
IAT_Total Score	**0.830*****	**0.433*****	**0.443*****	**0.583*****	**0.366*****	**0.306*****	**0.381*****
N	144	110	144	144	144	144	144
Comparing Correlations							
z	-2.536	2.496	0.081	-0.986	1.832	1.195	1.668
p	0.006	0.006	0.468	0.162	**0.033**	0.116	0.048

Note. IAT = Internet Addiction Test; IGD = Internet gaming Disorder; PB (CD) = Phubbing Scale (communication disturbance); PB (OBS) = Phubbing Scale (phone obsession); FoMO = Fear of Missing Out; FoMO (F) = Fear of Missing Out (Fears of other's experiences); FoMO (C) = Fear of Missing Out (Need to control); * = difference is significant at the 0.05 level; ** = difference is significant at the 0.01 level; *** = difference is significant at the 0.001 level. The bold indicates significance.

Table 19b. Correlations between IAT and the psychological variables in the male and female groups (Study 3).

	DERS (NA)	DERS (G)	DERS (I)	DERS (C)	DERS (AW)	UPPS (NU)	UPPS (PU)	UPPS (LPe)	PS
Male Group									
IAT_Total Score	**0.352*****	**0.391*****	**0.320*****	**0.405*****	**0.438*****	**0.254****	**0.282****	**0.289****	**0.179***
N	126	126	101	126	126	126	126	126	126
Female Group									
IAT_Total Score	**0.211***	**0.270****	**0.195***	**0.222****	**0.317*****	0.150	0.105	**0.195***	-0.005
N	144	144	110	144	144	144	144	144	144
Comparing Correlations									
z	1.244	1.103	1.087	1.652	1.146	0.88	1.495	0.81	1.507
p	0.107	0.135	0.139	**0.049**	0.126	0.189	0.067	0.209	0.066

Note. IAT = Internet addiction test; DERS (NA) = Difficulties in Emotion Regulation Scale (non acceptance); DERS (G) = Difficulties in Emotion Regulation Scale (goals); DERS (I) = Difficulties in Emotion Regulation Scale (impulse); DERS (C) = Difficulties in Emotion Regulation Scale (clarity); DERS (AW) = Difficulties in Emotion Regulation Scale (awareness); UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); PS = Prosociality Scale.

* = difference is significant at the 0.05 level; ** = difference is significant at the 0.01 level; *** = difference is significant at the 0.001 level The bold indicates significance.

For the male group, a stepwise multiple linear regression analysis showed that five predictors explained 71.4% of the variance in IA (R^2Adj = 0.714, F (5,98) = 52.33, p < 0.001). Significant predictors included BSMAS (β = 0.361, p < 0.001), IGDS9 (β = 0.426, p < 0.001), "fear that others are having more rewarding experiences" from FoMOs (β = 0.144, p < 0.05), "communication disturbances" from PHUB (β = 0.153, p < 0.05), and the "goals" dimension from DERS (β = 0.127, p < 0.05). See table 20a.

Table 20a. Multiple linear regression of IAT predictors in the Male Group (Study 3).

	b	**SE B**	**β**	***p***
(Constant)	6.626	2.899		0.024
BSMAS	5.921	1.057	0.361	< 0.001
IGDS	0.793	0.110	0.426	< 0.001
FoMO (F)	0.413	0.180	0.144	0.024
PHUB (CD)	0.536	0.203	0.153	0.010
DERS (G)	0.323	0.154	0.127	0.038

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale; FoMO (F) = Fear of Missing Out (Fear that others are having more rewarding experiences); PHUB (CD) = Phubbing Scale (communication disturbances); DERS (G) = Difficulties in Emotion Regulation Scale (goals).

For the female group, the regression analysis indicated that three predictors explained 73.7% of the variance in IA (R^2Adj = 0.737, F (3,109) = 105.53, p < 0.001). Significant predictors were BSMAS (β = 0.712, p < 0.001), "phone obsession" from Phubbing scale (β = 0.197, p < 0.01), and "lack of perseverance" from S-UPPS-P (β = 0.107, p < 0.05). See table 20b

Table 20b. Multiple linear regression of IAT predictors in the Female Group (Study 3).

	b	**SE B**	**β**	***p***
(Constant)	14.354	2.659		< 0.001
BSMAS	8.935	0.796	0.712	< 0.001
PHUB (OBS)	0.589	0.189	0.197	0.002
UPPS (LPe)	0.280	0.128	0.107	0.031

Note. BSMAS = Bergen Social Media Scale; PHUB (OBS) = Phubbing (phone obsession); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance)

4. Study 4

4.1. Descriptive statistics and mean differences between variables in the different samples

The fourth study conducted an analysis comparing mean scores between male and female groups for each variable under consideration in a Spanish sample.

Regarding the IAT, males showed statistically significant higher mean scores than females ($F_{(1,582)} = 5.15$, $p = 0.006$, $\eta^2 = 0.02$), as well as for the IGDS ($F_{(1,582)} = 30.27$, $p < 0.001$, $\eta^2 = 0.09$). Conversely, females had significantly higher levels of BSMAS than males ($F_{(1,582)} = 8.61$, $p < 0.001$, $\eta^2 = 0.03$), SMES ($F_{(1,582)} = 6.54$, $p = 0.002$, $\eta^2 = 0.02$), and the “phone obsession” dimension of Phubbing ($F_{(1,582)} = 8.91$, $p < 0.001$, $\eta^2 = 0.03$). No statistically significant differences were observed between the male and female groups regarding the “communication disturbance” dimension of Phubbing ($F_{(1,582)} = 0.47$, $p = 0.627$, $\eta^2 = 0.00$) and FoMO ($F_{(1,582)} = 0.50$, $p = 0.481$, $\eta^2 = 0.00$). All data regarding the Internet-related behaviors are shown in Table 21a.

The differences in mean scores for psychological variables are presented in Table 21b. Specifically, females exhibited higher levels of DERS than males ($F_{(1,582)} = 9.03$, $p < 0.001$, $\eta2 = 0.030$). Concerning the BFI, females showed higher levels of "neuroticism" ($F_{(1,582)} = 3.60$, $p < 0.05$, $\eta^2 = 0.01$), “agreeableness” ($F_{(1,582)} = 3.18$, $p < 0.05$, $\eta^2 = 0.01$), and “conscientiousness” ($F_{(1,582)} = 12.57$, $p < 0.001$, $\eta^2 = 0.04$). No significant differences were observed in "extraversion" ($F_{(1,582)} = 0.28$, $p = 0.756$, $\eta^2 = 0.00$) and “openness to experience” ($F_{(1,582)} = 2.54$, $p = 0.080$, $\eta^2 = 0.01$). Regarding prosocial behavior, females exhibited higher scores than males ($F_{(1,582)} = 40.89$, $p < 0.001$, $\eta^2 = 0.07$).

Finally, concerning the UPPS, females showed higher levels of "negative urgency" ($F_{(1,582)} = 6.19$, $p = 0.002$, $\eta^2 = 0.02$). Conversely, males exhibited higher levels of the "lack of perseverance" dimension ($F_{(1,582)} = 12.63$, $p < 0.001$, $\eta^2 = 0.04$), the “sensation seeking” dimension ($F_{(1,582)} = 6.48$, $p = 0.002$, $\eta^2 = 0.02$) and the “positive urgency” dimension ($F_{(1,582)} = 3.61$, $p < 0.05$, $\eta^2 = 0.01$). No statistically significant differences were observed regarding the "lack of premeditation" dimension ($F_{(1,582)} = 1.75$, $p = 0.174$, $\eta^2 = 0.01$).

Table 21a Comparison of Mean Scores and Standard Deviation of "Technological" Variables According to the Participants' Gender (Study 4).

	Groups	n	M	SD	F	P	ή2
IAT	Male	265	39.15	10.97	5.15	0.006	0.017
	Female	320	37.95	9.73			
BSMAS	Male	265	13.09	4.96	8.61	0.001	0.029
	Female	320	14.18	4.35			
SMES	Male	265	16.06	5.19	6.54	0.002	0.022
	Female	320	16.33	4.47			
IGDS	Male	188	16.75	6.13	30.27	0.001	0.089
	Female	125	12.97	4.96			
PHUB (CD)	Male	265	10.99	3.70	0.47	0.627	0.002
	Female	320	11.08	3.33			
PHUB (OBS)	Male	265	15.21	3.31	8.91	0.001	0.030
	Female	320	16.10	3.07			
FoMO	Male	265	23.58	7.04	0.50	0.481	0.001
	Female	320	23.58	7.10			

Note. ** $p < 0.001$; * $p < 0.01$; BSMAS = Bergen Social Media Addiction Scale; SMES = Social Media Engagement Scale; IGDS = Internet Gaming Disorder Scale; PHUB (CD) = Phubbing (communication disturbance); PHUB (OBS) = Phubbing (phone obsession); FoMO = Fear of Missing Out.

Table 21b Comparison of Mean Scores and Standard Deviation of Personological Variables According to the Participants' gender (Study 4).

	Groups	n	M	SD	F	P	ή2
DERS	Male	265	58.69	16.28	9.03	0.001	0.030
	Female	320	60.83	17.09			
BFI (E)	Male	265	11.06	2.85	0.28	0.756	0.001
	Female	320	11.20	2.66			
BFI (N)	Male	265	7.70	2.79	3.60	0.028	0.012
	Female	320	8.34	2.90			
BFI (A)	Male	265	12.58	2.01	3.18	0.042	0.011
	Female	320	12.99	1.92			
BFI (C)	Male	265	11.63	2.35	12.573	0.001	0.041
	Female	320	12.51	2.02			
BFI (O)	Male	265	10.95	1.62	2.54	0.080	0.009
	Female	320	10.62	1.47			
PS	Male	265	61.43	9.49	40.89	0.001	0.066
	Female	320	66.33	9.01			
UPPS (NU)	Male	265	10.43	3.79	6.19	0.002	0.021
	Female	320	11.02	4.22			
UPPS (PU)	Male	265	11.65	3.41	3.61	0.028	0.012
	Female	320	11.65	3.26			
UPPS (LPr)	Male	265	8.83	3.03	1.75	0.174	0.006
	Female	320	8.41	2.87			
UPPS (LPe)	Male	265	8.80	3.20	12.63	0.001	0.042
	Female	320	7.56	2.94			
UPPS (SS)	Male	265	12.71	3.76	6.48	0.002	0.022
	Female	320	12.07	4.07			

Note. ** $p < 0.001$, * $p < 0.01$; DERS = Difficult in Emotional Regulation Scale; BFI (E) = Big Five Inventory (extraversion); BFI (N) = Big Five Inventory (neuroticism); BFI (A) = Big Five Inventory (agreeableness); BFI (C) = Big Five Inventory (conscientiousness); BFI (O) = Big Five Inventory (openess to experience); PS = Prosociality Scale; UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); UPPS (SS) = Impulsivity Behavior Scale (sensation seeking).

Partial Pearson's correlations were computed to examine the connections between the primary variables under investigation in the study. Separate correlation analyses were conducted for each group to explore potential relationships between the total score of the IAT and other variables, while controlling for sex. Furthermore, significant correlation coefficients from the two groups were subjected to comparison using Fisher's z-test.

Regarding technological variables, IAT was positively related to BSMAS, SMES, IGDS, the "communication disturbance" and "phone obsession" dimensions of Phubbing, and FoMO. For clarity, all significant correlations pertaining to both male and female groups were documented in Table 22a. The only statistically significant difference between correlations for the the two groups was found between IAT and IGDS, where the former showed significantly higher correlations compared to the latter ($z = 3.882$, $p < 0.001$).

In Table 22b, we observe all the correlations regarding IAT and the psychological variables included in the study. Both male and female participants presented statistically significant positive correlations between IAT and DERS, the "neuroticism" dimension of BFI, and the "negative urgency," "positive urgency," and "lack of perseverance" dimensions of UPPS. Male participants demonstrated a weak positive correlation between IAT and the "lack of premeditation" dimension of UPPS ($r = 0.130$, $p < 0.01$).

The two groups showed weak, statistically significant negative correlations between IAT and the "extraversion", "agreeableness", and "conscientiousness" dimensions of BFI. For the male group, but not for females, there was a weak negative correlation between IAT and the "openness to experience" dimension of BFI ($r = - 0.094$, $p < 0.01$).

Neither group showed statistically significant correlations between IAT and prosociality, nor between IAT and the "sensation seeking" dimension of UPPS. No statistically significant difference was found in these correlations.

Table 22a. Correlation coefficients (Pearson's r) – Technological variables (Study 4).

	BMSAS	SMES	IGDS	PHUB (CD)	PHUB (OBS)	FoMO
Male Group						
IAT	**0.731****	**0.350****	**0.637****	**0.434****	**0.559****	**0.480****
N	265	265	188	265	265	265
Female Group						
IAT	**0.728****	**0.399****	**0.298****	**0.499****	**0.566****	**0.450****
N	320	320	125	320	320	320
Comparing correlations						
z	0.077	-0.683	**3.822****	-0.996	-0.123	0.459
p	0.469	0.247	**0.001**	0.160	0.451	0.323

Note. ** $p < 0.001$; * $p < 0.01$; BSMAS = Bergen Social Media Addiction Scale; SMES = Social Media Engagement Scale; IGDS = Internet Gaming Disorder Scale; PHUB (CD) = Phubbing (communication disturbance); PHUB (OBS) = Phubbing (phone obsession); FoMO = Fear of Missing Out;

Table 22b. Correlation coefficients (Pearson's r) – Psychological variables – Part 2 (Study 4).

