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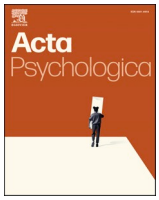

Toward a theoretically grounded preventive framework for Problematic Pornography Use: The *PPU-PrevFrame*☆

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ABSTRACT

A small proportion of pornography users experience problems to control this sexual behavior (i.e., "*Problematic Pornography Use*" [PPU]), leading to significant distress and functional impairment. Although several therapeutic interventions for PPU exist and have shown promising results, only a small proportion of affected individuals seek or access treatment. In this context, prevention of PPU (i.e., interventions designed to reduce the risk of PPU "*before*" the clinical picture emerges and leads to clinically significant impairment) is provided as a sound alternative. This paper introduces the "*PPU-PrevFrame*", a theoretically grounded, multi-component framework designed to guide universal, selective, and indicated prevention of PPU. This framework integrates strategies drawn from research on other addictive behaviors, tailoring them to the mechanisms underlying PPU. Universal prevention, as proposed by the "*PPU-PrevFrame*", focuses on comprehensive sexual education and pornography literacy delivered in sex-positive, developmentally appropriate formats. For individuals at elevated risk or displaying subthreshold symptoms, the "*PPU-PrevFrame*" incorporates additional components aimed at reducing vulnerability factors and interrupting escalation processes. These include increasing awareness of pornography use patterns and social norm interventions, educating about the "*addictive-by-design*" features of online pornography, strengthening internal regulation (self-control and self-regulation), implementing external control strategies, and promoting adaptive coping and emotion-regulation skills. The model also recommends periodic short-term abstinence periods, as well as other components that may be added when specific risk profiles require further support. In conclusion, the "*PPU-PrevFrame*" offers a theoretically grounded, flexible structure to guide the development of prevention programs that reduce PPU risk while respecting individuals' sexual agency.

1. Introduction

Pornography consumption has become an increasingly widespread sexual practice. A recent study comprising a representative sample of 8040 individuals found that between 85.5%–97.4% of men aged 12 to 85 years and between 21.3%–83.2% of women reported using pornography (Ballester-Arnal et al., 2023). People use pornography mostly for hedonic motives (e.g., to become sexually aroused and masturbate), for sexual curiosity, or as a way to explore their own sexual interests (Koós et al., 2024), in most cases without experiencing negative consequences derived from this sexual behavior. However, recent research shows that between 3.2%–16.6% of pornography users exhibit signs of "*Problematic Pornography Use (PPU)*" (Bőthe, Nagy, et al., 2024). PPU is characterized by a persistent inability to control pornography consumption, leading to a repetitive pattern of engagement in this behavior, which in turn results in a significant impairment across key areas of functioning and clinically relevant distress (Kraus et al., 2018). The consequences of PPU span multiple domains (e.g., reduced academic and job productivity, marital conflicts, family distress, or sexual dysfunctions, among others), leading to a substantial decline in quality of life and overall life satisfaction (Bőthe, Tóth-Király, et al., 2020). As a result, individuals struggling with PPU often require treatment to (re)gain control over their sexual

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behavior (Roza et al., 2024).

Several therapeutic approaches exist for treating PPU, including both psychological (Antons et al., 2022) and pharmacological (Borgogna et al., 2024) interventions. These treatments are aimed at reducing the intensity and severity of PPU when the dysfunctional consumption pattern is already established (i.e., in persons experiencing high levels of distress and seeking for professional help). However, there is a notable treatment gap, as only a small proportion of individuals with PPU actually seek professional help for this condition (between 4.3%–10.2%), and a substantial proportion of those who intend to do so (between 21%–37.1%) face barriers that lead them to desist from pursuing treatment (such as stigma or unaffordability) (Bőthe, Nagy, et al., 2024). Hence, even when available therapeutic approaches have shown promising results (López-Pinar et al., 2025), access to treatment for PPU, administered by qualified therapists, is not granted (Markert et al., 2023). In this context, prevention of PPU is provided as a sound alternative to therapeutic interventions. Preventive interventions are aimed to reduce the risk of developing an excessive and problematic consumption pattern "*before*" the clinical picture emerges and leads to clinically significant consequences. Despite its potential utility, there is a critical gap in research regarding the effectiveness of prevention approaches for PPU. Moreover, the few existing studies on PPU prevention have predominantly focused on educational approaches (i.e., "*pornography-literacy interventions*"), informing individuals about the risks associated with excessive pornography consumption as a means of reducing PPU risk (Testa et al., 2023). While educating individuals about the risks of PPU is an essential first step in prevention, information alone rarely translates into attitudinal changes, and even less into behavioral changes (Vahedi et al., 2018). This is particularly true when it comes to preventing addictive behavior,[1] a field in which information-based prevention programs have demonstrated limited utility (Soole et al., 2008; Volkow & Blanco, 2023). Consequently, there is an urgent need to design alternative prevention strategies and frameworks that complement educational interventions with other components more focused on skills development and enhancement of protective factors (Throuvala et al., 2018).

