Psychological risk factors for problematic social network use: An overview of systematic reviews and *meta*-analyses☆

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ABSTRACT

Problematic Social Network Use (PSNU) is a widespread and harmful public health issue. Therefore, it is unsurprising that the literature has focused on identifying possible risk factors contributing to this behavior. However, most identified factors were found to be shared with other problematic online behaviors. Therefore, the present overview aims to identify the psychological risk factors consistently associated with PSNU and evaluate whether the emerging risk factors were shared across Internet Gaming Disorder, Problematic Pornography Use, and Compulsive Online Shopping. A systematic search of four databases was conducted to identify systematic reviews/*meta*-analyses investigating the relationship between PSNU and psychological risk factors. Then, a bibliometric analysis was performed to examine whether the identified factors were shared across other problematic online behaviors. Thirty-five systematic reviews/*meta*-analyses were included, examining general and behavior-specific predisposing factors. General predisposing factors associated with PSNU included insecure attachment, high neuroticism, low conscientiousness, low self-esteem, depression, anxiety, stress, social anxiety, loneliness, and fear of missing out. Behavior-specific factors, though less frequently studied, highlighted the role of unmet psychological needs, Preference for Online Social Interaction, and motives related to emotion regulation and socialization. The bibliometric analysis revealed that many risk factors for PSNSU are shared with other problematic online behaviors. However, certain specificities emerged, including distinct motivations driving these behaviors. Findings suggest that PSNU shares a spectrum of risk factors with other problematic online behaviors, yet specific etiological and motivational differences remain. Overall, the findings underscore integrating shared and specific risk factors to improve tailored prevention and intervention strategies.

1. Introduction

Although social networks (SNs) offer numerous benefits and opportunities, their rapid and widespread expansion has sparked a debate among clinicians regarding the potential for problematic use, as some patterns of excessive engagement appear to resemble behaviors associated with substance use disorders (e.g., Andreassen, 2015). In 2015, the World Health Organization (WHO) expressed concern about the impact of excessive social media use on public health (WHO, 2015), and a recent global review on digital addiction prevalence estimated that 17.42 % of individuals exhibit problematic patterns of SNs use (Meng et al., 2022).

Problematic Social Network Use (PSNU) involves a loss of control over social network usage, with an increasing focus on SNs and continued use despite the negative impacts on daily life (Andreassen, 2015). Individuals who develop PSNU become excessively preoccupied with SNs, driven by a strong motivation to use these platforms. They invest significant time and effort into SNs to the point that this interferes with other social activities, education, work, relationships, and/or mental health and well-being (Andreassen, 2015).

Some researchers have proposed that PSNU might fit into the ICD-11 (WHO, 2022) category of "other specified disorder due to addictive behaviors" (Brand et al., 2020) based on evidence showing i) significant distress and functional impairment in daily life caused by the behavior, ii) the relevance of the addiction model in explaining PSNU, and iii) the involvement of similar mechanisms to those found in other addictive behaviors. However, PSNU has not yet been officially classified as a mental disorder by international diagnostic systems, and some scholars

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suggest it might be a temporary coping mechanism in response to transient negative emotions (Casale, 2020). Therefore, we will use the term "Problematic Social Network Use" instead of labelling it as a disorder, as this classification seems premature within the current research.

Given the widespread impact and high prevalence of PSNU, there has been considerable interest in identifying the factors contributing to this behavior over the past three decades. Recent *meta*-analyses have identified several personality traits linked to PSNU, including neuroticism, low conscientiousness (Akbari et al., 2023), low self-esteem (Saiphoo et al., 2020), and narcissism (Casale & Banchi, 2020). Additional *meta*-analyses (Huang, 2020; Marino, Gini, Vieno, & Spada, 2018b; Shannon et al., 2022) have found that negative emotions such as anxiety, stress, and depression are significant predictors of problematic social media use.

Actually, these psychological factors have consistently been associated with various problematic online behaviors, like Internet Gaming Disorder (IGD) and problematic pornography use (e.g., Marciano et al., 2020; Vieira & Griffiths, 2024). However, some specific risk factors for PSNU (not shared across the various types of problematic online behaviors) have emerged. For example, Preference for Online Social Interaction (POSI) – a "cognitive individual difference construct characterized by beliefs that one is safer, more efficacious, more confident, and more comfortable with online interpersonal interactions and relationships than with traditional face-to-face social activities'' (Caplan, 2003, p. 629) – was found to predict PSNU (e.g. Pontes et al., 2018). However, POSI was also found to play an important role in predicting negative outcomes from problematic online game use (Haagsma et al., 2012) and to be a significant mediator in the relationship between social anxiety and IGD (Marino et al., 2020).

The Interaction of Person-Affect-Cognition-Execution (I-PACE) model of addictive behaviors (Brand et al., 2019) differentiates between generic predisposing variables (for example, depression, anxiety, impulsivity), which have been considered as being involved in different types of addictive behaviors (e.g., gambling disorder, gaming disorder, buying-shopping disorder) from behavior-specific predisposing variables that are considered characteristic for the different specific addictive behaviors (for example, materialism for online-shopping). Furthermore, Wegmann and Brand (2019) identified some psychosocial characteristics (for example, social anxiety, loneliness, need to belong) as potential risk factors linked to PSNU specifically.

The existence of common risk factors supports the hypothesis of a spectrum of related yet relatively distinct problematic online behaviors (Billieux, 2012; Starcevic & Billieux, 2017). The "Spectrum hypothesis" has been tested in different studies (e.g., Baggio et al., 2022, 2024; Rozgonjuk et al., 2023), showing that the various problematic online behaviors considered (online gaming, gambling, shopping, sexual activities, and social networking) reflect distinct constructs with strong relationships between symptoms of the same problematic online behavior and a moderate strength of relationships between symptoms of different problematic online behaviors. However, much work remains to be done to understand better the unique characteristics of problematic online behaviors (e.g., specific etiological and risk/protective factors) and their similarities.

Research on shared and specific risk factors across various problematic online behaviors is crucial for improving their conceptualization and developing effective prevention strategies.

Given these premises, we conducted an overview of systematic reviews/*meta*-analyses to (i) identify the psychological risk factors consistently associated with PSNU, (ii) evaluate whether the emerging risk factors for PSNU were also found to be associated with other problematic online behaviors (i.e., Internet Gaming Disorder, problematic pornography use, and compulsive online shopping).

Conducting an overview of systematic reviews permits further consolidating and integrating the evidence from multiple systematic reviews, providing a higher-level summary of the state of knowledge on a given issue. This is particularly useful in complex or rapidly evolving research fields, like problematic online behaviors.

2. Methods

This systematic overview followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines provided by Page et al. (2021).

2.1. Eligibility criteria

Studies were eligible for inclusion if they met all the following criteria: (a) Written in English, (b) Systematic review/*meta*-analysis, (c) Published in peer-reviewed journals, (d) Investigating the relationship between PSNU and psychological risk factors. Narrative overviews, theoretical reviews, or other non-systematic reviews were excluded at this research stage. In addition, reference lists of all systematic reviews and *meta*-analyses identified during the screening process were screened for additional articles.

2.2. Information sources and search strategy

To identify eligible studies, a systematic search strategy was performed in MedLine, ScienceDirect, Web of Science and Scopus using the following search string: *("review" OR "meta-analysis") AND ("social media" OR "social network*"OR "Generalized Problematic Internet Use" OR "facebook" OR "twitter" OR "instagram" OR "snapchat" OR "tiktok") AND ("problematic" OR "addic*" OR "depend*" OR "abuse" OR "compulsiv*" OR "excessiv*")*.