	DERS	BFI (E)	BFI (N)	BFI (A)	BFI (C)	BFI (O)
Male Group						
IAT	**0.454****	**-0.140***	**0.255****	**-0.140***	**-0.094***	**-0.094***
N	265	265	265	265	265	265
Female Group						
IAT	**0.428****	**-0.133***	**0.312****	**-0.119****	**-0.178****	-0.100
N	320	320	320	320	320	320
Comparing correlations						
z	0.387	0.085	-0.743	-0.256	1.026	0.073
p	0.350	0.466	0.229	0.399	0.153	0.471

Note. ** $p < 0.001$, * $p < 0.01$; DERS = Difficult in Emotional Regulation Scale; BFI (E) = Big Five Inventory (extraversion); BFI (N) = Big Five Inventory (neuroticism); BFI (A) = Big Five Inventory (agreeableness); BFI (C) = Big Five Inventory (conscientiousness); BFI (O) = Big Five Inventory (openess to experience).

Table 22c. Correlation coefficients (Pearson's r) – Psychological variables – Part 2 (Study 4).

	PS	UPPS (NU)	UPPS (PU)	UPPS (LPr)	UPPS (LPe)	UPPS (SS)
Male Group						
IAT	-0.091	**0.278****	**0.182****	**0.130***	**0.173****	0.059
N	265	265	265	265	265	265
Female Group						
IAT	-0.091	**0.298****	**0.220****	0.070	**0.238****	0.047
N	320	320	320	320	320	320
Comparing correlations						
z	0	-0.261	-1.476	0.726	-0.813	0.144
p	0.5	0.397	0.07	0.234	0.208	0.443

Note. ** $p < 0.001$, * $p < 0.01$; PS = Prosociality Scale; UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); UPPS (SS) = Impulsivity Behavior Scale (sensation seeking).

In the analysis focused on the male group (as shown in Table 23a), stepwise multiple linear regression was employed to determine which variables could effectively predict symptoms associated with IA. The results revealed that five predictors accounted for 64.8% of the variance ($R^2 = 0.684$, $F_{(5,182)} = 66.98$, $p < 0.001$). Specifically, the BSMAS emerged as a significant predictor of IAT scores ($\beta = 0.436$, $p < 0.001$). Additionally, IGD ($\beta = 0.319$, $p < 0.001$), "phone obsession" associated with Phubbing ($\beta = 0.164$, $p < 0.005$), the "awareness" dimension of the DERS ($\beta = 0.177$, $p < 0.005$), and the "non-acceptance" dimension of DERS ($\beta = -0.124$, $p < 0.05$) also exhibited significant predictive relationships with IAT scores.

In the analysis specific to the female group (referenced in Table 23b), four predictors collectively accounted for 58.7% of the variance ($R^2 = 0.587$, $F_{(4,120)} = 42.616$, $p < 0.001$). Notably, there were no significant concerns regarding multicollinearity issues within the regression model. The study highlighted that the BSMAS was a notable predictor of IAT scores ($\beta = 0.593$, $p < 0.001$). Additionally, "communication disturbance" linked with Phubbing ($\beta = 0.255$, $p < 0.001$), IGDS ($\beta = 0.182$, $p < 0.01$), and prosociality ($\beta = -0.156$, $p < 0.05$) exhibited significant associations with IAT scores among the female group.

Table 23a. Multiple linear regression of IAT predictors in the Male group (Study 4).

	B	SE B	β	p
(Constant)	6.723	2.653		.012
BMSAS	.985	.138	.436	.001
IGDS	.576	.098	.319	.001
PHUB (OBS)	.578	.098	.164	.002
DERS (AW)	.406	.137	.177	.004
DERS (NA)	-.210	.098	-.124	.034
$R^2 = 0.684$, $F_{(5,182)} = 66.98$, $p < 0.001$				

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale; PHUB (OBS) = Phubbing (phone obsession); DERS (AW) = DERS (awareness); DERS (NA) = DERS (non acceptance).

Table 23b. Multiple linear regression of IAT predictors in the Female group (Study 4).

	B	SE B	β	p
(Constant)	19.228	5.022		.001
BMSAS	1.301	.140	.593	.001
PHUB (CD)	.692	.170	.255	.001
IGDS	.356	.116	.182	.003
PS	-.181	.069	-.156	.010
$R^2 = 0.587$, $F_{(4,120)} = 42.616$, $p < 0.001$				

Note. BSMAS = Bergen Social Media Scale; PHUB (CD) = Phubbing (communication disturbance); IGDS = Internet Gaming Disorder Scale; PS = Prosociality.

5. Study 5

Differences between countries on variables

Technological variables

There was a statistically significant difference in IAT score ($F_{(3,671)} = 11.45$, $p < 0.001$, $\eta^2 = 0.05$), among the groups. Italian participants ($M = 2.24$; $SD = 0.52$) had higher scores than their Spanish ($M = 1.93$, $SD = 0.51$); ($MD = 0.32$, $p < 0.001$), Ecuadorian ($M = 2.00$; $SD = 0.56$); ($MD = 0.24$, $p < 0.001$), and Peruvian counterparts ($M = 2.05$; $SD = 0.56$); ($MD = 0.25$, $p < 0.001$). For the BSMAS, significant difference was observed ($F_{(3,671)} = 11.58$, $p < 0.001$, $\eta^2 = 0.05$). Italian participants reported lower scores ($M = 2.01$; $SD = 0.70$) compared to Spanish ($M = 2.44$; $SD = 0.72$; $MD = -0.43$, $p < 0.001$), Ecuadorian ($M = 2.29$; $SD = 0.76$; $MD = -0.29$, $p < 0.001$, and Peruvian participants ($M = 2.36$; $SD = 0.76$; $MD = -0.35$, $p < 0.001$). No significant differences were found among the Spanish, Ecuadorian, and Peruvian samples regarding the SMES score ($p = 0.263$). The IGDS, also showed significant differences ($F_{(3,671)} = 3.04$, $p < 0.05$, $\eta^2 = 0.01$). The Italian group had lower scores ($M = 1.57$; $SD = 0.59$) compared to the Peruvian group ($M = 1.84$; $SD = 0.83$; $MD = -0.28$, $p < 0.05$).

For Phubbing, significant difference were found in the "communication disturbance" dimension ($F_{(3,671)} = 3.56$, $p < 0.05$, $\eta^2 = 0.02$). Italian participants scored higher ($M = 2.39$; $SD = 0.58$) than the Peruvian participants ($M = 2.17$; $SD = 0.71$; $MD = 0.21$, $p < 0.05$). However, no significant differences were found among countries in the "phone obsession" dimension ($p = 0.06$).

Regarding FoMO, there were significant differences among groups ($F_{(3,671)} = 10.47$, $p < 0.001$, $\eta^2 = 0.05$). Italian participants ($M = 2.51$, $SD = 0.70$) scored higher than Ecuadorian ($M = 2.27$, $SD = 0.71$, $MD = 0.28$, $p < 0.001$) and Peruvian participants ($M = 2.13$, $SD = 0.69$, $MD = 0.38$, $p < 0.001$). Spanish participants ($M = 2.37$, $SD = 0.68$) also reported higher scores than Peruvian participants ($MD = 0.24$, $p < 0.01$). No significant difference was found between the Italian and Spanish groups ($p = 0.31$).

Detailed statistical results related to PUI variables can be found in Table 24a.

Table 24a. Differences between groups on Technological variables (Study 5).

	Groups	n	M	SD	F	P	ή2
IAT	Italian	186	2.24	0.52	11.45	0.001	0.049
	Spanish	164	1.93	0.51			
	Ecuadorian	171	2.00	0.56			
	Peruvian	154	2.00	0.60			
BSMAS	Italian	186	2.01	0.70	11.58	0.001	0.049
	Spanish	164	2.44	0.72			
	Ecuadorian	171	2.29	0.76			
	Peruvian	154	2.36	0.76			
SMES	Italian	186	3.12	0.92	1.33	0.263	0.006
	Spanish	164	3.26	0.97			
	Ecuadorian	171	3.32	0.95			
	Peruvian	154	3.23	1.03			
IGDS	Italian	147	1.57	0.59	3.04	0.030	0.014
	Spanish	80	1.68	0.64			
	Ecuadorian	87	1.77	0.82			
	Peruvian	74	1.84	0.83			
PHUB (CD)	Italian	186	2.39	0.58	3.56	0.014	0.016
	Spanish	164	2.22	0.72			
	Ecuadorian	171	2.32	0.69			
	Peruvian	154	2.17	0.71			
PHUB (OBS)	Italian	186	3.08	0.64	2.48	0.060	0.011
	Spanish	164	3.17	0.62			
	Ecuadorian	171	3.23	0.78			
	Peruvian	154	3.03	0.77			
FoMO	Italian	186	2.51	0.70	10.47	0.001	0.045
	Spanish	164	2.37	0.68			
	Ecuadorian	171	2.27	0.71			
	Peruvian	154	2.13	0.69			

Note. BSMAS = Bergen Social Media Addiction Scale; SMES = Social Media Engagement Scale; IGDS = Internet Gaming Disorder Scale; PHUB (CD) = Phubbing (communication disturbance); PHUB (OBS) = Phubbing (phone obsession); FoMO = Fear of Missing Out.

Personological variables

Regarding the DERS, there was a statistically significant difference between groups ($F_{(3,671)} = 2.88$, $p < 0.05$, $\eta^2 = 0.01$). Italian participants ($M = 2.65$; $SD = 0.66$) scored higher than Spanish participants ($M = 2.44$; $SD = 0.69$; $MD = 0.20$, $p < 0.05$). No other significant differences were found among the other samples.

For the "extraversion" dimension of the BFI, there was a significant difference between groups ($F_{(3,671)} = 4.39$, $p < 0.01$, $\eta^2 = 0.019$). Spanish participants showed higher scores ($M = 3.85$, $SD = 0.92$) compared to both Italian ($M = 3.52$, $SD = 0.95$; $MD = 0.34$, $p < 0.01$) and Peruvian participants ($M = 3.54$, $SD = 1.07$; $MD = 0.31$, $p < 0.05$).

In the "neuroticism" dimension, there was a significant difference between groups ($F_{(3,671)} = 17.22$, $p < 0.001$, $\eta^2 = 0.07$). Italian participants scored higher ($M = 3.44$, SD = 0.91) than Spanish ($M = 2.72$, $SD = 0.96$; $MD = -0.72$, $p < 0.001$), Ecuadorian ($M = 3.05$, $SD = 0.96$; $MD = 0.38$, $p < 0.001$), and Peruvian participants ($M = 3.00$, $SD = 0.95$; $MD = 0.44$, $p < 0.001$). Additionally, Spanish participants reported lower levels of “neuroticism” compared to Ecuadorian participants ($MD = 0.33$, $p < 0.01$).

For the "agreeableness" dimension, there was a significant difference between groups ($F_{(3,671)} = 4.85$, $p < 0.005$, $\eta^2 = 0.02$). Italian participants ($M = 3.44$, $SD = 0.91$) scored lower than both Spanish ($M = 2.72$, $SD = 0.96$; $MD = -0.22$, $p < 0.05$) and Ecuadorian participants ($M = 2.72$, $SD = 0.96$; $MD = -0.26$, $p < 0.005$).

The "openness to experience" dimension showed a significant difference between groups ($F_{(3,671)} = 6.20$, $p < 0.001$, $\eta^2 = 0.03$). Italian participants had lower scores (M = 3.52, SD = 0.96) than Ecuadorian (M = 3.79, SD = 0.85; MD = -0.26, $p < 0.05$) and Peruvian participants (M = 3.84, SD = 0.78; MD = -0.32, $p < 0.005$). Similarly, Spanish participants (M = 3.54, SD = 0.85) scored lower than both Ecuadorian (M = 3.79, SD = 0.85; MD = -0.25, $p < 0.05$) and Peruvian participants (M = 3.84, SD = 0.78; MD = -0.30, $p < 0.01$). No significant differences were found among countries in "conscientiousness" ($p = 0.10$).

Regarding prosocial behavior, there was a significant difference between groups ($F_{(3,671)} = 5.76$, $p < 0.001$, $\eta^2 = 0.03$). Italian participants (M = 3.96, SD = 0.65) scored higher than Peruvian participants (M = 3.75, SD = 0.61; MD = 0.22, $p < 0.01$). Spanish participants (M = 4.01, SD = 0.56) also scored higher than Peruvian participants (MD = 0.27, $p < 0.001$).

For the UPPS, a significant difference was found in the "lack of perseverance" dimension ($F_{(3,671)} = 5.42$, $p < 0.001$, $\eta^2 = 0.02$). Italian participants reported higher scores (M = 2.39, SD = 1.01) than Spanish (M = 2.10, SD = 0.75; MD = 0.29, $p < 0.01$), Ecuadorian (M = 2.09, SD = 0.72; MD = 0.30, $p < 0.005$), and Peruvian participants (M = 2.14, SD = 0.78; MD = 0.25, $p < 0.05$). In the "negative urgency" dimension, there was a significant difference between groups ($F_{(3,671)} = 2.65$, $p < 0.05$, $\eta^2 = 0.01$). Ecuadorian participants reported higher scores (M = 3.08, SD = 0.91) compared to Peruvian participants (M = 2.78, SD = 0.91; MD = 0.30, $p < 0.05$). No significant differences were observed in the "positive urgency" ($p = 0.143$), "lack of premeditation" ($p = 0.397$), or "sensation-seeking" dimensions ($p = 0.065$). Table 24b presents the specific results.

Table 24b. Differences between groups on Personological variables (Study 5).