As highlighted by Gola and Potenza (2018), an essential aspect of developing comprehensive preventive approaches is identifying the vulnerability factors that increase individuals' susceptibility to developing PPU and their protective counterparts. Once these risk factors are identified, prevention efforts should incorporate targeted components aimed at reducing these specific risks and enhancing protective factors. In this work, we propose a theoretically grounded preventive framework, integrating multiple components, to reduce the risk of developing PPU by addressing its diverse underlying etiopathological mechanisms: the "*PPU-PrevFrame*". As many of the components of the PPU-PrevFrame are based on crosscutting observations of strategies that have been successfully implemented in the prevention of substance use disorders (SUDs) and other addictive disorders (e.g., gaming disorder, gambling disorder, or problematic social media use), this proposal is accompanied by a solid rationale justifying their use, and a critical analysis about whether these approaches could be effectively adapted to PPU prevention. The PPU-PrevFrame should not be understood as a specific intervention (i.e., a predefined set of sessions, delivered in a particular format, covering fixed contents, etc.), but rather as a conceptual framework intended to inform the design of programs that could be effective in preventing PPU.

2. The PPU-PrevFrame: a new preventive approach for PPU

Table 1 summarizes the main features of the PPU-PrevFrame. The overarching aim of this prevention framework is to mitigate vulnerability factors that may lead to PPU and to enhance protective factors (e.g., self-monitoring abilities, self-control, emotion regulation and coping skills, etc.). However, the methodological approach (i.e., the context and settings in which prevention occurs, the professionals involved in delivering the intervention, or the particular preventive components to be implemented) varies according to the level of risk of the target population. In particular, the PPU-PrevFrame distinguishes between universal, selective, and indicated PPU prevention, a classification commonly applied in the prevention of mental health conditions (Stockings et al., 2016) and addictive behaviors (both SUDs [Volkow & Blanco, 2023] and non-substance related addictive behaviors [King & Delfabbro, 2017; Thomas et al., 2024; Vondráčková & Gabrhelík, 2016]).

Universal prevention is considered beneficial for everyone and can be advocated confidently for the general public (Foxcroft, 2014). Consequently, universal preventive interventions target broad population groups (e.g., individuals within a specific age range or members of a particular community) that have not been identified on the basis of any individual risk factor. As evidenced before, almost the entire population has reported using pornography at some point in their lifetime (Ballester-Arnal et al., 2023). In addition, pornography has become one of the main ways in which certain population groups (mainly, adolescents and young adults) learn about sexuality (Litsou et al., 2021; Rothman et al., 2021). If these learnings occur in the absence of a comprehensive sexual education, pornography may have deleterious effects on different domains, both in adolescents (Peter & Valkenburg, 2016) and adults (Lim et al., 2016). These findings warrant the implementation of a universal PPU prevention approach targeting the largest possible proportion of the population (including adults), but particularly focused on adolescents and young people. Education settings (schools, universities, etc.) offer the potential to provide systematic evidence-based prevention of PPU to a large proportion of the youth population at a key developmental stage (when young people are conforming their "*sexual scripts*" [Braithwaite et al., 2015] and "*social norms*" about pornography consumption [Grigoropoulos, 2023]). Furthermore, education settings also let to deliver developmentally appropriate strategies, in a structured and familiar context, and targeted at different ages and year levels (Birrell et al., 2025). Therefore, in line with other authors' proposal (Crabbe & Flood, 2021; Planting-Bergloo & Orlander, 2024), the PPU-PrevFrame advocates for a school-based implementation. Workplace is another setting in which universal PPU prevention could be delivered, in this case targeting adult population. Supporting this approach, a recent meta-analysis concluded that the workplace is a promising setting for the implementation of preventive and early treatment interventions for supporting mental health in adults (Miguel et al., 2023). It is important to note that target populations for universal PPU prevention are not necessarily active pornography users: since the preventive strategies within this approach are primarily focused on educational aspects, pornography-naïve individuals may also benefit from a universal prevention approach. This preventive component should be ideally implemented within a more general sex-positive and pleasure-focused approach to sexual education, including other topics beyond the mere pornography consumption (McKee et al., 2026). Typically, pornography-literacy interventions have been implemented as a standalone intervention (Testa et al., 2023). Instead, the PPU-PrevFrame argues that its inclusion within a holistic approach to sexual education would provide a more balanced and integrated approach