Subsequently, to investigate if the extracted factors were shared across other problematic online behaviors, a new bibliometric analysis was performed. For doing so, three problematic online behaviors were selected: Internet Gaming Disorder (IGD), Problematic Pornography Use (PPU) and Compulsive Online Shopping (COS). For each risk factor identified for PSNU, systematic searches were conducted to retrieve published systematic reviews or *meta*-analyses related to it in the context of the other problematic online behaviors considered using the following search strategy: *"("name risk factor") AND ("Meta-analysis" OR "Systematic Review") AND ("Name of the problematic online behaviors or synonymous")*. If no systematic reviews or *meta*-analyses were found, the keywords *"Meta-analysis" OR "Systematic Review"* were removed to explore if there was at least some preliminary evidence on the topic. Additional searches for primary studies should be considered when gaps within systematic review evidence are identified (Pieper et al., 2014).

The search was conducted in August 2024.

2.3. Selection process

The search strategy was implemented in each database, and duplicate articles (i.e., those identified in multiple databases) were eliminated. Then, the titles and abstracts of the records were double-screened. Title and abstract screening was conducted independently by two authors (S.B.B. and S.G.; conflicts solved by a third author: G.F). Articles considered ineligible by both reviewers were excluded. For the remaining articles, full texts were screened. A backward search (i.e., carefully checking references cited in eligible records) was conducted to identify other systematic reviews and/or *meta*-analyses that did not emerge in the primary search.

2.4. Data extraction and quality assessment

Two authors (S.B.B. and S.G.) worked independently for data extraction, and conflicts were solved by a third author (G.F). For each study included, the study design and number of studies included, the population and sample size, the risk factors for PSNU examined, the main findings and the quality of evidence were extracted. Two authors independently assessed the quality of the included reviews using the

AMSTAR (a measurement tool to assess systematic reviews) checklist (Shea et al., 2007).

2.5. Synthesis method

The risk factors identified during data extraction were grouped inspiring by the I-PACE model of specific Internet-use disorders (Brand et al., 2016, 2019; Brandtner et al., 2021) since it provides a theoretical framework to systematize the processes underlying the development and maintenance of addictive use of certain Internet applications. In particular, we focused on the P-component of the I-PACE model, which represents a person's core characteristics likely involved in the addiction process as predisposing variables. General predisposing variables (e.g., negative early childhood experiences, personality traits, psychopathology, general coping style, psychosocial characteristics) are differentiated from behavior-specific predisposing variables (e.g., specific motives, needs, and values) (Brand et al., 2019). Also, some of the variables included in the C-component of the model were considered since it comprises the personal core cognitions resulting in the decision to use the Internet application (e.g., Internet-related cognitions, metacognitions).

3. Results

The study flowchart is presented in Fig. 1. Of the 3,874 records identified through database search, 2,772 full-text articles were retrieved after removing duplicates. Among these, 513 papers fulfilled the inclusion criteria and were assessed for eligibility. After full-text screening, 35 systematic reviews/*meta*-analyses on psychological risk factors for PSNU were included in the qualitative synthesis.

3.1. Psychological risk factors for PSNU

We included 14 systematic reviews and 21 *meta*-analyses. Characteristics and the AMSTAR score of the 35 included studies are reported in Table 1. Based on AMSTAR evaluation of methodological quality, 14 systematic reviews/*meta*-analyses (40 %) were rated as high quality, 20 (57.1 %) were rated as moderate quality, and one (2.9 %) was rated as low quality. Complete scores for each article and each item are available in the online supplemental appendix (Table S1). Publication years ranged from 2018 to 2024 (the year of data extraction). Regarding the geographical focus of systematic reviews, most of the included studies had a global focus or no specified geographical limitations and, therefore, included studies published anywhere in the world.

Regarding specific populations of interest, most of the systematic reviews/*meta*-analyses focused on adolescents, young adults, and adults. Only one systematic review included children. Regarding study designs, most of the systematic reviews/*meta*-analyses included cross-sectional studies.

Because one systematic review/*meta*-analysis could investigate more than one risk factor for PSNU, the frequency counts for each category of risk factors could exceed the number of studies included in this overview.

3.1.1. General predisposing variables for PSNU

Regarding negative childhood experiences, we found seven systematic reviews /*meta*-analyses evidencing a positive relationship between PSNU and (i) Childhood trauma (n = 1) (ii) Negative parent–child relationships/negative family climate and negative parenting (i.e., parenting characterized by inconsistency, rejection, overprotection, harsh parenting, and psychological control; n = 2), (iii) insecure attachment (n = 4).

We found 11 systematic reviews /*meta*-analyses targeted more than one personality trait supporting an association between PSNU and (i) high Neuroticism (n = 6), (ii) low Conscientiousness (n = 5), (iii) low Agreeableness (n = 5), (iv) low Openness (n = 5) (v) impulsivity (n = 1), (vi) shyness (n = 1), (vii) vulnerable and grandiose narcissism (n = 2), and (viii) boredom proneness (n = 1). Low self-esteem was found to be associated with PSNU by three systematic reviews/*meta*-analyses.

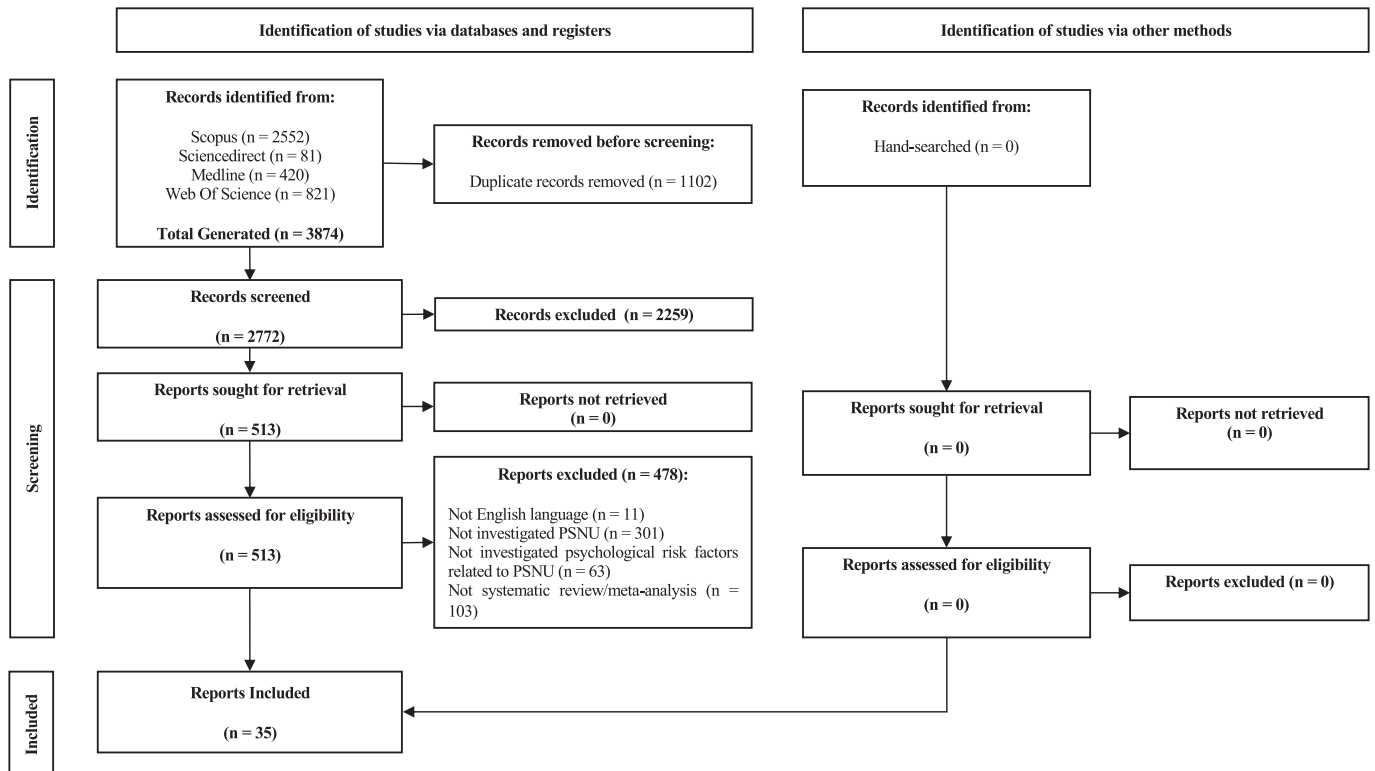Regarding psychopathology, we found 12 publications that

Fig. 1. PRISMA flowchart depicting the study selection process.