	Groups	n	M	SD	F	P	ή2
DERS	Italian	186	2.65	0.66	2.88	0.035	0.013
	Spanish	164	2.44	0.69			
	Ecuadorian	171	2.57	0.80			
	Peruvian	154	2.48	0.68			
BFI (E)	Italian	186	3.52	0.95	4.38	0.005	0.019
	Spanish	164	3.85	0.92			
	Ecuadorian	171	3.58	0.87			
	Peruvian	154	3.54	1.07			
BFI (N)	Italian	186	3.44	0.91	17.22	0.001	0.071
	Spanish	164	2.72	0.96			
	Ecuadorian	171	3.05	0.96			
	Peruvian	154	3.00	0.95			
BFI (A)	Italian	147	4.06	0.73	4.85	0.002	0.021
	Spanish	80	4.27	0.61			
	Ecuadorian	87	4.31	0.67			
	Peruvian	74	4.23	0.74			
BFI (C)	Italian	186	3.98	0.90	2.11	0.098	0.009
	Spanish	164	3.97	0.67			
	Ecuadorian	171	4.14	0.71			
	Peruvian	154	4.11	0.73			
BFI (O)	Italian	186	3.52	0.96	6.20	0.001	0.027
	Spanish	164	3.54	0.85			
	Ecuadorian	171	3.79	0.85			
	Peruvian	154	3.84	0.78			
PS	Italian	186	3.96	0.65	5.76	0.001	0.025
	Spanish	164	4.01	0.56			
	Ecuadorian	171	3.89	0.61			
	Peruvian	154	3.75	0.61			
UPPS (NU)	Italian	186	2.95	1.00	2.65	0.048	0.012
	Spanish	164	2.87	1.13			
	Ecuadorian	171	3.08	0.91			
	Peruvian	154	2.78	0.91			
UPPS (PU)	Italian	186	2.89	0.87	1.81	0.143	0.008
	Spanish	164	2.95	0.84			
	Ecuadorian	171	3.09	0.78			
	Peruvian	154	2.99	0.75			
UPPS (LPr)	Italian	186	2.16	0.77	0.99	0.397	0.004
	Spanish	164	2.27	0.75			
	Ecuadorian	171	2.25	0.70			
	Peruvian	154	2.17	0.77			
UPPS (LPe)	Italian	186	2.39	1.01	5.42	0.001	0.024
	Spanish	164	2.10	0.75			
	Ecuadorian	171	2.09	0.72			
	Peruvian	154	2.14	0.78			

UPPS (SS)	Italian	186	3.07	0.89	2.42	0.065	0.011
	Spanish	164	3.15	0.98			
	Ecuadorian	171	3.30	0.95			
	Peruvian	154	3.19	0.84			

Note. DERS = Difficult in Emotional Regulation Scale; BFI (E) = Big Five Inventory (extraversion); BFI (N) = Big Five Inventory (neuroticism); BFI (A) = Big Five Inventory (agreeableness); BFI (C) = Big Five Inventory (conscientiousness); BFI (O) = Big Five Inventory (openess to experience); PS = Prosociality Scale; UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); UPPS (SS) = Impulsivity Behavior Scale (sensation seeking).

Correlations between variables among countries

Technological Variables

We investigated the relationships between IA scores and various technological variables using bivariate Pearson's correlations. Separate correlation analyses were conducted for each country to identify any unique relationships. Across all four countries, positive correlations were observed between IA scores and all other variables associated with problematic Internet use, including BSMAS, SMES, IGDS, Phubbing, and FoMO. Detailed statistical results are presented in Table 25a.

Table 25a. Correlation coefficients (Pearson's r) – Technological variables (Study 5).

	BMSAS	SMES	IGDS	PHUB (CD)	PHUB (OBS)	FoMO
Italy						
IAT	**0.750****	**0.242****	**0.571****	**0.442****	**0.523****	**0.464****
N	186	186	147	186	186	186
Spain						
IAT	**0.735****	**0.296****	**0.633****	**0.483****	**0.542****	**0.515****
N	164	164	80	164	164	164
Ecuador						
IAT	**0.738****	**0.318****	**0.649****	**0.401****	**0.542****	**0.430****
N	171	171	87	171	171	171
Perù						
IAT	**0.763****	**0.380****	**0.686****	**0.469****	**0.566****	**0.560****
N	154	154	74	154	154	154

Note. ** $p < 0.001$; BSMAS = Bergen Social Media Addiction Scale; SMES = Social Media Engagement Scale; IGDS = Internet Gaming Disorder Scale; PHUB (CD) = Phubbing (communication disturbance); PHUB (OBS) = Phubbing (phone obsession); FoMO = Fear of Missing Out.

Personological Variables

The correlation analysis revealed positive correlations between the IAT scores and several personological variables across all countries. Detailed statistical results can be found in Table 25b. Specifically, there were positive correlations between IAT and the DERS, the "neuroticism" dimension of the BFI, and the "negative urgency" dimension of the UPPS. Additionally, the "positive urgency" dimension of the UPPS showed positive correlations with IAT in all countries except Peru, while the "lack of perseverance" dimension was positively correlated with IAT in all countries except Spain. The DERS, the "neuroticism" dimension of BFI, and the "negative urgency" dimension of UPPS showed positive correlations with IAT across all countries. The "positive urgency" and "lack of perseverance" dimensions of UPPS were positively correlated with IAT in all countries except for Peru and Spain, respectively. The "lack of premeditation" dimension of UPPS displayed positive correlations with IAT in Peru and Ecuador. Negative correlations were observed between IAT and the "extraversion", "agreeableness", and "openness to experience" dimensions of BFI, as well as the prosociality dimension, but only in the Peruvian sample. The "conscientiousness" dimension of BFI was negatively correlated with IAT in both the Italian and Peruvian samples. Lastly, no statistically significant correlations were observed between IAT and the "sensation-seeking" dimension of UPPS in any of the four samples.

Table 25b. Correlation coefficients (Pearson's r) – Personological variables – Part 1 (Study 5).

	DERS	BFI(E)	BFI(N)	BFI(A)	BFI(C)	BFI(O)
Italy						
IAT	**0.426****	-0.122	**0.386****	-0.020	**-0.332****	0.055
N	186	186	186	186	186	186
Spain						
IAT	**0.435****	-0.065	**0.278****	-0.129	-0.065	-0.085
N	164	164	164	164	164	164
Ecuador						
IAT	**0.310****	-0.086	**0.298****	-0.080	-0.119	-0.034
N	171	171	171	171	171	171
Perù						
IAT	**0.458****	**-0.359****	**0.193***	**-0.365****	**-0.325****	**-0.258****
N	154	154	154	154	154	154

Note. * $p < 0.05$, ** $p < 0.01$; DERS = Difficult in Emotional Regulation Scale; BFI (E) = Big Five Inventory (extraversion); BFI (N) = Big Five Inventory (neuroticism); BFI (A) = Big Five Inventory (agreeableness); BFI (C) = Big Five Inventory (conscientiousness); BFI (O) = Big Five Inventory (openess to experience).

Table 25c. Correlation coefficients (Pearson's r) – Personological variables – Part 2 (Study 5).

	PS	UPPS (NU)	UPPS (PU)	UPPS (LPr)	UPPS (LPe)	UPPS (SS)
Italy						
IAT	0.062	**0.247****	**0.262****	0.017	**0.335****	-0.013
N	186	186	186	186	186	186
Spain						
IAT	-0.080	**0.361****	**0.230****	0.101	0.135	0.014
N	164	164	164	164	164	164
Ecuador						
IAT	0.032	**0.302****	**0.245****	**0.157***	**0.195***	0.100
N	171	171	171	171	171	171
Perù						
IAT	**-0.287****	**0.299****	0.145	**0.345****	**0.259****	-0.066
N	154	154	154	154	154	154

Note. * $p < 0.05$, ** $p < 0.01$; PS = Prosociality Scale; UPPS (NU) = Impulsivity Behavior Scale (negative urgency); UPPS (PU) = Impulsivity Behavior Scale (positive urgency); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation); UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); UPPS (SS) = Impulsivity Behavior Scale (sensation seeking).

To identify variables that significantly predict IA, we conducted stepwise linear regression analyses separately for each country. For the Italian sample four significant predictors collectively explained 71.4% of the variance in IAT scores (R^2= 0.714, $F_{(4,142)}$ = 91.93, $p < 0.001$). Specifically, the BSMAS (β = 0.513, $p < 0.001$) and the IGDS significantly predicted IAT (β = 0.302, $p < 0.001$). The "lack of perseverance" dimension from the UPPS (β = 0.181, $p < 0.001$) and the "phone obsession" dimension from the Phubbing scale (β = 0.169, $p < 0.01$) were also significant predictors (Table 26).

Table 26. Multiple linear regression of IAT predictors in the Italian sample (Study 5).

	B	SE B	β	p	VIF
(Constant)	0.441	0.125	-	0.001	-
BMSAS	0.379	0.043	0.513	0.001	1.76
IGDS	0.270	0.044	0.302	0.000	1.24
UPPS (LPe)	0.096	0.025	0.181	0.000	1.16
PHUB (OBS)	0.133	0.069	0.169	0.010	1.63
R^2 = 0.714, $F_{(4,142)}$ = 91.93, $p < 0.001$					

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale; UPPS (LPe) = Impulsivity Behavior Scale (lack of perseverance); PHUB (OBS) = Phubbing (phone obsession).

For the Spanish sample, five significant predictors have been identified, collectively explaining 68.6% of the variance in IAT scores (R^2= 0.686, $F_{(5,74)}$ = 35.57, $p < 0.001$). The BSMAS was a significant predictor (β = 0.307, $p < 0.001$). IGDS significantly predicted IAT scores (β = 0.427, $p < 0.001$). The "phone obsession" dimension of the Phubbing scale also emerged as a significant predictor (β = 0.208, $p < 0.01$). Additionally,

the DERS (β = 0.171, p < 0.05) and the "lack of premeditation" dimension from the UPPS (β = 0.145, p < 0.05) were significant predictors (Table 27).

Table 27. Multiple linear regression of IAT predictors in the Spanish sample (Study 5).

	B	SE B	β	p	VIF
(Constant)	-0.415	0.234	-	0.080	-
BMSAS	0.235	0.069	0.307	0.001	2.02
IGDS	0.392	0.064	0.427	0.000	1.21
PHUB (OBS)	0.183	0.069	0.208	0.010	1.56
DERS	0.149	0.061	0.171	0.017	1.24
UPPS (LPr)	0.116	0.052	0.145	0.027	1.04
$R^2 = 0.686$, $F_{(5,74)} = 35.57$, $p < 0.001$					

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale; PHUB (OBS) = Phubbing (phone obsession); UPPS (LPr) = Impulsivity Behavior Scale (lack of premeditation).

For the Ecuadorian sample, two significant predictors were identified, which collectively explained 66.7% of the variance in IAT (R_2= 0.667, $F_{(2,84)}$ = 87.1, p < 0.001). The BSMAS was found to be a significant predictor of IAT (β = 0.534, p < 0.001). Additionally, the IGDS also significantly predicted IAT (β = 0.470, p < 0.001). The results for the Ecuadorian sample are presented in Table 28.

Table 28. Multiple linear regression of IAT predictors in the Ecuadorian sample (Study 5).

	B	SE B	β	p	VIF
(Constant)	0.463	0.131	-	0.001	-
BMSAS	0.424	0.052	0.534	0.000	1.27
IGDS	0.354	0.050	0.470	0.000	1.27
$R^2 = 0.667$, $F_{(2,84)} = 87.1$, $p < 0.001$					

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale.

For the Peruvian sample, two significant predictors that together explained 77.5% of the variance in IAT scores (R^2= 0.775, $F_{(2,71)}$ = 126.88, p < 0.001). The BSMAS was a significant predictor of IAT (β = 0.676, p < 0.001). Additionally, the IGDS also significantly predicted IAT (β = 0.304, p < 0.001). See Table 29.

Table 29. Multiple linear regression of IAT predictors in the Peruvian sample (Study 5).

	B	SE B	β	p	VIF
(Constant)	0.322	0.117	-	0.007	-
BMSAS	0.564	0.056	0.676	0.000	1.47
IGDS	0.244	0.054	0.304	0.000	1.47
$R^2 = 0.775$, $F_{(2,71)} = 126.88$, $p < 0.001$					

Note. BSMAS = Bergen Social Media Scale; IGDS = Internet Gaming Disorder Scale.

Discussion and Conclusions

1. Study 1

1.1. Discussion of the results

The first study investigated the associations between IA and factors tied to problematic social media usage, such as SMA and FoMO, along with the link between IA and emotional dysregulation. Despite the extensive research on this topic, this study aimed to delve deeper into the role of emotional dysregulation and the interplay of Internet-related factors in fostering IA.

The results largely supported the initial hypotheses. Confirming the first hypothesis (H1), IA was found to have strong positive correlations with SMA, FoMO, emotional dysregulation, and neuroticism, and a weak negative correlation with conscientiousness. Additionally, significant interrelationships among these variables were observed, suggesting a cyclical pattern where emotional dysregulation exacerbates problematic social media use and FoMO, leading to more severe IA. This aligns with the pathways hypothesis observed in other behavioral dependencies like gambling, as theorized by Blaszczynski and Nower (2002), Ledgerwood and Petry (2010), and Valleur et al. (2016), which suggest that individuals with poor emotional coping skills and heightened levels of depression, anxiety, and emotional dysregulation often turn to addictive behaviors as a way to alleviate these negative states.

Moreover, a predisposition to impulsivity and high levels of neuroticism appear to contribute to compulsive behaviors. Griffiths (2000) noted that excessive Internet use often involves seeking online social interactions, with compulsive behaviors reinforcing this pattern and potentially leading to SMA.