[1] While the nosology and diagnostic classification of PPU has been the subject of longstanding debate (Castro-Calvo et al., 2022), many authors argue that this condition should be classified as an addictive disorder (Brand et al., 2021). The conceptualization of out-of-control sexual behavior in general and PPU in particular within an addiction framework has been discussed for decades (Orford, 1978), and emerging neurobiological and clinical data has further supported this view (Bőthe, Lonza, et al., 2020; Kowalewska et al., 2018; Stark et al., 2018). In the present work, the addiction framework is favored over alternative models because it provides a robust theoretical foundation for informing the design and development of the PPU-PrevFrame (Gola & Potenza, 2018).

Table 1
Overview of the PPU-PrevFrame.

	Universal prevention	Selective prevention	Indicated prevention
Target population	- General population (particularly, adolescents and young people). - Not necessarily active pornography users. - Without risk factors or symptoms of PPU.	- Individuals with risk factors for PPU. - Without symptoms of PPU.	-Individuals with subthreshold symptoms of PPU.
Prevention settings	- Educational settings (schools, universities, etc.). - Workplace (e.g., as a part of broader mental health programs).	- Educational settings (schools, universities, etc.). - Workplace (e.g., as a part of broader mental health programs). - Health services. - Social services.	
Professionals involved	- Health professionals with experience in sexual education - Trained professionals (e.g., teachers)-	-Mental health professionals (ideally, with experience in addictive behaviors).	

Preventive components	-Sexual education and pornography literacy.	- Sexual education and pornography literacy.
		- Addictive by design: design features that foster the risk of PPU.
		- Awareness of pornography consumption and its alignment with social norm.
		  - Self-monitoring of the pattern of pornography consumption.
		  - Correction of the misperception of the peer norm through a social norm intervention (SNI).
		- Internal control (self-control and self-regulation abilities).
		  - Mindful techniques (↓ desire).
		  - Avoiding triggers of pornography consumption (↓ desire).
		  - Distraction from the desire to use pornography (↓ desire).
		  - Imaginal retraining (↓ desire).
		  - Self-monitoring of the consequences of pornography consumption (↑ self-perceived conflict).
		  - Reminders of conflict (↑ self-perceived conflict).
		  - Balance between advantages/disadvantages of pornography use (↑ self-perceived conflict).
		  - Commitment devices (↑ motivation and volition).
		  - Publicly disclosure of behavioral intentions (↑ motivation and volition).
		- External control (external barriers to pornography overuse).
		  - Restrictions on the time per session devoted to pornography use.
		  - Restrictions on the frequency of pornography use per week.
		  - Restrictions on the specific time window for pornography access.
		- Emotion regulation strategies and adaptive coping skills.
		- Regular pornography abstinence periods (aka “pornography disconnections”).
		- Other potential preventive components (when indicated).
		  - Preventive components interventions aimed to boost self-esteem
		  - Preventive strategies to enhance interpersonal skills.
		  - Lifestyle interventions.
		  - Cognitive training (i.e., interventions aimed at automatic processes in addiction).	

to the multiple aspects that may impact on sexual development (Crabbe & Flood, 2021). Accordingly, the candidates to implement this type of prevention are health professionals with experience in sexual education or trained professionals capable of delivering such content (e.g., teachers in the case of school-based interventions [Nelson et al., 2025]).