Table 1

Characteristics and the AMSTAR score of the included studies.

Authors (year)	Number of studies included and studies' design	Population and sample size	Risk factors examined	Main findings	Quality of evidence	AMSTAR score (0–11)
Abbouyi et al., 2024	Systematic review of 15 studies (one longitudinal and 14 cross-sectional) from six countries of the MENA region.	N = 12,252 adolescents and adults	(i) anxiety (k = 13, n = 11113);(ii) depression (k = 13, n = 11366)	Significant associations between problematic social media use and both anxiety (0.167 < r < 0.385) and depressive symptoms (0.129 < r < 0.45) were observed.	The quality of the included studies was determined using the National Institute of Health Quality Assessment Tool for Observational Cohort and Cross-sectional Studies. Most studies were of fair quality.	8
Akbari et al., 2023	Meta-analysis of 78 cross-sectional studies from 35 countries.	N = 39930 adolescents and adults	(i) High neuroticism (k = 41; n = 22142)(ii) Low Agreeableness (k = 36; n = 19780)(iii) Low Openness to Experiences (k = 33, n = 19175)(iv) Low Conscientiousness (k = 36; n = 19780)(v) High Extraversion (k = 39; n = 21185).	Neuroticism (r = 0.17), agreeableness (r = −0.06), openness (r = −0.06), and conscientiousness (r = −0.15) were significantly associated with problematic Facebook use. Extraversion resulted not significantly correlated (r = −0.05).	Funnel plot, egger's regression test and trill and fill methods were used indicating low risk of publication bias	7
Alimoradi et al., 2024	Meta-analysis of 85 cross-sectional studies from 23 countries.	N = 104425 adolescents and adults	(i) loneliness (k = 4, n = 6285);(ii) depression (k = 11, n = 10714);(iii) anxiety (k = 12, n = 15420);(iv) stress (k = 8, n = 2220).	Social media addiction was significantly associated with loneliness (Fisher's Z score of 0.19), depression (Fisher's Z score of 0.36), anxiety (Fisher's Z score of 0.37), and stress (Fisher's Z score of 0.38).	The Newcastle Ottawa Scale (NOS) for cross-sectional studies was used to assess the risk of bias. Most studies (75 out of 85) were categorized as being of high quality (or low risk of bias).	9
Camerini et al., 2023	Systematic review and *meta*-analysis) of 59 studies (52 cross-sectional, four longitudinal, and three included Ecological Momentary Assessments) from 15 countries.	N = 50887 adolescents and adults	Boredom Proneness (k = 4, n=NR)	Results showed a significant association between boredom proneness and Problematic Social media use.	Potential publication biases were explored graphically via funnel plots and statistically with Egger's regression tests for funnel plot asymmetry. Results showed an absence of publication biases.	10
Casale & Banchi, 2020	Systematic review of 21 studies (19 cross-sectional and two longitudinal) from 12 countries.	N = 29679 adolescents and adults	(i) grandiose narcissism (k = 18; n = 28759);(ii) vulnerable narcissism (k = 6; n = 2269)	Consistent results were reported regarding the positive and significant association between grandiose narcissism and Problematic Facebook Use (0.13 < r < 0.32). The only two studies that included a vulnerable narcissism measure reported a positive and significant correlation with PFU as well. Studies that did not distinguish between different online platforms (i.e., those measuring Problematic social media use) reported less consistent results.	The studies were critically appraised using the AXIS tool. The quality assessment highlighted a low risk of bias (M = 14.45 ± 2.90)	6
Casale et al., 2021	Systematic Review of eight cross-sectional studies from five countries	N = 2663adolescents, young adults and adults	Metacognitions	Positive beliefs about worry, negative beliefs about thoughts concerning uncontrollability and danger, beliefs about the need to control thoughts and a lack of cognitive confidence were associated with PSNU. Moreover, specific metacognitions about social network use emerged correlated to PSNU.	AXIS tool for quality assessment	6
Cunningham et al., 2021	Meta-analysis of 20 cross-sectional studies (countries NR)	N = 36974 adolescents, young adults and adults	Depression	The pooled effect size expressed as a correlation was 0.29 (95 % CI = 0.23 – 0.35), p < 0.001.	Funnel plot, and Egger's test were used to assess publication bias. Results showed no significant bias.	6

(continued on next page)

Table 1 (*continued*)

Authors (year)	Number of studies included and studies' design	Population and sample size	Risk factors examined	Main findings	Quality of evidence	AMSTAR score (0–11)
D'Arienzo et al., 2019	Systematic review of 32 cross-sectional studies from 19 countries.	N = 18,247 adolescents and adults	Insecure Attachment	Findings demonstrated a significant positive association between insecure attachment (anxious and avoidant) and a more intensive and dysfunctional use of the internet and social media.	Authors reported methodological issues of included studies without using a validated tool.	4
Du et al., 2024	Meta-analysis of 209 cross-sectional studies from 28 countries.	N = 252,337 adolescents and adults	(i) General Anxiety: (k = 68; n = 126688);(ii) Social Anxiety (k: k = 44; n = 65410)(iii) Insecure Attachment (k = 22, n = 11580)(iv) Fear of missing out (k = 75, n = 48659)	The results showed a moderately positive association between PSNU and generalized anxiety (GA), social anxiety (SA), attachment anxiety (AA), and fear of missing out (FoMO) respectively (GA: r = 0.388, 95 % CI [0.362, 0.413]; SA: r = 0.437, 95 % CI [0.395, 0.478]; AA: r = 0.345, 95 % CI [0.286, 0.402]; FoMO: r = 0.496, 95 % CI [0.461, 0.529])	Funnel plots, fail-safe number (Nfs) and Egger linear regression were utilized to evaluate the publication bias. There was no significant publication bias.	10
Fioravanti et al., 2021	Meta-analysis of 33 cross-sectional studies from 18 countries	N = 21473adolescents and adults	Fear of missing out (k = 20, n = 11021)	Results showed a positive correlation between PSNU and FoMO (Fisher's z = 0.486; SE = 0.031; 95 % CI 0.426, 0.547; Z = 15.695; p < 0.001).	To assess publication bias, funnel plot interpretation and Egger's regression intercepts were used. Results showed a low risk of publication bias.	8
Gioia et al., 2021	Systematic Review of five cross-sectional studies from three countries	N = 2081adolescents and young adults	Emotional dysregulation	Several studies found a strong association between emotion dysregulation and PSNU	NR	3
Huang, 2020	Meta-analysis of 33 studies (type of studies design NR) from 32 countries	N = 244676adolescents, young adults and adults	(i) Low psychological well-being (k = 30; n = 168771); (ii) low self-esteem (k = 42; n = 44840); (iii) anxiety (k = 17; n = 32896) (iv) Social anxiety (k = 17; n = 13033); (v) depression (k = 59; n = 58783); (vi) Loneliness (k = 29; n = 17246)	Results show significant correlations between PSNU and self-esteem (r = −0.17, p < 0.05), anxiety (r = 0.30, p < 0.001), social anxiety (r = 0.30, p < 0.001), depression (r = 0.31, p < 0.001), loneliness (r = 0.21, p < 0.001), life satisfaction (r = −0.11, p < 0.001)	NR	5
Huang, 2022	Meta-analysis of 63 studies (type of studies design NR) across 28 countries	N = 32,032Adolescents, young adults and adults	(i) High neuroticism (k = 31; n= NR) (ii) Low conscientiousness (k = 28; n= NR) (iii) Low agreeableness (k = 27; n= NR); (iv) High extraversion (k = 29; n= NR) (v) Low openness to experiences (k = 25; n= NR);	The correlations between PSNU and neuroticism, extraversion, openness, agreeableness and conscientiousness were r = 0.17, 0.03, −0.03, −0.07 and −0.15, respectively.	NR	6
Hussain & Griffiths, 2018	Systematic review of nine cross-sectional studies from nine countries.	N = 40988adolescents and young adults	(i) Anxiety (k = 6, n = 31714), (ii) Depression (k = 7, n = 40988); (iii) Stress (k = 2, n = 509); (iv) Obsessive-compulsive disorder (k = 1; n = 23533); (v) Attention-Deficit/ Hyperactivity Disorder (k = 1; n = 23533);	There was a positive association between PSNU and depression, anxiety, stress, ADHD, and OCD.	NR	5
Hussain et al., 2020	Systematic review (n = 10) of 10 studies (nine cross-sectional and one prospective cohort study) from three countries.	N = 15492children, adolescents and young adults	(i) Anxiety (k = 4, n = 1904), (ii) Depression (k = 8, n = 13895),	Associations between PSNU, depression, and anxiety were reported in 10 studies. In eight (of the 10) studies, symptom severity of PSNU was associated with depression. Four studies reported associations between PSNU and anxiety.	NR	5
Hylkilä et al., 2024	Systematic Review of 21 cross-sectional studies from 16 countries.	N = 7484young adults	Fear of negative evaluation (k = 2, n = 636); need to belong (k = 2, n = 668); need for assertiveness (k =	Results showed mixed results concerning the association between need to belong and PSNU. Need for	Standardized critical appraisal instruments from the JBI were used to evaluate quality of the	8