SMA, characterized by the compulsive use of social media platforms, is a common form of IA (Hou et al., 2019; Starcevic, 2013). Research by Oberst et al. (2017) indicated that engaging in social networks can enhance the sense of belonging, particularly among socially vulnerable groups, but may also increase FoMO. This study's findings indicated a positive correlation between SMA and FoMO, suggesting that participants may use social media to meet their need for connection, which could foster addictive behaviors.

Conscientiousness was identified as a protective factor against "unproductive" behavioral addictions, such as those involving Facebook, video games, or the Internet, while neuroticism was confirmed as a general risk factor for developing psychopathology,

consistent with existing literature (Andreassen et al., 2013; Gnisci et al., 2011; Hwang et al., 2014).

The second hypothesis (H2) was also confirmed: the mediation model demonstrated a direct effect of emotional dysregulation on IA, underscoring the pivotal role of emotional regulation in the development of IA. Prior studies have consistently shown that individuals with IA, particularly adolescents, struggle with emotional regulation, often due to excessive suppression and inadequate cognitive reappraisal (Karaer & Akfemir, 2019; Hormes, 2014; Liang et al., 2021). This study found that emotional dysregulation was strongly linked to increased negative emotions and IA, aligning with findings from Amendola et al. (2019), who identified dimensions of "non-acceptance" and "goals" as predictors of PUI.

The third hypothesis (H3) was validated as well: the final mediation model illustrated that emotional dysregulation influences FoMO and problematic social media use, which in turn affect IA. Although numerous studies have examined the link between FoMO and problematic smartphone use (Clayton et al., 2015; Lo Coco et al., 2020) and SMA (Dempsey et al., 2019; Varchetta et al., 2020), the relationship between FoMO and emotional dysregulation has been less explored. This study highlights a significant impact of emotional dysregulation on FoMO, demonstrating a direct relationship where increases in one predict increases in the other. A similar direct relationship was observed between emotional dysregulation and SMA, emphasizing the critical role of emotional regulation in behavioral addictions. These findings are consistent with prior research showing a strong connection between difficulties in emotional regulation and problematic social media use (Gioia, Rega, Boursier, 2019). Collectively, the significant relationships among these three variables influenced IA, confirming the direct effects of emotional dysregulation, FoMO, and SMA on the potential development of pathological Internet-related behaviors.

1.2. Conclusion, limitations and future research lines

The findings of this study provide valuable insights into the role of emotional dysregulation in the development of pathological Internet behaviors. The mediation pathways tested, grounded in theoretical models and prior research, suggest that emotional dysregulation may mediate the emergence of addictive behaviors. The results

indicate that emotional dysregulation can be viewed as an independent factor and direct predictor of both IA and variables linked to problematic social media use. Overall, this study highlights the critical role of emotional regulation in understanding IA.

Several limitations of this study must be acknowledged. Firstly, the cross-sectional design prevents drawing causal conclusions and establishing the direction of effects. It's possible that emotional dysregulation and IA exert mutual influences or that emotional dysregulation develops after the onset of IA. Additionally, the study relied solely on self-report measures to assess IA and related variables, which limits the clinical implications of the results as self-reports cannot provide diagnoses. The study sample might have been affected by selection bias, as the questionnaires were more accessible to certain groups. Lastly, the lack of data on participants' psychiatric histories could have influenced the interpretation of the results.

Future research should focus on identifying specific personality traits and interventions that can reduce the maladaptive aspects of IA while enhancing its adaptive aspects. Studies should explore models that deepen our understanding of the relationship between emotional regulation and its adaptive and maladaptive effects. Such investigations could aid in developing more effective methods for assessing and treating IA and evaluating outcomes related to emotional regulation. Research should also aim to replicate the current findings and examine how various factors, such as gender differences, might influence or be influenced by emotional dysregulation in diverse populations (e.g., college students vs. non-college-educated adults, young vs. older adults, clinical vs. non-clinical samples). Lastly, the causal hypotheses of this study should be tested and validated through longitudinal or experimental research to provide more robust evidence of the relationships observed.

2. Study 2

2.1. Discussion of the results

The objective of the second study was to identify the risk factors and mechanisms that predispose individuals to disorders related to the use of technological tools. To achieve this, we examined how the relationship between IA and certain psychological variables could influence its onset. After a thorough review of the literature, we decided to explore the impact of gender, marital status, cohabitation, emotions, personality traits, and new social phenomena on the development of IA. Our starting point was our previous study (Quaglieri et al., 2022) on a sample of Italian young adults. We sought to determine if analyzing data from a different context and language (Spanish university students) would yield similar results, thereby supporting existing literature and enabling generalization to other socio-cultural contexts. Consequently, we considered the same variables and conducted similar analyses as in the previous study.

Based on our assumptions, the results largely confirmed our expectations. Specifically, the first hypothesis (H1) was validated, as IA was positively correlated with SMA, FoMO, Emotional (Dys)regulation, and, albeit weakly, with the Neuroticism dimension of the Big Five personality traits. Similarly, there was a positive correlation among SMA, FoMO, Emotional (Dys)regulation, and neuroticism. Additionally, IA was negatively and significantly related to the conscientiousness dimension of the Big Five.

The second hypothesis (H2) was also confirmed: although there was no direct effect, the model demonstrated a total effect of emotional (dys)regulation on IA. This suggests that emotional dysregulation could be a precursor to IA, albeit indirectly: its effect on IA is mediated by FoMO and SMA. Difficulties in regulating emotions and understanding one's own and others' emotional states may lead users to engage in maladaptive behaviors on social media, expressing anxiety and concern that others are having more rewarding experiences, and compulsively comparing their lives with others in a bid to appear happier. These three elements predict the development of maladaptive Internet use, specifically the presence of addictive symptoms associated with Internet use. This finding indicates that for this specific population, difficulty in regulating and recognizing emotions does not necessarily predict the development of IA. Instead, individuals struggling with emotional regulation are more likely to exhibit signs of IA due to excessive and compulsive social media use, social anxiety from constant comparison with

others, and an overwhelming need to stay connected for FoMO. These results slightly differ from the Italian sample (Quaglieri et al., 2022), where emotional dysregulation directly predicted IA.

Lastly, as observed in our initial study (Quaglieri et al., 2022), the final mediation model showed the influence of emotional dysregulation on FoMO and problematic social media use, which subsequently affected IA. However, there was no direct effect of emotional dysregulation on IA, a notable difference from the Italian sample analyzed by Quaglieri et al. (2022), where emotional dysregulation had direct, indirect, and total effects on IA. In the Spanish sample, emotional dysregulation did not directly affect IA but did influence FoMO and problematic social media use, collectively impacting the potential onset of IA. These findings align with Lo Coco et al. (2020).

The direct effect of difficulties in regulating emotions on problematic smartphone and social media use has been observed in various studies (Elhai et al., 2016; Elhai et al., 2018; Gioia, Rega & Boursier, 2021). Additionally, other research supports the direct relationship between SMA and FoMO (Varchetta et al., 2020; Dempsey et al., 2019; Casale & Fioravanti, 2020).

For our reference sample, the personality trait of neuroticism, characterized by high vulnerability, insecurity, and emotional instability, could partly explain the onset of IA. Similar results have been found in several studies (Blackwell et al., 2017; Tang et al., 2016; Andreassen et al., 2013). However, in the Italian sample, neuroticism did not seem to be a risk factor for developing IA. Moreover, despite Quaglieri et al. (2022) identifying conscientiousness as a protective factor against the pathological use of digital platforms, this trait did not appear to prevent Internet overuse in this specific case.

Additionally, since most of the sample consisted of women, gender could not be considered a variable between subjects but only as a covariate, yet it seems to play a significant role. Women have shown more frequent symptoms associated with SMA (Stevens et al., 2021; Varchetta et al., 2020; Andreassen et al., 2017). In the mediation model analyzed, these variables were not investigated in Quaglieri et al. (2022).

2.2. Conclusion, limitations and future research lines

The results of this study contribute significantly to our understanding of the role emotional dysregulation plays in the development of pathological Internet behaviors. By

exploring mediation pathways grounded in established theoretical models, we found that emotional dysregulation is a critical factor and direct predictor of IA and associated problematic social media use variables. These findings underscore the importance of addressing emotional regulation in interventions aimed at mitigating IA.

Several limitations of this study need to be acknowledged. Firstly, the sample was limited by self-selection, lack of diversity, and a relatively small number of participants, which restricts the generalizability of the findings. Research based on general population samples, rather than clinical ones, tends to be exploratory, complicating the identification of psychological alterations necessary for a comprehensive understanding of the disorder's various aspects. Additionally, the reliance on self-report methodology may have led to socially desirable responses, skewing the data. Importantly, the study did not account for the psychiatric history or the presence of mental disorders among participants, which could significantly impact the development of maladaptive Internet use. Numerous studies have shown that mental health issues such as ADHD, depression, PTSD, sleep disorders, OCD, and eating disorders are often comorbid with problematic Internet use (Szczygieł & Podwalski, 2020; Leménager et al., 2018).

Socio-demographic factors like marital status and living conditions were also not sufficiently considered, though they could influence Internet use patterns. The predominance of female participants might have affected the interpretation of results, necessitating further research to understand the relationship between gender and technology addictions fully. Furthermore, the study design does not allow for definitive conclusions regarding the directionality of the effects between the variables. It remains unclear whether difficulties in emotional regulation led to increased IA and FoMO or vice versa.

Future research should aim to replicate these findings in more diverse and larger samples to enhance the generalizability of the results. Investigations should include a broader range of variables that may influence or be influenced by technological addictions, with a particular focus on identifying specific risk and protective factors. Exploring the role of socio-demographic factors, such as marital status and living conditions, could provide a deeper understanding of dysfunctional Internet use behaviors.

Research should also aim to clarify the relationship between gender and technology addictions, considering the predominance of female participants in this study.

Longitudinal studies are essential to analyze both the potential causes and consequences of IA over time, providing insights into the directionality of effects. Additionally, it would be beneficial to study these phenomena across different cultural contexts, medical histories, and educational levels to ensure the findings' validity and reliability in a rapidly evolving digital landscape.

Future studies should also examine how individuals transition from normal to problematic Internet and social network use, as suggested by Xu and Tan (2012), focusing on the psychological mechanisms involved. Psychoeducation programs targeting adolescents and young adults could play a crucial role in both prevention and intervention by promoting healthier alternatives to achieve similar rewards provided by Internet use. Overall, these findings highlight the importance of developing comprehensive intervention programs that address the underlying emotional and psychological factors contributing to technological addictions, ultimately aiding in the prevention, awareness, and treatment of affected individuals.

3. Study 3

3.1. Discussion of the results

The third study examined gender differences in Internet use, social media, and related behaviors. It highlighted the unique characteristics of male and female in the potential development of IA, focusing on social media, mobile use, and IGD. Increased Internet use is linked with various social and psychological factors. Researchers often consider demographic factors, including gender, to explain different patterns of IA (Yen et al., 2009; Tang et al., 2017). Despite extensive research, results remain mixed (Aylaz et al., 2015; Sun et al., 2012).

Our first hypothesis (H1) was partially confirmed. Significant gender differences were observed in assessments using the IGDS, BSMAS, the “phone obsession” Subscale of Phubbing Scale, the Need to Control Subscale of FoMOs, the “lack of emotional awareness” Subscale of DERS, Prosociality Scale, and the “lack of perseverance” and “sensation seeking” Subscales of UPPS-P. Generally, males exhibited higher levels of IA and IGD (Anderson et al., 2017; Chen et al., 2015; Bouna-Pyrrou et al., 2015; Spilkova et al., 2017; Laconi et al., 2017; van den Eijnden et al., 2018; Wichstrøm et al., 2019). Even after controlling for age, significant gender differences were found in the "loss of control" IAT dimension, supporting the idea that males exhibit more self-reliance and less IA than females (Charness & Rustichini, 2011; Li, et al., 2021). Moreover, after controlling for age, significant gender-based differences emerged in the “loss of control” IAT dimension.

Consistent with Amendola et al. (2019), males scored higher on the IGDS, indicating higher susceptibility to IGD. This aligns with findings showing men are more likely to spend more time gaming online, potentially causing distress and impairing functioning (APA, 2013). Males also scored higher on the “lack of emotional awareness” Subscale of DERS (Neumann et al., 2010) and showed higher emotional clarity but more difficulty engaging in goal-directed behaviors. Males scored higher on the “lack of perseverance” Subscale of UPPS, indicating impulsivity as a risk factor for IA (Koo & Kwon, 2014; Li et al., 2021; Mottram & Fleming, 2009). Additionally, after controlling for age, the male group showed higher emotional clarity, while the female group reported more difficulties in engaging in goal-directed behaviors.

Females scored higher on the BSMAS, phone obsession, and need to control, indicating greater difficulties regulating social media and phone use. These results align with literature showing a higher prevalence of SMA in females (Andreassen et al., 2017; Martínez-Ferrer et al., 2018; Varchetta et al., 2020). Additionally, females showed a higher need for control, contributing to the development of FoMO (Oberst et al., 2017; Balta et al., 2020; Beyens et al., 2016). Females also scored higher on the Prosociality Scale, suggesting they maintain in-person relationships better while managing phone use effectively (Chotpitayasunondh & Douglas, 2016; Alvarez-Cabrera et al., 2021). Males scored higher on the "sensation seeking" subscale of UPPS, indicating this trait as a risk factor for IA, especially in males (Adan et al., 2016; Fraschetti et al., 2021).