Targeted prevention strategies are those specifically directed toward certain individuals and include both selective and indicated prevention (Birrell et al., 2025). Selective prevention targets subpopulations considered at higher risk for a disorder based on known risk factors, while indicated prevention is directed at those presenting symptoms of a disorder but not matching the criteria for the diagnosis of the condition (i.e., subthreshold or "*ghost*" syndromes) (Foxcroft, 2014). The PPU-PrevFrame methodological approach to selective and indicated PPU prevention is equivalent, as in both cases, the benefits of implementing a more comprehensive approach to PPU (i.e., preventing the onset of the first signs of pornography overuse or hindering that early signs of the condition evolves into a more severe clinical picture, respectively) exceeds the costs of its implementation. The complexity of these approaches lies in the criterion and procedure for the identification of the target populations for selective or indicated PPU prevention. In the case of selective prevention, Vondráčková and Gabrhelík (2016) enumerates a set of risk factors for addictive behaviors that are applicable to the identification of individuals at higher risk for PPU. The risk factors identified by Vondráčková and Gabrhelík (2016), together with others derived from studies examining the profile of individuals with PPU (Castro-Calvo et al., 2020; Efrati et al., 2022; Zilberman et al., 2018), include: (a) psychopathological factors (ADHD, depressive or anxiety disorders, SUDs, or other addiction symptoms); (b) personality characteristics (impulsivity, novelty seeking, neuroticism, hostility, low conscientiousness and agreeableness, emotional instability, low self-regulation, insecure attachment, and low self-control); (c) sociodemographic factors (men, younger age); (d) sexual profile (higher sexual sensation seeking and erotophilia); (e) pattern of pornography use (higher frequency of pornography use, consumption of more extreme contents, etc.); (f) psychological state (stress, low self-esteem and self-concept), and (g) social factors (loneliness, low relationship satisfaction, etc.). Individuals with these characteristics are target candidates for selective PPU prevention. On the other hand, the identification of candidates for indicated PPU prevention requires the use of screening scales capable of identifying individuals with subthreshold symptoms of PPU (e.g., the PPCS-18 or its abbreviated version [Bőthe, Nagy, et al., 2024]). After the administration of a screening scale, individuals scoring close to the clinical cut-off may be considered a candidate for indicated prevention. This approach closely resembles the one used by Lindenberg et al. (2020) in the PROTECT program for the identification of young people with subclinical symptoms of gaming disorder or problematic Internet use.

One of the strengths of the PPU-PrevFrame is its ability to tailor preventive strategies to the risk level of the target population, particularly with respect to the selection of the preventive components to be implemented. The PPU-PrevFrame proposes a low-intensity pornography literacy intervention for universal PPU prevention, and a high-intensity, multi-component intervention for selective and indicated PPU prevention. In broad population groups that are not identified on the basis of individual risk factors (i.e., universal PPU prevention), the time and resources required to implement a multi-component approach clearly outweigh its potential benefits. Therefore, the PPU-PrevFrame advocates for a pornography literacy intervention for universal PPU prevention rather than for a multi-component intervention, which is reserved for selective and indicated PPU prevention. Given the centrality of the preventive components that make up the PPU-PrevFrame, the following sections provide a detailed explanation of the rationale underlying each component, along with an analysis of how it could be effectively designed to target PPU.

2.1. Components making up the PPU-PrevFrame

2.1.1. Sexual education and pornography literacy

Justification. Pornography literacy interventions are central to preventing negative consequences associated with pornography use among individuals lacking adequate sexual education, particularly adolescents (Testa et al., 2023). These interventions are not designed to limit the quantity or regulate the patterns of pornography consumption, but rather to foster critical thinking skills that empower young people to engage with pornography in an informed and reflective manner, thereby lessening its potential adverse effects (Rothman et al., 2018). In other words, these interventions are meant to prevent certain sequela that have been sometimes linked to pornography use (such as developing more permissive attitudes toward casual sex, earlier age of sexual debut, greater endorsement of traditional gender norms, or more risk of harassment and sexual assault perpetration [Peter & Valkenburg, 2016]), but not to prevent PPU. Using a longitudinal research design, Vandenbosch and van Oosten (2017) demonstrated that adolescents and young people who learned about pornography in the school were protected against the adverse effects of exposure to sexually explicit contents on views of women as sex objects (i.e., sexual objectification). Similarly, Rothman et al. (2018) found that a 5-session pornography literacy intervention in adolescents increased pornography-related knowledge, and resulted in changes at an attitudinal level (e.g., participants were more likely to recognize that pornography may produce unhealthy expectations) and in terms of behavioral intentions (e.g., to ask for advice in case of needing help due to pornography overuse). However, this intervention failed to have a direct impact on pornography-related behavioral patterns, meaning that while pornography literacy constitutes a "*necessary first step in the prevention of PPU*", these interventions alone are limited when it comes to reducing the actual risk of PPU. Thus, the PPU-PrevFrame proposes pornography literacy as the unique component of universal PPU prevention with beneficial effects at a community level (particularly, among children and adolescents), as well as the first component of a broader prevention initiative in the case of selective and indicated PPU prevention. An interesting finding from the study by Rothman et al. (2018) was that the administration of a pornography literacy intervention did not encourage pornography-naïve youth to seek out pornography for the first time, a common concern among families and authorities that often preclude them from permitting children and adolescents to participate in these literacy classes.