Table 1 (*continued*)

Authors (year)	Number of studies included and studies' design	Population and sample size	Risk factors examined	Main findings	Quality of evidence	AMSTAR score (0–11)
			1, n = 400); need for self-presentation (k = 1, n = 400);preference for online social interaction (k = 2, n = 732);escapism (k = 2, n = 675); passing time (k = 1, n = 397); Recreation/ Gratification motives (k = 2, n = 724); Social motives (k = 1, n = 397) Utilitarian motives (k = 1; n = 327)	self-presentation and need for assertiveness correlated positively and significantly with PSNU. A positive association between Fear of negative evaluation and PSNU emerged. Preference for online social interaction was significantly correlated with PSNU. Escapism and passing time were significantly associated with PSNU Positive relationships between utilitarian motives and PSNU. Results showed mixed results concerning the association between social motives and PSNU.Results showed mixed results concerning the association between Recreation/ Gratification motives and PSNU.	included studies. All studies had a methodological quality of at least 50 %.	
Keles et al., 2019	Systematic review of 13 studies (12 cross-sectional and one longitudinal) from 14 countries.	N = 21231 adolescents	Depression (k = 3, n = 2352)	Social media addiction/ Facebook addiction /social networking sites addiction was positively associated with depression.	The quality of eligible studies was assessed using the National Institutes of Health Quality Assessment tool for Observational Cohort and Cross-Sectional Studies. Generally, the methodological quality was poor to fair.	7
Marciano et al., 2020	Meta-analysis of 12 cross-sectional studies from eight countries	N = 5949adolescents, young adults and adults	High neuroticism	PSNU resulted significantly correlated with neuroticism (r = 0.277, p < 0.01).	Egger's regression test for funnel plot asymmetry was run to identify the presence of possible publication biases. Results suggest the presence of publication bias (asymmetry of funnel plot and p of Egger's test < 0.05).	8
Marino, Gini, Vieno, & Spada, 2018a	Meta-analysis of 56 cross-sectional studies from 20 countries.	N = 27867 adolescents and adults	(i) High neuroticism (k = 16; n = 7458) (ii) Low Extraversion (k = 16; n = 7458) (iii) Low conscientiousness (k = 15; n = 7217) (iv) Low Agreeableness (k = 15; n = 7217) (v) Low Openness to Experiences (k = 15; n = 7217) (vi) Low self-esteem (k = 8; n = 3205);(vii) Motives for Facebook use - Internal source (k = 10, n = 5537) - External source (k = 14, n = 7241) - Negative valence (k = 10, n = 5489) - Positive valence (k = 15, n = 7386)	Neuroticism (ES = 0.22), extraversion (ES = −0.06), conscientiousness (ES = −0.16), and self-esteem (ES = −0.23) were significantly associated with problematic Facebook use. Openness and agreeableness resulted not significantly correlated (ES = −0.07, ES = −0.06, respectively).Motives with an internal source (i.e., coping, information seeking, etc.) and those with external sources (i.e., socialization, conformity, etc.) were positively associated with problematic Facebook use (ES = 0.44 and ES = 0.33, respectively).Both motives with negative valence (to reduce negative feelings) and motives with positive valence (to enhance positive feelings) were positively associated with problematic Facebook use	The potential "publication bias" were evaluated with the Kendall's tau method, the egger's regression test, the symmetry of the funnel plot, and the trim-and-fill. Results showed a low risk of publication bias.	6

Table 1 (*continued*)