Our second hypothesis (H2) was confirmed. The IAT correlated with all investigated variables, showing relationships with total scores or subscales. In females, IAT positively correlated with SMA, IGD, Phubbing, FoMO, DERS, and impulsivity. In both genders, IA correlated positively with the Prosociality Scale and UPPS ("negative" and "positive urgency" subscales). Significant differences in correlations were found in the BSMAS, IGD, DERS "clarity" dimension, and FoMO scale's "fears that others having rewarding experiences" dimension, indicating a critical role of social media use in developing IA in females and the significance of gaming addiction in males (Varchetta et al., 2020; Laconi et al., 2017; Wichstrøm et al., 2019). The relationship between IAT and FoMO supports that increased FoMO elevates the risk of IA. Our results also suggest that emotion regulation problems are linked to addictive behaviors, confirming previous findings (Schreiber et al., 2012; Yu et al., 2013).

Our third hypothesis (H3) about different variables predicting IA in the two groups was partially confirmed. SMA was the primary predictor of IA in both genders, reaffirming it as a common form of IA (Hou et al., 2019; Quaglieri et al., 2022; Starcevic, 2013). In males, IGD and FoMO's fear subscale were significant predictors, highlighting their roles in IA development. Communication disturbances from Phubbing also predicted IA in males, aligning with findings that men are more likely to exhibit Phubbing behavior (Chi et al., 2022; Graziano & Eisenberg, 1997). The "goals" subscale of DERS was another predictor for males, indicating difficulties in managing negative emotions as a predictor of IA. In females, SMA and phone obsession predicted IA, with higher phone obsession in women linked to checking messages frequently, affecting task completion and

conscientiousness (Błachnio & Przepiorka, 2019; Alvarez-Cabrera et al., 2021; Quaglieri et al., 2022). The “lack of perseverance” subscale of UPPS was also a predictor, suggesting impulsivity's role in IA, especially regarding phone use.

3.2. Conclusion, limitations and future research lines

This study provides valuable insights into the gender-specific development of pathological Internet behaviors, examining how gender differences influence the emergence of addictive behaviors. The results indicate that IA can be predicted by different variables for each gender, with social media overuse being a common factor across both. This analysis offers a nuanced perspective on gender differences, building on previous research and highlighting the importance of considering various underlying variables in understanding IA. Understanding these gender-specific variables is crucial for developing tailored interventions for IA, enhance prevention and treatment efforts.

Several limitations of this study should be considered. The reliance on self-report measures for assessing IA, related variables, and personality traits limits the clinical implications, as these measures do not provide formal diagnoses. Selection bias may have influenced the study sample, as the accessibility of the questionnaires could have skewed participation towards certain groups. Additionally, the absence of data on participants' psychiatric histories could have impacted the interpretation of the findings, as underlying mental health issues are known to interact with Internet use behaviors.

Future research should aim to verify the causal relationships suggested by this study through longitudinal or experimental designs. Employing robust statistical analyses, such as Structural Equation Modelling, and prediction models like machine learning, could provide a deeper understanding of the investigated phenomena and their cause-effect relationships. Further research should also explore whether the detected gender differences in social media use are influenced by the specific purposes for which these platforms are utilized. For example, women may use social media more for maintaining social connections and creating new networks, while men might primarily use these platforms for exchanging information related to online gaming. Identifying specific traits and effective interventions can help reduce the maladaptive aspects of IA while enhancing its adaptive aspects, thereby informing the development of more effective prevention and treatment strategies.

4. Study 4

4.1. Discussion of the results

Building on the findings of Mari et al. (2023), who explored gender differences in IA in an Italian sample, we extended this research to a Spanish context. Our goal was to verify and expand upon their results, contributing to the broader understanding of how these dynamics play out across different cultures.

Our study reinforced the first hypothesis, showing distinct differences between males and females in Internet use and related psychological traits. As seen in the previous study, males scored higher in IA and IGD, aligning with existing research that suggests males are more inclined towards online gaming and various Internet activities (Lemmens et al., 2015; López-Fernández et al., 2019; Müller et al., 2014). On the other hand, females scored higher in the BSMAS, social media engagement, and the "phone obsession" aspect of Phubbing, highlighting their greater propensity for social media use and smartphone reliance (Andreassen et al., 2016; Elhai et al., 2017).

Interestingly, we did not find significant gender differences in the "communication disturbance" aspect of Phubbing and FoMO. This suggests that while there are clear gender distinctions in some Internet behaviors, others, like communication issues and FoMO, are similar across genders. These findings are consistent with previous research by Beyens et al. (2016) and Gil et al. (2015), who reported that although general smartphone usage patterns differ by gender, these specific issues do not.

Our analysis of psychological traits revealed more complexity. Females showed higher levels of emotional dysregulation, reflected in their DERS scores (Gross & John, 2003), suggesting greater difficulty in managing emotions, which might contribute to higher technological addiction, especially social media use (Ergün et al., 2020; Kardefelt-Winther, 2014).

Females also scored higher in “neuroticism”, “agreeableness”, and “conscientiousness” on the BFI, indicating they may be more emotionally sensitive, cooperative, and diligent (Costa & McCrae, 1992). These traits could drive more intensive use of social media and smartphones (Elhai et al., 2017). Zhou et al. (2018) also found that neuroticism and agreeableness significantly related to SMA among female students, suggesting these personality traits might make females more prone to such addictions.

Males, in contrast, scored higher in “sensation seeking” and “lack of perseverance”, traits associated with impulsivity and a desire for novel experiences (Whiteside & Lynam, 2005). These characteristics likely make them more vulnerable to excessive Internet gaming and other risky online behaviors (Kardefelt-Winther, 2014; Smith et al., 2009). This aligns with findings from Brand et al. (2016) showing a link between impulsivity, lack of perseverance, and gaming disorder in males.

Additionally, females showed higher levels of negative urgency according to the UPPS, indicating a tendency to act impulsively when distressed (Cyders & Smith, 2008). This impulsivity might lead them to use online activities as a coping mechanism, increasing the risk of technological addiction (Billieux et al., 2015). Studies by Billieux et al. (2010) and Elhai et al. (2017) have also linked negative urgency to higher IA, particularly in females.

Our study's findings confirmed Hypothesis 2, shedding light on the intricate relationships between IA, technological behaviors, and psychological factors. By using partial Pearson's correlations to control for sex, we aimed to uncover any potential gender differences in these associations. Our analysis revealed significant relationships between the total IAT score and various technological variables.

We found that higher IAT scores were positively correlated with measures of SMA, SMES, IGD, as well as the "communication disturbance" and "phone obsession" dimensions of Phubbing, and FoMO. These results are in line with previous research, including the study by Mari et al. (2023) on an Italian sample, which underscores the diverse nature of IA and its connections to various online activities (Pontes & Griffiths, 2016; Ko et al., 2012).

These findings highlight the complex interplay between IA and different forms of technological engagement, indicating a need for further research to understand how these relationships might differ between genders and impact individuals' online behaviors and mental health. Similar to the observations by Mari et al. (2023), we found a significant difference in the correlation between IAT and IGDS, with males showing a stronger association compared to females. This suggests that IA and IGD might be more closely linked in males, pointing to gender-specific patterns in technological addiction (Balta et al., 2020).

When examining the correlations between IAT and psychological variables, both males and females showed positive correlations with DERS, the "neuroticism" dimension of the BFI, and the "negative urgency," "positive urgency," and "lack of perseverance" dimensions of the UPPS. These findings are consistent with prior studies that emphasize the role of emotional dysregulation and impulsivity in IA (Brand et al., 2016; Billieux et al., 2015; Quaglieri et al., 2022; Mari et al., 2023).

Interestingly, our study revealed weak negative correlations between IAT scores and certain dimensions of the BFI—specifically “extraversion”, “agreeableness”, and “conscientiousness”—for both males and females. However, only males showed a negative correlation with the "openness to experience" dimension, suggesting that personality traits may influence Internet-related behaviors differently between genders, which warrants further investigation (Costa & McCrae, 1992).

Additionally, our analyses did not find significant correlations between IAT scores and Prosociality or the “sensation seeking” dimension of the UPPS. This might be because standard scales like the IAT do not fully capture all dimensions of online behavior or their relationships with social behavior and sensation-seeking tendencies. IA covers a wide range of activities, including gaming, social media use, online shopping, and information seeking, among others. Prosocial behavior and sensation seeking may not directly align with the specific facets of IA measured by these scales.

Moreover, individual differences in Internet use could also affect these correlations. People use the Internet for various purposes, such as social interaction, entertainment, information, or professional activities. These diverse patterns of use can influence how IA relates to prosociality or sensation-seeking tendencies. Therefore, our findings underscore the importance of a nuanced understanding of technological addiction, recognizing that it may not uniformly relate to all aspects of social behavior and sensation-seeking tendencies (Whiteside & Lynam, 2001).

Our study provided strong evidence for Hypothesis 3, demonstrating that different variables serve as predictors of IA in males and females. This analysis reveals the intricate dynamics of online behaviors across genders.

For the male group, our analysis showed that five key predictors explained 64.8% of the variance in IAT scores. Consistent with previous research (Mari et al., 2023; Andreassen et al., 2017; Griffiths et al., 2014; Wang et al., 2015; Chang et al., 2022; Kuss & Griffiths,

2012), we found that SMA and IGD were significant predictors. This highlights the substantial role of social media and online gaming engagement among males prone to IA (Balta et al., 2020). Additionally, the "phone obsession" dimension of Phubbing was a significant predictor, indicating that excessive smartphone use is linked to problematic Internet behaviors in males (Billieux et al., 2015; Elhai et al., 2017).

Our study also emphasized the importance of emotional regulation in understanding male IA. Specifically, the "awareness" and "non-acceptance" dimensions of the DERS were significant predictors of IAT scores. This suggests that males who struggle with recognizing and accepting their emotions are more likely to develop problematic Internet use patterns. These findings align with existing literature on the relationship between emotional regulation difficulties and addictive behaviors, including IA (Brand et al., 2016; Kardefelt-Winther, 2014).

For the female group, we identified four predictors that explained 58.7% of the variance in IAT scores. Notably, the BSMAS was a significant predictor, underscoring the central role of social media engagement in contributing to IA among females (Andreassen et al., 2016; Kardefelt-Winther, 2014). This aligns with previous studies that highlight the impact of social media on addictive behaviors in women.

Other significant predictors for females included the "communication disturbance" dimension of Phubbing, IGD, and Prosociality. Interestingly, we found a negative association between Prosociality and IAT scores, suggesting that females who are more prosocial may be less prone to problematic Internet use (Billieux et al., 2015). This offers a nuanced perspective compared to the Italian sample (Mari et al., 2023), which identified BSMAS, “communication disturbance”, and “lack of perseverance” as predictors of IA.

Our findings are consistent with prior research emphasizing the significant influence of social media engagement (Andreassen et al., 2016), online gaming behaviors (Griffiths et al., 2014; Kiraly et al., 2014), and communication patterns (Kim et al., 2016) on IA across genders. This underscores the multifaceted nature of IA and the different ways it manifests in males and females.

4.2. Conclusion, limitations and future research lines

In conclusion, our study provides valuable insights into gender differences in IA and associated psychological variables within the Spanish context, enhancing the broader

understanding of cross-cultural variations in problematic Internet behaviors. Our findings align with previous literature, highlighting distinct patterns of Internet use and addiction susceptibility between males and females. Specifically, males tend to engage more in online gaming and risk-taking behaviors, whereas females show a stronger inclination towards social media and smartphone usage.

Our results are mostly in line with those observed in the Italian sample (Study 3), reinforcing the robustness of these findings across different cultural contexts. However, some differences emerged that underscore the importance of considering cultural variables. These nuances highlight that while certain trends in IA may be universal, the specific manifestations and associated factors can vary significantly across different cultural settings. This emphasizes the need for culturally sensitive approaches when addressing IA.

Despite these contributions, our study has several limitations that warrant consideration. Firstly, the reliance on convenience sampling may introduce biases and limit the generalizability of our findings to broader populations. Future studies could enhance external validity by using more diverse and representative samples. Secondly, the cross-sectional design of our study precludes establishing causal relationships between variables. Longitudinal research would be valuable in exploring the temporal dynamics and causal pathways underlying IA and its correlates over time. Additionally, the use of self-report measures for assessing IA and psychological variables may be susceptible to response bias and social desirability effects. Future studies could incorporate objective measures and multi-method approaches to improve the reliability and validity of the findings.

Looking ahead, several future research lines are suggested. Our study focused on direct associations between gender, IA, and psychological variables. However, future research could explore potential mediating and moderating factors such as personality traits, coping strategies, and social support to provide a more comprehensive understanding of the mechanisms underlying IA. Moreover, while our study contributes to cross-cultural literature on IA by replicating previous findings within a Spanish sample, it is important to recognize that cultural factors may influence Internet usage patterns differently across various contexts. Although Spain and Italy share some cultural similarities, further research could explicitly compare findings across different cultural settings to elucidate

how cultural factors interact with individual-level variables in shaping IA risks. Understanding these cultural dimensions is crucial for developing culturally sensitive prevention and intervention strategies tailored to the specific needs of diverse populations. By integrating cultural contexts into research on IA, we can advance our understanding of its complex interplay with technology use and psychological well-being, ultimately informing more effective approaches to mitigate its negative impacts.

5. Study 5

5.1. Discussion of the results

This last study aims to investigate potential differences among countries (i.e., Italian, Spanish, Ecuadorian, and Peruvian) in developing risk, and protective factors related to the problematic Internet use. The research employs a comprehensive approach, including psychological, social, and environmental factors to explore the multifaceted nature of Internet-related behaviors. By comparing data across from different cultural contexts, the study offers unique patterns and commonalities that can contribute to a nuanced understanding of the problematic use of the Internet.