Description of the preventive component. Brief, unsupervised pornography literacy interventions seem to have no impact on sexual knowledge, attitudes, or behaviors (Thomas & Buijzen, 2025). In other words, not all approaches are effective when addressing pornography literacy, and careful attention should be given to designing interventions that maximize their effectiveness. Over the past five years, different practice frameworks have been developed to assist in the design of pornography literacy interventions (Crabbe & Flood, 2021; Dawson et al., 2020). Basic premises when designing these educational interventions are: (a) pornography literacy should provide "*evidence-based information*" (it is crucial to avoid moral approaches relying on biased analyses of the extant literature, such as those programs only presenting the negative consequences of pornography consumption and ignoring possible positive effects on some youth); (b) should create an atmosphere free of judgment, safe, and confidential; (c) should be equally engaging for youth who had seen and had not seen pornography (NB: if these educational interventions are implemented as a school-based universal prevention, a proportion around 2.7–21.7% of the target population would be children and adolescents without previous experience with pornography [Ballester-Arnal et al., 2023]); (d) should be tailored to the particular target population (in response to communities' cultural or religious profiles) while keeping program fidelity (in terms of contents to be addressed); (e) should be age-appropriate; (f) should be participatory; and (g) should be delivered by skilled staff (Crabbe &

Flood, 2021; Rothman et al., 2018). Although some have argued that young people in schools should be shown pornography to learn what sexually excites them and how they respond to various sexual stimuli (Simon et al., 2015) or to taught them to critique pornography, the current social and political environment (with traditionalists and anti-pornography movements rising in popularity during the last years [Perry & Mcelroy, 2022]) makes this approach unfeasible; instead, as others have done before (Crabbe & Flood, 2021), the PPU-PrevFrame suggests to avoid the use of sexually explicit content during pornography literacy interventions while keeping a sex-positive approach. A positive and pleasure-focused approach to pornography literacy implies the affirmation of young people's sexual agency, rejection of fear and shame-based approaches, the destigmatisation of masturbation, spotlighting the "orgasm gap", and taking care to avoid alienating individuals who are active consumers of pornography (Crabbe & Flood, 2021; McKee et al., 2026).

In terms of contents, recent works suggest that a comprehensive pornography literacy approach should address the following topics: (1) the realities of sex in pornography vs. real world; (2) potential harms derived from pornography consumption; (3) the role of pornography as an educator; (4) the risk of developing a pattern of PPU; (5) pornography and norms related to gender and sex; (6) sexual communication and consent in pornography vs. real world; (7) self-pleasure, partnered-pleasure, and orgasm; (8) "orgasm gap" and the patriarchal base of pornography; (9) challenging the dominance of phallocentric narratives; (10) sexual and gender violence in pornography; (11) pornography and sexual exploitation; (12) shame, acceptance, and stigma around pornography; (13) body and genital image comparisons; and (14) the sexualized and fetishized (mis)representation of LGBTQ+ community in porn (Dawson et al., 2020; McKee et al., 2026; Testa et al., 2023).

As pornography literacy interventions should be implemented following a sex-positive and pleasure-focused approach, the PPU-PrevFrame advocates for educating about the benefits of "*ethical pornography*" over traditional mainstream pornography[2] (which has been criticized for exploitative labor conditions, inadequate performer's consent, violent and phallocentric content, etc. [Miller & McBain, 2022; Vera-Gray et al., 2021]). Ethical pornography refers to sexually explicit media produced according to standards that prioritize the autonomy, safety, and well-being, along with transparency and fairness in production practices (Burke, 2023). Unlike mainstream pornography, ethical pornography seeks to establish an ethical framework across its entire production chain: this includes informed, ongoing, and enthusiastic consent, equitable compensation, safe working environments, and the ability for performers to exercise meaningful agency over their roles, boundaries, and working conditions. Ethical pornography also tends to emphasize realistic sexual expression, diversity in bodies, identities, and sexual orientations, as well as the avoidance of deceptive or coercive production practices. As a result, consumption of ethical pornography –instead of traditional mainstream contents– has the potential to reduce the moral incongruence that many users of sexually explicit contents experience when consuming contents that are not aligned with their ethical or moral values regarding gender, sexual consent, or sexual practices (Grubbs et al., 2019).