Authors (year)	Number of studies included and studies' design	Population and sample size	Risk factors examined	Main findings	Quality of evidence	AMSTAR score (0–11)
				(ES = 0.44; ES = 34, respectively).		
Marino, Gini, Vieno, & Spada, 2018b	Meta-analysis of 23 cross-sectional studies from 11 countries.	N = 13929 adolescents and young adults	(i) depression (k = 8, n = 6041); (ii) anxiety (k = 8, n = 5950); (iii) Low psychological well-being (i. e., general well-being k = 12, n = 8160; Life satisfaction k = 6, n = 3283).	Problematic Facebook use was significantly associated with depression (r = 0.35, p < 0.001), anxiety (r = 0.33, p < 0.001), general well-being (r = −0.22, p < 0.001), and life satisfaction (r = −0.19, p < 0.001).	Potential publication bias was evaluated with rank correlation Kendall tau, Egger's regression test, and the trim and fill method. Results showed that Publication bias was not a likely threat.	6
Meynadier, Malouff, Schutte, & Loi, 2024	Meta-analysis of 14 studies (12 cross-sectional, one longitudinal, one experimental testing a 10-day intervention). (countries NR)	N = 5355adolescents and adults	Low dispositional mindfulness	A lower level of mindfulness was associated with more problematic social media use, with a weighted effect size of r = −0.37, 95 % CI [-0.42, −0.33].	The impact of publication bias was evaluated with Egger's test for funnel plot asymmetry, Begg's rank correlation test, and Duval and Tweedie's trim-and-fill method. The results were not affected by publication bias.	9
Meynadier, Malouff, Loi, & Schutte, 2024	Meta-analysis of 97 cross-sectional studies from 29 countries	N = 53913adolescents, young adults and adults	(i) High neuroticism (k = 108; n= NR) (ii) Low conscientiousness (k = 96; n= NR) (iii) Low agreeableness (k = 93; n=NR); (iv) Low openness to experience (k = 88; n=NR) (iv) high extraversion (k = 102; n= NR)	The *meta*-analysis found that high neuroticism (r = 0.21, p < 0.001, 95 % CI [.19, 0.23]), low conscientiousness (r = −0.16, p < 0.001, 95 % CI [-0.19, −0.13]), low agreeableness (r = −0.07, p < 0.001, 95 % CI [-0.10, −0.05]), and low openness (r = −0.04, p = 0.001, 95 % CI [-0.06, −0.02]) were significantly associated with problematic social media use. Extraversion resulted not significantly correlated.	Potential publication bias was evaluated with rank correlation Kendall tau, Egger's regression test, and the trim and fill method. For the most part, these tests suggested that the *meta*-analytic correlation estimates for openness and agreeableness were likely impacted by publication bias. However, these tests suggest that estimates for conscientiousness, extraversion, and neuroticism were not significantly impacted by publication bias.	8
Musetti et al., 2022	Systematic review of 32 cross-sectional studies from 15 countries.	N = 16,938 adolescents and adults	Insecure Attachment	PSNU was negatively associated with indicators of secure attachment and positively associated with indicators of attachment anxiety, whereas results regarding indicators of attachment avoidance were mixed	The AXIS tool was employed.The average score for all studies was 14.66 (SD = 2.22) highlighting a medium quality.	7
Niu et al., 2023	Meta-analysis of 82 cross-sectional studies from 14 countries.	N = 6456 adults	Insecure Attachment	The analysis conducted on 79 effect sizes revealed that PSNU was positively correlated with insecure attachment.	Funnel plot, egger's regression test and trill and fill methods were used indicating some risk of publication bias	8
O'Day & Heimberg, 2020	Systematic review of 52 studies (nine longitudinal, seven experimental, 37 cross-sectional).	N = 14953 young adults	(i) Social anxiety; (ii) Loneliness	Social anxiety and loneliness are associated with problematic social media use. Loneliness appears to be a risk factor for engaging problematically online.	NR	4
Rajesh & Rangaiah, 2022	Meta-analysis of 96 studies (type of studies design NR), 40 conducted in eastern region and 56 studies in western region	N = 35608 participants (type of population NR)	(i) Low openness to experience (k = 51, n = 24348); (ii) Low agreeableness (k = 49; n = 24363); (iii) Low conscientiousness (k = 49; n = 24363); (iv) High neuroticism (k = 57; n = 27325); (v) Low Extraversion (k = 53; n = 25133);(vi) loneliness (k = 19; n = 7865); (vii) narcissism − unspecified (k = 21; n = 5209); (viii) impulsivity (k = 10; n =	Openness to experience (ES = −0.050), agreeableness (ES = −0.069), conscientiousness (ES = −0.145), loneliness (ES = 0.231), narcissism (ES = 0.228), impulsivity (ES = 0.254), shyness (ES = 0.198) were significantly related to Facebook addiction. Extraversion and neuroticism were not related (ES = 0.009 and ES = 0.032, respectively).	Publication bias was assessed using Kendal's tau method and eggers regression test. The results suggested that there is a less probability of publication bias.	6

Table 1 (*continued*)

Authors (year)	Number of studies included and studies' design	Population and sample size	Risk factors examined	Main findings	Quality of evidence	AMSTAR score (0–11)
			2781); (ix) shyness (k = 6; n = 2596)			
Saiphoo et al., 2020	Meta-analysis of 32 cross-sectional studies	N= NR	Self-esteem	A significant negative relationship between self-esteem and PSNU emerged (r = −0.18, p < 0.001).	The funnel plot and the Trim-and-Fill Method were used to assess publication bias indicating a low risk.	6
Sanchez-Fernandez & Borda-Mas, 2023	Systematic review of 117 studies (type of studies design NR) from various countries.	N=NR university students	(i) Low psychological well-being (k = 11, n = 5361); (ii) Negative affect (k = 8, n = 3969); (iii) Fear of Missing Out (k = 4, n = 1513).	Negative affect (i.e., depression, anxiety, perceived stress) and Fear of Missing Out were potential risk factors for PSMU. Well-being was a potential protective factor against PSMU.	The "quality assessment tool for observational cohort and cross-sectional studies" was used. None of the studies displayed poor quality.	7
Shannon et al., 2022	Meta-analysis of 18 cross-sectional studies from eight countries.	N = 9269adolescents and young adults	(i) Anxiety (k = 9, n = 5932);(ii) Depression (k = 11, n = 6038); (iii) Stress (k = 6, n = 3872)	Statistically significant correlations between PSNU and depression (r = 0.273, p < 0.001), anxiety (r = 0.348, p < 0.001), stress (r = 0.313, p < 0.001).	Funnel plot, and Egger's test were used to assess publication bias. The funnel plot shows slight asymmetry, suggesting slight publication bias, however Egger's test for small-study effects was not significant (p = 0.35).	7
Shin et al., 2022	Meta-analysis of 531 studies (476 cross-sectional, 52 longitudinal and three studies used both designs).(countries NR)	N=NR adolescents and adults	Depression (k = 36, n=NR)	Results showed a positive association between online media use and depressive symptoms, with a stronger effect when online behavior is measured using addiction scales.	The Newcastle-Ottawa Scale was used to assess quality of studies included, while publication bias was evaluated with funnel plot and egger's regression test. No evidence of publication bias emerged.	10
Tang et al., 2024	Meta-analysis of 19 studies. Of these, two examined Problematic Mobile Social Media Use with cross-sectional designs from one country.	N = 21398 adolescents (n = 1871 for Problematic Mobile Social Media Use)	Childhood Trauma	Problematic Mobile Social Media Use is significantly correlated with childhood trauma (r = 0.33)	Funnel plot and Egger's regression test suggesting a low risk of publication bias	10
Vossen et al., 2024	Systematic review of 42 cross-sectional studies from Europe (k = 15) Asia (k = 19), Middle East (k = 7), Northern America (k = 1)	N = 195571adolescents and young adults	(i) Negative parenting;(ii) Negative parent–child relationships/Negative family climate	Parenting characterized by inconsistency, rejection, overprotection, harsh parenting, and psychological control is correlated with more symptoms of PSMU.Results showed a negative association between family climate and the quality of the parent–child relationships with PSMU.	Not Reported	5
Wu et al., 2024	Meta-analysis of 56 studies (type of studies design NR, 32 from Eastern countries and 24 from Western countries.	N = 59,928	Social anxiety	Results showed that social anxiety and problematic social media use were highly positively correlated (r = 0.335, 95 % CI = [0.304, 0.365], p < 0.001).	Funnel plot, Begg's tests, and Egger's test were used to assess publication bias. Results showed no significant bias.	9
Yigiter et al., 2024	Meta-analysis of 38 cross-sectional studies from one country	N = 14935Adolescents, university students and adults	Depression	The findings of the random effects *meta*-analysis showed that there was a positive and small association between PSMU and depression (r = 0.321 [0.283, 0.358], p < 0.05).	Publication bias was investigated with funnel plot symmetry and PET/ PEESE methods resulting in a low risk of publication bias	8
Zhu et al., 2022	Meta-analysis of 75 studies. Of these, 5 examined social media addiction with cross-sectional designs from three countries.	N = 114098 adolescents and young adults(n for social media addiction studies NR)	Negative parent–child relationships/negative family climate	Results showed a negative association between quality of parent–child relationship and social media addiction (mean r = −0.27).	Funnel plot and Egger's regression test suggesting a low risk of publication bias	7

Note. NR = Not Reported.

supported a positive relationship between PSNU and (i) depression (n = 12), (ii) anxiety (n = 9), (iii) social anxiety (n = 4), (iv) stress (n = 4), (iv) Obsessive Compulsive Disorder (n = 1), (v) Attention-Deficit/Hyperactivity Disorder (n = 1). The association between PSNU and low psychological well-being was reported by three systematic reviews/*meta*-analyses.

One systematic review reported a strong association between emotion dysregulation and PSNU, whereas one *meta*-analysis found a relationship between low dispositional mindfulness and PSNU.

We found eight systematic reviews/*meta*-analyses that summarized the literature on the relationship between (more than one) psychosocial

characteristic and PSNU, finding a relevant role for loneliness (n = 5), fear of missing out (n = 3), and fear of negative evaluation (n = 1).