The first research question was to explore the existence of potential differences in technological (i.e., IA, SMA, social media wngagement, IGD, Phubbing, FoMO) and personological (Difficulties in Emotional Regulation, personality traits, Prosociality, and impulsivity) variables among Countries (i.e., Italy, Spain, Ecuador, and Peru).

In terms of technological variables, Italy displays higher levels of IA compared to all other countries studied. Conversely, it shows lower levels of SMA compared to those countries. In relation to FoMO, Italy scores higher than Ecuador and Peru, while Spain scores higher than Peru only. Italy also scores higher than Peru in “communication disturbance”, whereas the pattern is reversed in terms of IGD. Regarding personality variables, Italy shows higher scores than all other countries in the “neuroticism” sub-dimension of the BFI-10 and the "lack of perseverance" sub-dimension of the UPPS. In the "negative urgency" sub-dimension, Ecuador scores higher than Peru. The Spanish sample scores lower than Ecuador only in “neuroticism”. Italy scores lower than Spain and Ecuador in the "agreeableness" sub-dimension of the BFI-10 and both Italy and Spain score lower than the Latin American countries in the "openness to experience" sub-dimension. In terms of "extroversion," the Spanish sample scores higher than Italy and Peru. Both Italy and Spain score higher than Peru in prosociality.

Finally, Italy scores higher than Spain in terms of emotional dysregulation.

These findings underscore the significance of considering cultural diversity in studies on Internet-related behaviors and emphasize the need for a comprehensive approach that accounts for various influencing factors. Cultural variations, as described by Hofstede's cultural dimensions theory, may shape individuals' attitudes and behaviors towards technology use, contributing to differences in IA rates across countries (Hofstede, 1980).

For instance, countries with higher levels of individualism such as Italy and Spain may exhibit greater IA rates due to a focus on personal autonomy, whereas more collectivist cultures like Ecuador and Peru may prioritize social harmony, potentially leading to lower rates of certain technological behaviors (Triandis, 1995).

Recent studies have highlighted the influence of cultural dimensions on attitudes and behaviors related to technology use. For example, Lee et al. (2011) emphasized how collectivism shapes psychological adjustment and Internet use, suggesting differences between individualistic cultures such as Italy and Spain and collectivist cultures like Ecuador and Peru. Van Rooij et al. (2018) cautioned against generalizing gaming disorder across cultures, indicating that cultural factors may moderate problematic Internet behaviors.

Personality traits, particularly “neuroticism”, have been consistently linked to higher levels of IA (Montag et al., 2017). The findings showing elevated “neuroticism” scores among Italian participants align with previous research, suggesting a propensity towards problematic nternet use in this population.

Studies by ElhaIi et al. (2017) and Wang et al. (2017) have also highlighted the role of traits like neuroticism and impulsivity in predicting IA. However, it's important to interpret these findings cautiously, avoiding simplistic causal explanations or direct correlations between variables. Triandis (1995) stressed the importance of considering both universal and culture-specific factors in understanding behavior.

Regarding the second research question, strong positive correlations were found across all four samples between the IAT and various variables. These include SMA, social media engagement, IGD, Phubbing, FoMO, and psychological traits like emotional dysregulation, “neuroticism”, and “negative urgency”.

Existing literature supports a direct relationship between symptoms of IA and maladaptive use of social media, IGD (Quaglieri et al., 2022; Mari et al., 2023; Varchetta et al., 2023), and more broadly, Phubbing behavior (Karadag et al., 2015). Specifically, studies have highlighted strong positive correlations between IAT scores and both "communication disturbance" and "phone obsession" aspects of Phubbing. This suggests that individuals who engage in frequent Phubbing behaviors, such as ignoring others due to phone use during conflicts or being excessively obsessed with their phones, are more

likely to score higher on the IAT. This underscores a cross-cultural link between problematic phone use within relationships and broader IA.

The association between emotional dysregulation and PUI has been extensively examined in various cultural contexts and samples, including Chinese adolescents (Liang et al., 2021), Italian university students (Quaglieri et al., 2022), and Spanish university students (Varchetta et al., 2023). Consistently, strong positive correlations indicate that individuals experiencing greater difficulties in emotion regulation are more prone to higher levels of IA as measured by the IAT. This suggests that challenges in regulating emotions may contribute to the onset or intensification of IA.

Moreover, research has shown a strong positive correlation between higher levels of "neuroticism", measured by the BFI, and elevated IAT scores. This highlights a link between specific personality traits, like neuroticism, and increased susceptibility to IA.

The positive correlation observed between FoMO and IA across all samples suggests that individuals who FoMO on social experiences may be more susceptible to PUI. This fear can drive individuals to remain constantly connected online, leading to higher scores on measures of IA. FoMO emerges as a significant factor influencing PUI, reflecting individuals' anxieties about social exclusion and their tendency to remain digitally engaged to avoid missing social opportunities.

Furthermore, strong positive correlations were found between IA scores and certain impulsivity traits across the Italian, Spanish, and Ecuadorian samples. Specifically, higher levels of "negative urgency" (acting impulsively under negative emotions) "and positive urgency" (acting impulsively under positive emotions) were associated with greater PUI. Additionally, a positive correlation was observed between IA scores and "lack of perseverance" across the Italian, Ecuadorian, and Peruvian samples, indicating that individuals who struggle with persistence and easily abandon tasks may be more prone to PUI. These findings are consistent with previous research (Choi et al., 2014; Li et al., 2021), which identifies impulsivity as a risk factor for IA and related behaviors such as pathological gambling.

Interestingly, in both the Italian and Peruvian samples, there was a negative correlation between IA scores and prosocial behavior. This negative correlation suggests that individuals who engage less in altruistic and cooperative behaviors are more likely to exhibit higher levels of PUI.

Regarding the relationship between personality traits and IA, we observed varying results across different samples. Specifically, in the Peruvian sample, there were negative correlations between IA and “extraversion”, “agreeableness”, “conscientiousness”, and “openness to experience”. This suggests that individuals with lower levels of these traits may be more susceptible to problematic Internet use. Similarly, in the Italian sample, we found a negative correlation between IA and “conscientiousness”. Conscientiousness, a personality trait associated with self-discipline, organization, goal-directed behavior, and a preference for planned over spontaneous activities (Costa & McCrae, 1992), appears to play a significant role in mitigating IA. Individuals with lower “conscientiousness” may struggle with impulsivity, lack of self-control, and difficulties in adhering to plans or schedules, which could manifest in excessive Internet use and impulsive online behaviors. These findings align with Andreassen et al. (2013) and Hwang et al. (2014), highlighting conscientiousness as a factor that mitigates the risk of developing IA.

The results from the Stepwise multiple linear regression analysis for the Italian sample indicate significant predictors collectively explaining 71.4% of the variance in symptoms related to IAT. BSMAS emerges as a robust predictor, suggesting that higher scores on the BSMAS are associated with increased symptoms of IA. Similarly, the IGDS proves to be a significant predictor, indicating a positive relationship between Internet gaming behavior and addiction symptoms. Moreover, the "lack of premeditation" dimension of UPPS contributes significantly to the prediction of IA symptoms, highlighting that individuals scoring higher on this dimension are more likely to exhibit symptoms of IA. Additionally, the "phone obsession" dimension of Phubbing makes a noteworthy contribution to the model, indicating that individuals exhibiting higher levels of phone obsession are at greater risk of developing symptoms of IA. Finally, the "goals" dimension of the DERS also contributes moderately yet significantly to the prediction model, underscoring the role of emotional regulation in the development of IA symptoms. Similarly, in the Spanish sample, a combination of five significant predictors collectively explains 68.6% of the variance in IA symptoms (IAT). The model highlights the BSMAS and the IGDS as substantial predictors. Furthermore, the "phone obsession" dimension of Phubbing emerges as a significant predictor, suggesting an association between phone-related behaviors and IA within the Spanish context. The analysis also reveals a positive association with the DERS, emphasizing the impact of emotional regulation difficulties

on IA. Additionally, the "lack of premeditation" dimension of the UPPS contributes significantly to the prediction model, indicating that individuals who score higher on this dimension are more likely to display symptoms of IA.

For the Ecuadorian and Peruvian samples, the analysis shows that the BSMAS and IGDS explain 66.7% and 77.5% of the variance in IAT scores, respectively. These findings suggest similar patterns in these two samples, confirming the role of SMA and IGD in predicting PUI.

Overall, distinct psychological variables emerged as significant predictors of problematic Internet use across the samples from Italy, Spain, Ecuador, and Peru. These findings underscore the importance of considering specific technological behaviors and psychological factors in understanding and addressing IA across different cultural contexts.

5.2. Conclusion, limitations and future research lines

In today's technologically driven world, understanding the subtleties of Internet usage and its impact on mental health is crucial. This research aimed to explore whether socio-cultural factors influence the development of PUI and to identify divergent risk and protective factors among Italian, Spanish, Ecuadorian, and Peruvian samples. The findings indicate significant differences in PUI across these cultural contexts, emphasizing the role of each country’s cultural norms, values, and technological infrastructure. These results highlight the necessity for culturally sensitive approaches when addressing PUI and developing targeted interventions.

While the study provides valuable insights, several limitations must be acknowledged:

1. The reliance on self-report measures, such as questionnaires, introduces the risk of social desirability bias, where participants might present themselves in a more favorable light rather than honestly reflecting their behaviors or attitudes.
2. Even with adaptations for linguistic and cultural differences, the study assumes measurement equivalence across cultures, which may affect the validity of comparisons. Variations in the interpretation of survey items might impact the accuracy of cross-cultural comparisons.

3. The study did not account for potential age-related differences in PUI, and the relatively narrow age range of participants may limit the generalizability of the findings to broader age groups.
4. The study may not fully capture the influence of regional, socio-economic, and urban-rural differences within countries, which could lead to an oversimplified representation of cultural factors affecting PUI.
5. The cross-sectional nature of the research restricts the ability to establish causality or determine the direction of relationships between variables. Longitudinal studies are needed to provide more robust evidence on causal pathways.
6. The findings may not be easily generalized to other cultural contexts or countries not included in the study. Socio-cultural, economic, and environmental factors should be considered in future research to enhance the applicability of the results.

To address these limitations future research should focus on:

1. Utilize objective and multi-method approaches alongside self-reports to enhance the accuracy and validity of data on PUI.
2. Implement longitudinal studies to explore the causal pathways and temporal dynamics of PUI, providing insights into how PUI evolves over time.
3. Include more diverse and representative samples to improve the external validity of findings and ensure broader applicability across different populations.
4. Investigate how age influences PUI to understand variations in Internet behaviors and their psychological impacts across different life stages.
5. Examine regional, socio-economic, and urban-rural differences within countries to capture a more nuanced view of how these factors affect PUI.
6. Conduct explicit cross-cultural comparisons to explore how different cultural contexts interact with individual psychological factors in shaping PUI. This will aid in developing more effective and culturally relevant prevention and intervention strategies.

By addressing these areas, future research can offer a more comprehensive and nuanced understanding of PUI, leading to more effective strategies for managing its negative impacts and supporting diverse populations in their Internet use.

Conclusion and practical implications

This doctoral thesis represents a comprehensive exploration into the intricate phenomenon of IA across diverse cultural contexts, encompassing Italy, Spain, Ecuador, and Peru. The strength of this research lies in its systematic investigation of psychological variables such as emotional dysregulation, FoMO, Phubbing, and personality traits, elucidating their respective roles and interrelationships in predicting IA. By employing rigorous methodologies and analyzing data from varied cultural settings, this study enhances our understanding of how socio-cultural factors influence Internet use patterns and addiction susceptibility.

One of the primary strengths of this thesis is its gender-specific analysis, which revealed distinct behavioral patterns and risk factors between males and females in relation to IA. This nuanced approach underscores the importance of tailoring interventions that account for gender differences and cultural contexts. Furthermore, the study's comparative analysis across multiple countries not only highlights commonalities in IA behaviors, such as the impact of social media use, but also reveals significant cultural variations that shape these behaviors. These findings underscore the need for culturally sensitive approaches in addressing IA and designing effective prevention and intervention strategies.

However, the research project is not immune to limitations. The reliance on self-report measures and convenience sampling methods may introduce biases, potentially affecting the generalizability of the findings. Moreover, the cross-sectional nature of most studies limits the ability to establish definitive causal relationships between variables. Future research endeavors should prioritize longitudinal designs to examine the temporal dynamics of IA and explore mediating factors such as personality traits, coping strategies, and social support networks.

A limitation inherent in this research is the use of correlational designs, which, while valuable for identifying relationships between variables, are limited by their inability to establish causality. A major issue with correlational designs is the potential for Type I errors (false positives), which can lead to erroneous conclusions about the relationships between variables. Interpreting the results in terms of causality is therefore challenging.

Another limitation of this research is the exclusive use of self-report measures, which may not capture the full complexity of IA and related psychological constructs. Future

studies could adopt mixed methodologies that incorporate cognitive tasks to evaluate the relationship between digital-era disorders and cognitive resources such as memory, attention, and perception. Such an approach would provide a more comprehensive understanding of the cognitive underpinnings of IA and its impact on individuals' mental processes.

Expanding the age range and including more diverse populations would provide a more holistic understanding of IA across different life stages and socio-economic backgrounds. Additionally, investigating the role of technological infrastructure, Internet accessibility, and regional disparities within countries could offer further insights into the cultural dimensions of IA. Such research avenues would facilitate the development of targeted interventions that address the specific needs of diverse populations affected by problematic Internet behaviors.