3.1.2. Behavior-specific predisposing variables for PSNU

One systematic review explored the association between psychological needs and PSNU, finding that the need for self-presentation and assertiveness positively correlated with PSNU (evidence was only based on one study). In contrast, mixed results were found concerning the association between the need to belong and PSNU. One systematic review and one *meta*-analysis analyzed the relationship between motives and PSNU, finding an association with escape, passing the time, coping/

Table 2
Psychological risk factors for PSNU across Internet Gaming Disorder, problematic pornography use, and compulsive online shopping.

		Internet Gaming Disorder	Problematic Pornography Use	Compulsive Online Shopping
General predisposing variables				
Negative early childhood experiences	Childhood Trauma	X	X	X
	Negative parent–child relationships/negative family climate	✓(e.g., Schneider et al., 2017)	X	X
	Negative parenting	✓(e.g., Lukavská et al., 2022)	X	X
	Insecure attachment	✓ (e. g., Niu et al., 2023)	✓(e.g., Akbari et al., 2024)	X
Personality traits	High Neuroticism	✓(e.g., Chew, 2022)	✓(e.g., Akbari et al., 2024)	✓(e.g. Claes & Müller, 2017)
	Low Conscientiousness	✓(e.g., Chew, 2022)	✓(e.g., Akbari et al., 2024)	✓(e.g. Claes & Müller, 2017)
	Low Agreeableness	✓(e.g., Chew, 2022)	✓(e.g., Akbari et al., 2024)	✓(e.g. Claes & Müller, 2017)
	Low Openness to Experiences	✓(e.g., Chew, 2022)	X	X
	High Extraversion	✓(e.g., Chew, 2022)	X	X
	Impulsivity	✓(e.g., Ropovik et al., 2023)	✓(e.g., Bocci Benucci et al., 2024)	✓(e.g. Claes & Müller, 2017)
	Shyness	X	X	X
	Grandiose narcissism	✓(e. g., Moor & Anderson, 2019)	✓(e. g. Akbari et al., 2024)	X
	Vulnerable Narcissism	X	X	X
	Boredom Proneness	X	X	X
Low self-esteem		✓(e.g., Kavanagh et al., 2023)	✓(e.g., Vieira & Griffiths, 2024)	X
Psychopathology	Anxiety	✓(e.g., Coutelle et al., 2024)	✓(e.g., Vieira & Griffiths, 2024)	X
	Depression	✓(e.g., Coutelle et al., 2024)	✓(e.g., Vieira & Griffiths, 2024)	X
	Social anxiety	✓(e.g., Gioia et al., 2022)	X	X
	Stress	✓(e.g., Chang et al., 2023)	✓(e.g., Vieira & Griffiths, 2024)	X
	Obsessive Compulsive Disorder	X	X	X
	Attention-Deficit/Hyperactivity Disorder	✓(e.g., Coutelle et al., 2024)	X	X
Low psychological well-being		✓(e.g.,(Cheng et al., 2018)	X	X
Emotion dysregulation		✓(e.g., Estupiñá et al., 2024)	X	X
Low dispositional mindfulness		X	X	X
Psychosocial characteristics	Loneliness	✓(e.g., Pallavicini et al., 2022)	✓(e.g., Vieira & Griffiths, 2024)	X
	Fear of Missing Out	✓(e.g., Caba-Machado et al., 2024)	X	✓(e.g., Alfina, 2023)
	Fear of Negative Evaluation	✓(e.g., Gioia et al., 2022)	X	X
Behavior-specific predisposing variables				
Needs	Need to Belong	X	X	X
	Need for Assertiveness	X	X	X
	Need for Self-Presentation	X	X	X
Using motives	Escape	✓(e.g., Ropovik et al., 2023)	X	X
	Coping /Compensation motives	✓(e.g., Ropovik et al., 2023)	X	X
	Passing Time	X	X	X
	Recreation/Gratification motives	✓(e.g., Ropovik et al., 2023)	X	X
	Social motives	✓(e.g., Ropovik et al., 2023)	X	X
	Utilitarian motives (e.g., business, politics, religion, education)	X	X	X
Internet-related cognitions	Preference for Online Social Interaction	X	X	X
Metacognitions		✓(e.g., Casale et al., 2021)	X	X

Note. ✓ = at least one systematic review/*meta*-analysis; X = no systematic review/*meta*-analysis.

compensation, recreation/gratification, and social and utilitarian motives. One systematic review found evidence for POSI as a risk factor for PSNU. Finally, one systematic review evidenced that both generic and specific metacognitions about social network use were correlated with PSNU.

3.2. Psychological risk factors for PSNU across internet gaming disorder, problematic pornography use, and compulsive online shopping

Results of the bibliometric analysis conducted to investigate if the identified psychological risk factors were shared across other problematic online behaviors (i.e., Internet Gaming Disorder, Problematic Pornography Use and Compulsive Online Shopping) are summarized in Table 2. If at least one systematic review or *meta*-analysis concerning each PSNU risk factor and the other problematic online behaviors exist, this is reported in Table 2.

3.2.1. General predisposing variables for PSNU across other problematic online behaviors

Among negative childhood experiences, the role of negative quality of parent–child relationship/family climate and negative parenting was found to be predictive of IGD by at least one systematic review/*meta*-analysis. In particular, a poorer parent–child relationship (Schneider et al., 2017) and low parental warmth (Lukavská et al., 2022) were associated with increased problematic online gaming. Insecure attachment was positively correlated with IGD and PPU. Finally, we did not find any systematic review/*meta*-analysis on the relationship between childhood trauma and IGD, PPU or COS. The inspection of primary studies showed that some preliminary evidence exists for the association between insecure attachment and adverse family climate and COS (e.g. Topino, Cacioppo, & Gori, 2022), as well as for the association between childhood trauma and IGD, PPU and COS (e.g., Shi et al., 2020, Kor et al., 2014, David et al., 2024).

Among personality traits, high neuroticism, low conscientiousness and low agreeableness were found to be associated with IGD, PPU and COS by at least one systematic review/*meta*-analysis. Low openness to experiences and high extraversion were associated with IGD. The inspection of primary studies revealed some evidence about the relationship between high extraversion and high openness to experiences and COS (e.g., Tarka et al., 2021, Uzarska et al., 2023), and between high extraversion and high openness to experiences and PPU (e.g., Borgogna & Aita, 2019). Evidence based on at least one systematic review/*meta*-analysis emerged for the association between high impulsivity and IGD, PPU and COS. Grandiose narcissism was associated with both IGD and PPU, whereas for vulnerable narcissism, we did not find any systematic review/*meta*-analysis. No systematic review/*meta*-analysis was also found on the relationship between shyness and boredom proneness and IGD, PPU, or COS. The inspection of primary studies showed that some preliminary evidence exists for the predictive role of vulnerable narcissism in the context of IGD (e.g. Di Blasi et al., 2020), PPU (e.g., Grubbs et al., 2023) and COS, where initial evidence was also found for grandiose narcissism (e.g., Zerach (2016)), as well as for the positive association between boredom proneness and IGD (e.g. Li et al., 2021) and COS (e.g. Bozaci, 2020). Finally, shyness was positively correlated with IGD symptoms (e.g. Wang et al., 2022) and COS (e.g., Dhaundiyal & Coughlan, 2016).

At least one systematic review/*meta*-analysis exists about the association between low self-esteem and IGD and PPU. In contrast, only primary studies linked low self-esteem to COS (e.g., Olsen et al., 2021).