The findings of this research offer valuable insights that can significantly influence various aspects of addressing and managing IA. As we navigate the complexities of this global public health issue, it becomes clear that effective strategies must be multifaceted and context-specific. The research highlights several key areas where practical applications can make a meaningful impact.

- Targeted Interventions: The gender-specific findings highlight the necessity for tailored interventions. Programs and therapies addressing IA should consider gender differences in behavioral patterns and risk factors to be more effective.
- Culturally Sensitive Approaches: Given the cultural variations revealed by the study, interventions should be designed with cultural sensitivity in mind. Understanding the socio-cultural context can enhance the relevance and impact of prevention and treatment strategies.
- Policy Development: the insights gained from this research can inform policymakers in developing regulations and guidelines aimed at mitigating IA. This includes crafting policies that address the specific needs of different demographic groups and cultural contexts.
- Educational Programs: incorporating the study's findings into educational initiatives can help raise awareness about IA and its risks. Educational programs should address emotional dysregulation, FoMO, and Phubbing, as well as promote healthy Internet use practices.

- Technology Design: the role of technology in shaping IA patterns suggests that designers and developers should consider creating digital environments that promote balanced usage and reduce the risk of addiction.
- Support Systems: establishing and strengthening support systems, including counseling and community support groups, tailored to diverse cultural and demographic backgrounds can provide individuals with better resources for managing and overcoming IA.
- Family and Community Engagement: engaging families and communities in awareness and prevention efforts can help address IA at a more grassroots level. Support from family and community members can play a crucial role in managing and mitigating IA.

In conclusion, this thesis contributes significant insights into the multifaceted nature of IA, emphasizing the importance of context-specific approaches in combating this global public health concern. By addressing these limitations and pursuing future research directions, such as longitudinal studies and diverse population samples, we can better inform policies and interventions aimed at mitigating the adverse impacts of IA on individuals and societies.

Conclusioni e implicazioni pratiche

Questa tesi di dottorato rappresenta un'esplorazione completa del complesso fenomeno della IA in diversi contesti culturali, includendo Italia, Spagna, Ecuador e Perù. Il punto di forza di questa ricerca risiede nell'analisi sistematica di variabili psicologiche come la disregolazione emotiva, FoMO, Phubbing e i tratti della personalità, chiarendo i rispettivi ruoli e interrelazioni nel predire la IA. Attraverso l'uso di metodologie rigorose e l'analisi di dati provenienti da contesti culturali diversi, questo studio migliora la nostra comprensione di come i fattori socio-culturali influenzino i modelli di utilizzo di Internet e la suscettibilità alla dipendenza.

Uno dei principali punti di forza di questa tesi è l'analisi specifica per genere, che ha rivelato modelli comportamentali distinti e fattori di rischio tra uomini e donne in relazione alla IA. Questo approccio sfumato evidenzia l'importanza di interventi su misura che tengano conto delle differenze di genere e dei contesti culturali. Inoltre, l'analisi comparativa tra più paesi non solo mette in luce somiglianze nei comportamenti legati alla IA, come l'impatto dell'uso dei social media, ma rivela anche significative variazioni culturali che modellano questi comportamenti. Questi risultati sottolineano la necessità di approcci culturalmente sensibili nell'affrontare la IA e progettare strategie efficaci di prevenzione e intervento.

Tuttavia, lo studio non è esente da limitazioni. L'affidarsi a misure self-report e a metodi di campionamento di convenienza può introdurre bias, potenzialmente influenzando la generalizzabilità dei risultati. Inoltre, la natura trasversale della maggior parte degli studi limita la capacità di stabilire relazioni causali definitive tra le variabili. Le ricerche future dovrebbero prioritizzare disegni longitudinali per esaminare le dinamiche temporali della IA ed esplorare fattori mediatori come i tratti di personalità, le strategie di coping e le reti di supporto sociale.

Una limitazione intrinseca in questa ricerca è l'uso di disegni correlazionali che, sebbene siano utili per identificare relazioni tra variabili, non permettono di stabilire la causalità. Un problema importante con i disegni correlazionali è la possibilità di errori di Tipo I (falsi positivi), che possono portare a conclusioni errate sulle relazioni tra le variabili. Pertanto, interpretare i risultati in termini di causalità è difficile.

Un'ulteriore limitazione di questo progetto di ricerca è l'uso esclusivo di misure di autovalutazione, che potrebbero non catturare appieno la complessità dell'IA e dei

costrutti psicologici correlati. Studi futuri potrebbero adottare metodologie miste che includano task cognitivi per valutare la relazione tra i disturbi dell'era digitale e risorse cognitive come memoria, attenzione e percezione. Questo approccio fornirebbe una comprensione più completa delle basi cognitive dell'IA e del suo impatto sui processi mentali degli individui.

L'ampliamento della fascia di età e l'inclusione di popolazioni più diverse fornirebbero una comprensione più olistica della IA in diverse fasi della vita e contesti socio-economici. Inoltre, investigare il ruolo delle infrastrutture tecnologiche, dell'accessibilità a Internet e delle disparità regionali all'interno dei paesi potrebbe offrire ulteriori spunti sulle dimensioni culturali della IA. Questi percorsi di ricerca faciliterebbero lo sviluppo di interventi mirati che rispondano alle esigenze specifiche delle popolazioni diverse colpite da comportamenti problematici legati all'uso di Internet.

I risultati di questa ricerca offrono preziose intuizioni che possono influenzare significativamente vari aspetti dell'affrontare e gestire la IA. Mentre affrontiamo le complessità di questa problematica di salute pubblica globale, diventa evidente che strategie efficaci devono essere multifaccettate e specifiche per il contesto. La ricerca evidenzia diversi settori chiave dove le applicazioni pratiche possono avere un impatto significativo.

- **Interventi mirati**: I risultati specifici per genere evidenziano la necessità di interventi su misura. Programmi e terapie che affrontano la IA dovrebbero considerare le differenze di genere nei modelli comportamentali e nei fattori di rischio per essere più efficaci.
- **Approcci culturalmente sensibili**: Data la variazione culturale rivelata dallo studio, gli interventi dovrebbero essere progettati con sensibilità culturale. Comprendere il contesto socio-culturale può migliorare la rilevanza e l'impatto delle strategie di prevenzione e trattamento.
- **Sviluppo di politiche**: Le intuizioni ottenute da questa ricerca possono informare i decisori politici nello sviluppo di regolamenti e linee guida per mitigare la dipendenza da Internet. Questo include la creazione di politiche che affrontino le esigenze specifiche di diversi gruppi demografici e contesti culturali.
- **Programmi educativi**: Incorporare i risultati dello studio nelle iniziative educative può aiutare a sensibilizzare riguardo ai rischi della IA. I programmi

educativi dovrebbero affrontare la disregolazione emotiva, FoMO e Phubbing, oltre a promuovere pratiche di utilizzo di Internet più salutari.

- **Progettazione tecnologica**: Il ruolo della tecnologia nel modellare i modelli di IA suggerisce che i progettisti e gli sviluppatori dovrebbero considerare la creazione di ambienti digitali che promuovano un uso equilibrato e riducano il rischio di dipendenza.
- **Sistemi di supporto**: Stabilire e rafforzare i sistemi di supporto, inclusi consulenza e gruppi di supporto comunitari, adattati a contesti culturali e demografici diversi può fornire alle persone risorse migliori per gestire e superare la IA.
- **Coinvolgimento familiare e comunitario**: Coinvolgere famiglie e comunità negli sforzi di sensibilizzazione e prevenzione può aiutare ad affrontare la IA a un livello più di base. Il supporto di familiari e membri della comunità può svolgere un ruolo cruciale nella gestione e mitigazione della dipendenza da Internet.

In conclusione, questa tesi contribuisce con significativi approfondimenti sulla natura sfaccettata della IA, enfatizzando l'importanza di approcci specifici per il contesto nel combattere questa preoccupazione globale per la salute pubblica. Affrontando queste limitazioni e perseguendo future direzioni di ricerca, come studi longitudinali e campioni di popolazioni diversificate, possiamo meglio informare politiche e interventi volti a mitigare gli impatti negativi della IA su individui e società.

Conclusiones e implicaciones practicas

Esta tesis doctoral representa una exploración exhaustiva del complejo fenómeno de la IA en diversos contextos culturales, abarcando Italia, España, Ecuador y Perú. La fortaleza de esta investigación radica en su análisis sistemático de variables psicológicas como la desregulación emocional, FoMO, Phubbing y los rasgos de personalidad, aclarando sus respectivos roles e interrelaciones en la predicción de la IA. Al emplear metodologías rigurosas y analizar datos de diversos entornos culturales, este estudio mejora nuestra comprensión de cómo los factores socioculturales influyen en los patrones de uso de Internet y la susceptibilidad a la adicción.

Una de las principales fortalezas de esta tesis es su análisis específico de género, que reveló patrones de comportamiento y factores de riesgo distintos entre hombres y mujeres en relación con la IA. Este enfoque matizado subraya la importancia de adaptar las intervenciones teniendo en cuenta las diferencias de género y los contextos culturales. Además, el análisis comparativo entre varios países no solo destaca las similitudes en los comportamientos relacionados con la IA, como el impacto del uso de redes sociales, sino que también revela variaciones culturales significativas que modelan estos comportamientos. Estos hallazgos resaltan la necesidad de enfoques culturalmente sensibles para abordar la IA y diseñar estrategias de prevención e intervención eficaces.

Sin embargo, el estudio no está exento de limitaciones. La dependencia de medidas autoinformadas y métodos de muestreo por conveniencia puede introducir sesgos, lo que podría afectar la generalización de los hallazgos. Además, la naturaleza transversal de la mayoría de los estudios limita la capacidad de establecer relaciones causales definitivas entre las variables. Las investigaciones futuras deberían priorizar diseños longitudinales para examinar las dinámicas temporales de la IA y explorar factores mediadores como los rasgos de personalidad, las estrategias de afrontamiento y las redes de apoyo social.

Una limitación inherente en esta investigación es el uso de diseños correlacionales, que, aunque valiosos para identificar relaciones entre variables, tienen la limitación de no poder establecer causalidad. Un problema importante con los diseños correlacionales es el potencial de errores Tipo I (falsos positivos), lo que puede llevar a conclusiones erróneas sobre las relaciones entre las variables. Interpretar los resultados en términos de causalidad, por lo tanto, resulta complicado.

Otra limitación de esta investigación es el uso exclusivo de medidas de autoevaluación, que podrían no captar completamente la complejidad de la IA y los constructos psicológicos relacionados. Estudios futuros podrían adoptar metodologías mixtas que incluyan tareas cognitivas para evaluar la relación entre los trastornos de la era digital y los recursos cognitivos, como la memoria, la atención y la percepción. Este enfoque proporcionaría una comprensión más completa de las bases cognitivas de la IA y su impacto en los procesos mentales de los individuos.

Ampliar el rango de edad e incluir poblaciones más diversas proporcionaría una comprensión más holística de la IA en diferentes etapas de la vida y contextos socioeconómicos. Además, investigar el papel de la infraestructura tecnológica, la accesibilidad a Internet y las disparidades regionales dentro de los países podría ofrecer más información sobre las dimensiones culturales de la IA. Estas vías de investigación facilitarían el desarrollo de intervenciones dirigidas que respondan a las necesidades específicas de diversas poblaciones afectadas por comportamientos problemáticos relacionados con el uso de Internet.

Los hallazgos de esta investigación ofrecen valiosas perspectivas que pueden influir significativamente en varios aspectos del abordaje y gestión de la IA. A medida que enfrentamos las complejidades de este problema global de salud pública, se hace evidente que las estrategias efectivas deben ser multifacéticas y específicas para cada contexto. La investigación destaca varias áreas clave donde las aplicaciones prácticas pueden tener un impacto significativo.

- **Intervenciones dirigidas**: Los hallazgos específicos de género resaltan la necesidad de intervenciones personalizadas. Los programas y terapias que abordan la IA deben considerar las diferencias de género en los patrones de comportamiento y factores de riesgo para ser más efectivos.
- **Enfoques culturalmente sensibles**: Dada la variación cultural revelada por el estudio, las intervenciones deben diseñarse con sensibilidad cultural. Comprender el contexto sociocultural puede mejorar la relevancia y el impacto de las estrategias de prevención y tratamiento.
- **Desarrollo de políticas**: Las ideas obtenidas de esta investigación pueden informar a los responsables políticos en el desarrollo de reglamentos y directrices

para mitigar la adicción a Internet. Esto incluye crear políticas que aborden las necesidades específicas de diferentes grupos demográficos y contextos culturales.

- **Programas educativos**: Incorporar los hallazgos del estudio en iniciativas educativas puede ayudar a crear conciencia sobre los riesgos de la IA. Los programas educativos deben abordar la desregulación emocional, FoMO y Phubbing, y promover un uso saludable de Internet.
- **Diseño tecnológico**: El rol de la tecnología en los patrones de IA sugiere que los diseñadores deberían considerar entornos digitales que fomenten un uso equilibrado y reduzcan el riesgo de adicción.
- **Sistemas de apoyo**: Establecer sistemas de apoyo, como la asesoría y los grupos comunitarios, adaptados a diversos contextos culturales y demográficos, puede proporcionar mejores recursos para manejar y superar la IA.
- **Participación familiar y comunitaria**: Involucrar a las familias y comunidades en los esfuerzos de sensibilización y prevención puede ayudar a enfrentar la IA a nivel local. El apoyo de los familiares y la comunidad puede desempeñar un papel crucial en la gestión y mitigación de la adicción a Internet.