Regarding psychopathology, depression, anxiety and stress symptoms were associated with IGD and PPU by at least one systematic review/*meta*-analysis. Social anxiety and Attention-Deficit/Hyperactivity Disorder symptoms were also found in IGD. Primary studies provide evidence for a positive relationship between anxiety, depression and online buying-shopping disorder (e.g. Müller et al., 2019). Recently, a scoping review suggested significant correlations between general

perceived stress and COS symptom severity (Thomas et al., 2024). Empirical studies also showed a positive association between Obsessive Compulsive Disorder symptoms and IGD (e.g. Starcevic & Aboujaoude, 2017), PPU (e.g., Kraus et al., 2015), and COS (e.g. Gori et al., 2022).

Psychological well-being (mainly conceptualized as life satisfaction) was found to be negatively associated with IGD by at least one systematic review/*meta*-analysis. Evidence from primary studies showed that PPU and COS were associated with low satisfaction with life (e.g. Altin et al., 2024; Olsen et al., 2021).

Emotional dysregulation plays a role in IGD, primarily through strategies such as emotional suppression and lack of abilities to understand and control emotions (for a systematic review, see Estupiñá et al., 2024). The inspection of primary studies showed that PPU and COS were significantly and positively correlated with difficulties in emotion regulation (e.g., Cardoso et al., 2022; Estévez et al., 2020).

We found no systematic review/*meta*-analysis on the relationship between low dispositional mindfulness and IGD, PPU, or COS. However, primary studies have found a role of dispositional mindfulness in IGD and COS (e.g., Chiorri et al., 2023; Brunelle & Grossman, 2022).

Regarding psychosocial characteristics, loneliness was associated with IGD and PPU, whereas Fear of Missing Out was associated with IGD and COS through at least one systematic review/*meta*-analysis. Fear of negative evaluation was also found in IGD. The inspection of primary studies evidenced that fear of negative evaluation and loneliness was positively related to COS (e.g. Biolcati, 2017; Rachubińska et al., 2021).

3.2.2. Behavior-specific predisposing variables for PSNU across other problematic online behaviors

Regarding psychological needs, no systematic review/*meta*-analysis about the association between the need to belong, the need for assertiveness and the need for self-presentation and IGD, PPU and COS was found. Primary studies found that the need to belong plays a role in COS (e.g., Zhang et al., 2024).

Among using motives, we found evidence sustained by at least one systematic review/*meta*-analysis that escape and coping motivation were the most strongly connected to IGD, followed by fantasy, achievement/competition, and social motive, with recreation motivation barely connected to IGD. The inspection of primary studies suggests that all the motives predictive for PSNU were also associated with PPU and COS (e.g., Mennig et al., 2024; Darrat et al., 2016; Testa et al., 2024; Sundström et al., 2019; Xue et al., 2024; Horváth & Adıgüzel, 2018), except for social motives, for which we did not find evidence for a role in PPU and COS, and utilitarian motives that seem to be not related to IGD and COS. Sexual pleasure, self-exploration and sexual curiosity motivation emerged as additional motivations involved in PPU (e.g. Böthe et al., 2022). Idea shopping motivation (i.e., the desire to keep up with trends and new fashions and to see new products and innovations as a way to express one's own uniqueness and self-identity) and role-play motivation (i.e., the consumers' perceived pleasure derived from buying for their friends and relatives) emerged as additional motives in COS (e.g., Horváth & Adıgüzel, 2018).

Regarding Internet-related cognitions, no systematic review/*meta*-analysis about the association between POSI and IGD, PPU and COS was found. Primary studies found that POSI was associated with IGD (e.g., Marino et al., 2020). Finally, metacognitions were found to be associated with IGD by at least one systematic review/*meta*-analysis. The inspection of primary studies revealed that metacognitions about online shopping contribute to COS (e.g., Fioravanti et al., 2024). Furthermore, although not explicitly focused on PPU, metacognitions about sex were found to predict compulsive sexual behavior disorder (e.g., Efrati & Spada, 2024).

4. Discussion

The current overview of systematic reviews/*meta*-analyses was conducted to identify the psychological risk factors consistently

associated with PSNU and evaluate whether the findings about these risk factors are consistent across different problematic online behaviors.

Summarizing the findings on the basis of the amount and the quality of evidence, the general predisposing factors for PSNU most consistently reported were insecure attachment (suggesting that people with anxious and avoidant attachment may be more prone to overuse SNs as a dysfunctional way of coping with relational insecurities), a personality profile of high neuroticism and low conscientiousness (indicating that people with high neuroticism may frequently use social media as a way to manage the negative emotions they often experience, and that individuals with low conscientiousness may be less focused on important responsibilities and deadlines, making them more prone to using social media in a problematic or addictive way for immediate gratification), low self-esteem (sustaining the social compensation hypothesis- Kraut et al., 2002-, according to which people with low self-esteem compensate their difficulties in social relations when using the Internet), high level of depression, anxiety and stress symptoms (suggesting that people may use SNs as a coping method to cope with psychological distress), high social anxiety (individuals who are socially anxious being more inclined to socialize online and overuse social media to compensate for their social needs), loneliness (lonely individuals may turn towards social media to compensate for the dearth of offline relationships, receive social support and satisfy interpersonal need) and fear of missing out (those who are concerned that they might miss an opportunity for social interaction and/or rewarding experiences happening across their friend networks are more likely to show a deficient self-regulation in their own use of SNs because of the need to stay continually connected to what their friends are doing and to alleviate anxious feelings of being socially excluded). Regarding behavior-specific predisposing variables for PSNU, a small number of systematic reviews/*meta*-analyses was found. Preliminary evidence indicated that satisfying unmet needs (i.e. the need for self-presentation, assertiveness and belonging) through SNs may represent a pathway towards PSNU, confirming that those who attempt to obtain social benefits or social control via the Internet are also likely to experience negative outcomes and may be at-risk for PSNU (Caplan, 2007). Furthermore, POSI emerged as a relevant Internet-related cognition involved in PSNU. According to the social skill model of problematic internet use (Caplan, 2005) POSI is a cognitive precursor of the tendency to use Internet communication services for regulating negative mood states, the compulsive use of web social services, and the presence of negative outcomes in real life. Studies showed that motives related to social purposes for SNs use – for example, socialization, communication, social interaction – and motives related to regulating one's feelings (trying to enhance positive feelings and reducing negative ones) – for example, escapism and passing time – were likely to lead to PSNU. Indeed, according to the compensatory model of Internet use (Kardefelt-Winther, 2014), users are driven to use different Internet applications like SNs to escape real-life problems or alleviate negative emotional states, which sometimes results in adverse consequences. Finally, empirical evidence supports the role of generic metacognitions (i.e. low cognitive confidence and high beliefs about the need to control thoughts) and positive and negative metacognitions about SNs use (i.e. the beliefs about the usefulness of using SNs as a cognitive and affective self-regulation strategy and the beliefs about the uncontrollability and dangers of SNs use and SNs-related thoughts, respectively) in PSNU, giving initial support for the application of the metacognitive model of addictive behaviors (Spada et al., 2015) to PSNU.

Results of the bibliometric analysis conducted to investigate if the identified psychological risk factors were shared across other problematic online behaviors showed that the general predisposing factors most consistently reported for PSNU obtained some evidence (based on systematic reviews/*meta*-analyses and primary studies) also in Internet Gaming Disorder, Problematic Pornography Use and Compulsive Online Shopping with some exceptions (i.e., social anxiety was found to be associated only with IGD, whereas we found no studies in the context of PPU and COS). Among the behavior-specific predisposing variables that

emerged for PSNU, we did not find studies about the association between the need for assertiveness and the need for self-presentation and IGD, PPU and COS, whereas the need to belong appears to be involved in COS. Among using motives, although motives related to regulating one's feelings were shared with all the other problematic online behaviors considered, some specificity emerged. We did not find evidence for the role of social motives in PPU and COS. Furthermore, additional motivations emerged, such as achievement/competition in IGD, self-exploration and sexual curiosity in PPU, and idea shopping motivation in COS. Preference for online interaction emerged as an important factor in the development of IGD (although few primary studies supported this evidence), suggesting that psychosocially vulnerable gamers tend to prefer online social interactions within the game world rather than face-to-face contact, as online games provide a safer environment for socializing with others. Metacognitions were found to play a role also in other problematic online behaviors, further supporting previous arguments that metacognitions have a transdiagnostic nature (Spada et al., 2015).

This overview emphasized that some psychological factors, such as insecure attachment personality traits, self-esteem, psychological distress and psychosocial characteristics, are linked to PSNU. These factors can be considered shared risk factors, as they have been associated with a range of behaviors within the spectrum of problematic online behaviors, as well as other behavioral and substance addictions, more broadly. The existence of common or shared risk factors confirmed the hypothesis of grouping problematic online behaviors into a spectrum of related disorders (e.g., Billieux, 2012). Additionally, the non-specificity of the findings for most risk factors investigated may be partially explained by the fact that problematic online behaviors were mainly measured by adopting behavioral and substance addiction criteria. If the problematic online behavior is measured a priori as an addictive behavior (i.e., by adopting a confirmatory approach), this could increase the likelihood of identifying the same psychological risk factors associated with other addictive behaviors (Kardefelt-Winther, 2014). Rather than relying on substance addiction symptoms, researchers should identify the specific underlying etiological and psychological processes of each excessive behaviors (Kardefelt-Winther et al., 2017).

In the current overview, some evidence about specific risk factors has emerged (see Fig. 2). Specifically, social anxiety and deficits in social

Psychological risk factors for Problematic Social Network Use

SHARED
Insecure attachment
High neuroticism, low conscientiousness
Low self-esteem
Depression, anxiety, stress symptoms
Loneliness
Fear of Missing Out
Emotion regulation motives (e.g., escape real-life problems, enhance positive feelings and reducing negative ones)
Generic and behavior-specific metacognitions

SPECIFIC
Social anxiety
Social motives (e.g., socialization, communication)
Psychological needs (i.e., the need for self-presentation, assertiveness and belonging)
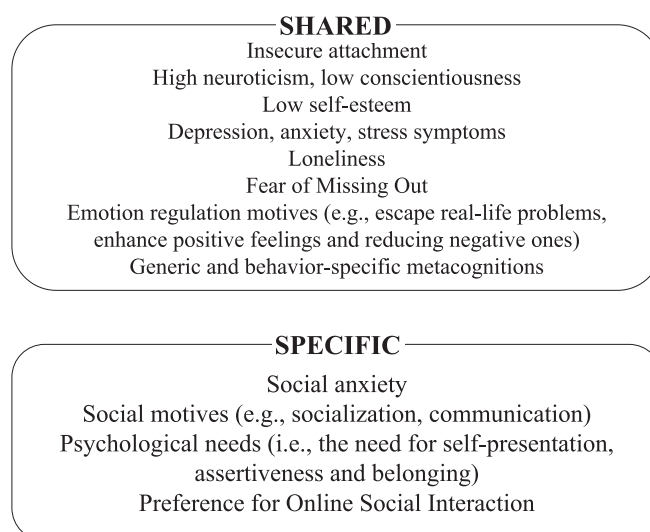Preference for Online Social Interaction

Fig. 2. Psychological risk factors for Problematic Social Network Use.

skills may lead individuals to prefer interacting with people through specific online activities such as gaming and social network. Furthermore, other specific risk factors can be identified in the motives behind the online behavior (e.g., overuse of social networks is often driven by interpersonal motives, while excessive online gaming is more frequently associated with motives related to achievement and immersion). These results support the usefulness of the motivational framework to deepen our understanding of problematic Internet use and enable a more thorough analysis of the potentially pathological behaviors that emerge in individuals' interactions with online applications (Schimmenti, 2023). The motivational framework is based on the idea that the origins of problematic online behaviors lie in the appetitive aspect of these specific behaviors for a particular individual in the context of his/her unique needs and personal history. Exploring the role of needs, motives and cognitions (related to that particular online behavior) and how they interact with personal core characteristics could help identify the aetiology and the manifestations of problematic online behaviors. Theoretical models should be revised accordingly. The most important challenge for researchers should be to elucidate further the specific psychological risk factors and how they interact to identify the pathways leading to the problematic use of that specific online activity. This approach has been applied to problematic smartphone use (i.e. the pathway model proposed by Billieux, 2012) and PSNU (i.e. the fear-driven/compensation-seeking hypothesis and the reward- hypothesis proposed by Wegmann & Brand, 2019). However, these pathways should be further investigated and empirically validated in greater detail.

As suggested by the results of the current overview, much research should be conducted on the specific behavior-predisposing factors and their interactions. Furthermore, it is necessary to understand how the online environment contributes significantly to the expression of specific addictive behaviors and common variance across these behaviors (Baggio et al., 2018).

4.1. Strengths and limitations

To our knowledge, the current study provides the first broad overview of previous systematic reviews/*meta*-analyses exploring the psychological risk factors for PSNU. This overview has some strengths, including a comprehensive search strategy, duplicate screening, data extraction conducted by independent raters, and the use of a validated instrument (AMSTAR) to assess the methodological quality of included reviews.

The current overview has some limitations that should be taken into account. First, due to limited resources, we did not assess the overlap between the included reviews concerning the studies they included. Frequencies and findings should be interpreted with a potential overlap in mind. Second, we did not systematically review all the systematic reviews/*meta*-analyses on the psychological risk factors for IGD, PPU and COS. We only summarize variables for which relatively broad evidence exists, including data from *meta*-analyses, even though the evidence may differ in strength for the different types of addictive behaviors. Third, due to the heterogeneity of the included systematic reviews/*meta*-analyses, we could not conduct meta–*meta*-analyses of findings across reviews. Future research is needed to quantify the association between psychological risk factors and PSNU. Fourth, we conducted the systematic search of the literature in August 2024, and some recent systematic reviews are likely not included in this study. Finally, we investigated the "general" PSNU without differentiating between specific app-/platform-based behaviors, although some studies have shown that different apps/platforms differ in "addictive" potential (Rozgonjuk, Sindermann, Elhai, & Montag, 2021) and links with other psychological variables (Rozgonjuk, Sindermann, Elhai, & Montag, 2020). Moreover, exploratory graph analysis has shown that, in some cases, there are overlaps between symptoms of problematic use of specific apps/platforms, whereas, in some cases, there is no (strong)

overlap, challenging the "general" social media construct (Rozgonjuk, Sindermann, Elhai, Christensen, & Montag, 2020).

4.2. Conclusions

The current overview identified the psychological risk factors most consistently associated with PSNU, which were largely found to be linked to other problematic online behaviors as well. However, some specificities emerged that should direct future studies to investigate specific behavior- predisposing factors (such as needs and motives). Furthermore, most reviewed research included cross-sectional studies and general population samples, highlighting the necessity of on more longitudinal research, and a clear need for research conducted in clinical populations.

The current findings suggest intervention targets that may be valuable for preventing PSNU, like deficits in social skills, social anxiety and POSI. Finally, from a clinical perspective, identifying the specific motivations driving individual behaviors in the online environment, as well as understanding the role that online behavior plays for each individual, is essential for improving case formulation and developing tailored treatment strategies. In this vein, the personal core cognitions resulting in the decision to use SNs, like the beliefs about the usefulness of using SNs as a strategy for regulating negative emotions related to unmet social needs and obtaining social benefits, should be the focus of clinical interventions.

CRediT authorship contribution statement

Giulia Fioravanti: Writing – review & editing, Writing – original draft, Supervision, Methodology, Data curation, Conceptualization. **Sara Bocci Benucci:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation. **Simon Ghinassi:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.abrep.2025.100600.

Data availability

No data was used for the research described in the article.

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