En conclusión, esta tesis ofrece valiosas perspectivas sobre la naturaleza multifacética de la IA, destacando la importancia de enfoques específicos del contexto para combatir este problema de salud pública global. Al abordar estas limitaciones y continuar con investigaciones futuras, como estudios longitudinales y muestras de poblaciones diversas, podremos informar mejor las políticas e intervenciones destinadas a mitigar los impactos adversos de la IA en los individuos y las sociedades.

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Annex

Annex 1: *Informed consent (Spanish version)*

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Via dei Marsi 78, 00185 Roma

Departament de Psicologia Bàsica
Facultat de Psicologia, Universitat de València
Avgda. Blasco Ibañez, 21 46010-València

Responsables del proyecto de Investigación: Anna Maria Giannini, Manuel Martí-Vilar

Dirección: Laboratorio di Psicologia Sperimentale Applicata, Tel. 06.49917534, Mail: info@labpsicoapplicata.it; Departament de Psicologia Bàsica Facultat de Psicologia Universitat de València (Manuel.Marti-Vilar@uv.es; telefono n. +34 963864523)

Formulario de consentimiento informado para participar en el estudio titulado:

"Las adicciones tecnológicas: la influencia de las emociones y aspectos de la personalidad en los nuevos trastornos de la era digital".

Antes de decidir libremente si desea participar en este estudio, LEA DETENIDAMENTE este consentimiento informado y le recordamos que, en caso de que necesite aclaraciones sobre cualquier aspecto del procedimiento experimental, los Responsables de la investigación, Profesora Anna Maria Giannini y Prof. Manuel Martí-Vilar y sus colaboradores están a su entera disposición.

Recuerde que se trata de un proyecto de investigación y que su participación es totalmente voluntaria. Podrá retirarse en cualquier momento.

Es muy importante para la investigación que usted responda a todas las preguntas de los cuestionarios, con atención y sinceridad, siguiendo las instrucciones que se le den.

OBJETIVO DE LA INVESTIGACIÓN

El objetivo del estudio es ofrecer un marco de actitudes y comportamientos relacionados con el uso de Internet

INSTRUMENTOS UTILIZADOS: Cuestionario online

La duración del estudio serà de unos 20 minutos

RIESGOS, MOLESTIAS Y EFECTOS SECUNDARIOS

El objetivo de esta investigación es de carácter científico y no se prevé ninguna ventaja inmediata para su participación; sin embargo, su contribución puede ser de gran ayuda para aumentar los conocimientos y el bagaje de información sobre el tema en cuestión. Las conclusiones de la investigación serán muy útiles y constituirán una base importante para la comunidad científica.

La participación en el experimento no implica riesgos significativos para la salud. Sin embargo, la administración de cuestionarios, debido al hecho de centrarse en sus emociones y/o características psicológicas, puede resultar un poco incómoda.

Toda la información personal y los datos recogidos se almacenarán en forma encriptada en servidores protegidos por contraseña y accesibles sólo a los investigadores que realizan el estudio; por último, los resultados del estudio se publicarán únicamente de forma agregada y anónima.

Le recordamos que puede solicitar en cualquier momento interrumpir el procedimiento experimental.

OTRAS INFORMACIONES ÚTILES

Confidencialidad. Los datos recogidos serán tratados según lo dispuesto por la Informativa sobre el tratamiento de los datos personales según el Decreto Legislativo 30 junio 2003 n. 196 "Código en materia de protección de los datos personales", garantizando el anonimato de los participantes y según el art. 13 del Reglamento 2016/679 de la UE (GDPR). De conformidad con el art. 9 del Código Deontológico de los Psicólogos italianos, está garantizado su derecho a la confidencialidad, a la no reconocibilidad y al anonimato.

Por tanto, los datos recogidos se presentarán y difundirán en centros científicos u otros lugares de forma estrictamente anónima.

Le recordamos que, en caso de que necesite aclaraciones sobre cualquier aspecto del procedimiento experimental, la Profesora Anna Maria Giannini (info@labpsicoaplicada.it; - telefono n. 0649917534) y el Professor Manuel Martí-Vilar (Manuel.Marti-Vilar@uv.es; telefono n. +34 963864523) están a su disposición.

Declara:

- haber leído atentamente las explicaciones relativas a este estudio y a todo el procedimiento experimental;

- haber sido informado/con respecto a los fines y objetivos de la investigación de que se trate;

- tener conocimiento de las molestias del experimento;

- haber recibido garantías satisfactorias sobre la confidencialidad de la información obtenida del examen de su persona;

- ser consciente de que puede retirarse en cualquier fase del estudio;

- que ha dado su consentimiento a la participación en este estudio;

- ser consciente de que, de conformidad con la legislación vigente, mis datos personales se utilizarán exclusivamente para fines de investigación científica.

¿Aceptas participar?

Annex 2: *Informed consent (Italian version)*

Dipartimento di Psicologia
Università di Roma "La Sapienza"
Via dei Marsi 78, 00185 Roma

Departament de Psicologia Bàsica
Facultat de Psicologia, Universitat de València
Avgda. Blasco Ibañez, 21 46010-València
(9638) 64523

Responsabili del progetto di Ricerca: Anna Maria Giannini, Manuel Martí-Vilar

Recapito: Laboratorio di Psicologia Sperimentale Applicata, Tel. 06.49917534, Mail: info@labpsicoapplicata.it; Departament de Psicologia Bàsica Facultat de Psicologia Universitat de València (Manuel.Marti-Vilar@uv.es; telefono n. +34 963864523)

Modulo di consenso informato per la partecipazione allo studio dal titolo:

"Le dipendenze tecnologiche: l'influenza delle emozioni e di aspetti della personalità sui nuovi disturbi dell'era digitale"."

Prima di decidere liberamente se vuole partecipare a questo studio, LEGGA ATTENTAMENTE questo consenso informato e Le ricordiamo che, in caso lei abbia bisogno di delucidazioni su qualunque aspetto della procedura sperimentale, i Responsabili della ricerca, Prof.ssa Anna Maria Giannini e Prof. Manuel Martí-Vilar e i loro collaboratori, sono a Sua completa disposizione.
La preghiamo di ricordare che questo è un progetto di ricerca e che la sua partecipazione è completamente volontaria. Lei si potrà ritirare in qualunque momento.

SCOPO DELLO STUDIO

L'obiettivo dello studio è di fornire un quadro di atteggiamenti e comportamenti legati alle modalità di utilizzo di Internet e di piattaforme e strumenti digitali quali smartphone e social network. Nello specifico ci si propone di approfondire il possibile sviluppo di nuovi disturbi tipici dell'era digitale, come l'Internet Addiction, l'Internet Gaming Addiction, la Social Media Addiction, la Fear of Missing Out (FOMO), e il Phubbing. Analizzare il tipo di relazione che può esistere tra tali costrutti e le caratteristiche disposizionali di personalità, la capacità di regolare e riconoscere le proprie emozioni e di comportamento prosociale degli individui.
Inoltre, si analizzeranno le possibili differenze in base alle variabili sociodemografiche degli utenti (sesso, età, situazione sentimentale, livello socioculturale), alla frequenza di utilizzo di tali piattaforme

STRUMENTI UTILIZZATI

Nello studio, Lei dovrà compilare alcuni questionari, tramite piattaforma online.

Questionari:

- Questionario **anagrafico e su abitudini quotidiane**.
- **Internet Addiction Test (IAT, Young, 1998)** nella versione italiana di Fioravanti & Casale, (2015)**:** Questionario per valutare la misura in cui l'uso di Internet influenza la vita quotidiana, la vita sociale, la produttività, il sonno e i sentimenti dell'individuo
- **Internet Gaming Disorder Scale–Short Form (IGDS9-SF, Pontes & Griffiths, 2015)** nella versione italiana di Monacis et al. (2016)**:** per valutare la frequenza e i potenziali effetti dannosi delle attività di gioco online e/o offline che si verificano in un periodo di 12 mesi.
- **Bergen Social Media Addiction Scale (BSMAS, Andreassen, Billieux, et al., 2016)** nella versione italiana di Monacis et al. (2017)**:** Questionario per valutare le esperienze nell'uso dei social media nell'ultimo anno. attraverso 6 item riconducibili ad elementi di base della dipendenza (Griffiths, 2005).
- **Social Media Engagement Scale (SMES, Przybylski, 2013)** per quantificare la misura in cui, durante gli ultimi sette giorni, i partecipanti abbiano utilizzato i social network durante le loro attività quotidiane
- **Phubbing Scale (Karadag et al, 2015)** nella versione italiana di Guazzini et al. (2018), per misurare la tendenza degli individui a snobbare qualcuno in un ambiente sociale concentrandosi sul proprio telefono invece di parlare direttamente con la persona vicina;
- **Fear of Missing Out Scale (FoMOS Przybylski, 2013)** nella versione italiana di Casale & Fioravanti (2020): per Indagare il livello di paura che le persone hanno di non prendere parte a qualche esperienza gratificante
- **Prosocialness Scale for Adults (Caprara et al., 2005)** per misurare la tendenza a mettere in atto comportamenti prosociali e discriminare tra individui più o meno prosociali;
- **Difficulties in Emotion Regulation Scale (DERS, Gratz & Roemer, 2004),** nella versione italiana di Lausi et al., (2020): questionario per valutare le valuta i livelli tipici di disregolazione emotiva degli individui.
- **BFI-15 (Dominguez-Lara & Merino-Soto, 2018a)** misurare i tratti di personalità degli individui basandosi sul modello dei Big Five;
- **UPPS-P impulsivity scale (Billieux et al., 2012) – Versione italiana (D'Orta et al., 2015):** che misura cinque tratti di impulsività

PROCEDURA SPERIMENTALE

I questionari e i compiti saranno somministrati in forma "self-report" tramite la piattaforma online "Qualtrics". La durata dello studio sarà di circa 20 minuti. Può utilizzare qualunque tipo di *device* informatico per la compilazione.
Ai fini della ricerca è molto importante che lei risponda a tutte le domande dei questionari, con attenzione e sincerità, seguendo le istruzioni che le verranno date.

RISCHI, DISAGI ED EFFETTI COLLATERALI

L'obiettivo della presente ricerca è di natura scientifica e non è previsto alcun immediato vantaggio per la sua partecipazione; tuttavia, il suo contributo potrà essere di grande aiuto per aumentare le conoscenze e il bagaglio di informazioni relative all'argomento in questione. Le indicazioni che

deriveranno dalla ricerca saranno molto utili e costituiranno una base importante da mettere a disposizione per la comunità scientifica.
La partecipazione all'esperimento non implica rischi significativi per la salute. Tuttavia, la somministrazione dei questionari, per il fatto di focalizzarsi sulle proprie emozioni e/o caratteristiche psicologiche, può comportare un lieve disagio.
Tutte le informazioni personali e i dati raccolti saranno archiviati in forma criptata su server protetti da password e accessibili solo ai ricercatori che conducono lo studio; infine, i risultati dello studio saranno pubblicati soltanto in forma aggregata e anonima.
Le ricordiamo che può chiedere in qualsiasi momento di interrompere la procedura sperimentale.

ALTRE INFORMAZIONI UTILI

Riservatezza. I dati raccolti saranno trattati secondo quanto disposto dall'Informativa sul trattamento dei dati personali ai sensi del Decreto Legislativo 30 giugno 2003 n. 196 "Codice in materia di protezione dei dati personali", garantendo l'anonimato dei partecipanti e ai sensi dell'art. 13 del Regolamento UE 2016/679 (GDPR). Ai sensi dell'art. 9 del Codice Deontologico degli Psicologi italiani, è garantito il Suo diritto alla riservatezza, alla non riconoscibilità ed all'anonimato.
I dati raccolti saranno, quindi, presentati e diffusi in sedi scientifiche od altre sedi in forma rigorosamente anonima.
Le ricordiamo che in caso lei abbia bisogno di delucidazioni su qualunque aspetto della procedura sperimentale la Prof.ssa Anna Maria Giannini (info@labpsicoapplicata.it; - telefono n. 0649917534) e il Prof. Manuel Martí-Vilar (manuel.marti-vilar@uv.es; telefono n. +34 963864523) sono a Sua disposizione.

Dichiara:

- di aver letto attentamente le spiegazioni relative a questo studio e l'intera procedura sperimentale;
- di essere stato informato/a riguardo alle finalità e agli obiettivi della ricerca in questione;
- di essere a conoscenza dei disagi dell'esperimento;
- di aver ricevuto soddisfacenti assicurazioni sulla riservatezza delle informazioni ottenute dall'esame della propria persona;
- di essere consapevole di potersi ritirare in qualsiasi fase dello studio;
- di aver liberamente dato il consenso alla partecipazione a questo studio;
- di essere consapevole che secondo il rispetto della normativa vigente i miei dati personali saranno utilizzati esclusivamente per scopi di ricerca scientifica.

Acconsente a partecipare alla ricerca?

Annex 3: *Approval by the research ethics committee*

Prot. n. 0002193 del 18/12/2020 - [UOR: SI000030 - Classif. II/23]

UNIVERSITÀ DEGLI STUDI DI ROMA
"La Sapienza"
DIPARTIMENTO DI PSICOLOGIA
COMITATO ETICO

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Institutional Review Board
Dipartimento di Psicologia

In data 17/12/2020, l'Institutional Review Board del Dipartimento di Psicologia si è riunito per valutare il progetto di ricerca di cui sono Responsabili la Prof.ssa Anna Maria Giannini e il Prof. Manuel Martí-Vilar su "Le dipendenze tecnologiche: l'influenza delle emozioni e di aspetti della personalità sui nuovi disturbi dell'era digitale".

Il Comitato ha espresso parere favorevole nei riguardi del progetto.

Roma, 17/12/2020

Il presidente
Prof. Anna Maria Giannini