2.1.2. Addictive by design: design features that foster the risk of PPU

Justification. By design, specific structural characteristics of web-based services and applications might promote overuse, thereby facilitating the onset and maintenance of risky and problematic engagement. This is particularly evident in online gambling, where multiple studies have demonstrated that features engineered within modern online slot machines and betting services (e.g., random-ratio reward schedules, free bets, near-misses, or cash-out opportunities) amplify their addictive potential and contribute to increasing gambling-related harms (Delfabbro et al., 2023; Palmer et al., 2024; Sinclair et al., 2024). The examination of the characteristics and design features behind the "*addictiveness*" of gambling has a long history, but more recently, efforts have been made to disentangle the mechanisms that facilitate loss of control over other online behaviors. In particular, researchers have identified a set of distinctive design features that promote overengagement in videogaming, shopping, social networking, on-demand streaming services, and pornography use (Flayelle et al., 2023, 2025). Most users are not aware of how these structural characteristics and design features manipulates their online behavior and have the potential to induce dysregulated use, but it seems that providing insights into this mechanism may decrease their addictive potential. Thereby, some researchers have suggested that uncovering the influence of design features in promoting technology overuse may constitute an effective approach for the prevention of addictive behavior (Flayelle et al., 2023). This assumption is based on the notion that a greater awareness of these features may allow individuals to deploy self-control strategies in response to these "addictive per design" features, thereby minimizing the risk of addictive engagement. Supporting this view, Navas et al. (2023) found that two preventive approaches –both focused on increasing awareness of the structural characteristics and design features of gambling– were effective in reducing positive attitudes toward gambling and future gambling intention in children and adolescents in general, as well as gambling severity, frequency, and money invested among those who reported having gambled. These findings were replicated in a subsequent study (Martín-Pérez et al., 2025). For that reason, incorporating a component designed to enhance awareness of the design features that promote excessive pornography use may minimize the risk of addictive engagement and, consequently, may represent a valuable strategy for the prevention of PPU.

Description of the preventive component. Online pornography users are more likely to develop risky consumption patterns, compared to those who use it offline (Wéry et al., 2016). Seminal theories, such as the «Triple A Model» (Cooper, 1998), have attributed this increased risk of over-engagement to the *Anonymity*, *Affordability*, and *Accessibility* of pornography on the Internet: compared to its offline counterpart, online pornography offers a unique space for overuse due to the easy access to sexually explicit content, the privacy facilitated by its use from personal devices in places where intimacy is warranted, and the free –or low cost– availability of most contents (Grubbs et al., 2020). In addition to these structural characteristics, different studies have identified a set of design features contributing to the addictive potential of online pornography. Keilty (2018) examined the strategies employed by the pornographic industry to increase "time-on-site", and concluded that, by designing an immersive viewing experience, pornographic websites aim to subtle persuade viewers into engaging in a continuous search for an "*imagined perfect image*" (i.e., the mental construction of an idealized sexual stimulus that pornography can never fully satisfy). To do so, pornographic websites conceal complex design technologies beneath an amateurish appearance. One of these technologies is the "*search by categories*": this function allows users to search for videos categorized under specific tags, thereby tailoring the content to their sexual preferences (Mazières et al., 2014). The implementation of increasingly complex algorithms and the continuous collection of browsing data have led to an even more powerful function: "*personalized suggestions*" based on users' previous searches on the site (Flayelle et al., 2023). Importantly, these features are possible thanks to an enormous catalogue of sexual content. The "*thumbnail preview*" of the pornographic content in the main page promotes infinite scrolling, another strategy to keep users in a continuous search of the perfect content. Together with this function, the possibility to jump between multiple tabs (or "*tab-jumping*" [Ince et al., 2024]) induces overuse in a subtle, disguised way.

[2] The PPU-PrevFrame is not intended to promote ethical pornography consumption, but to offer traditional mainstream pornography consumers an alternative that enables them to exercise their right to sexual agency and sexual pleasure without being exposed to content depicting questionable sexual practices or produced under abusive working conditions.

While the structural characteristics of online pornography are inherent to the medium, certain underlying assumptions –such as the "*absolute anonymity*" often attributed to Internet use– can be critically examined. Challenging this belief by illustrating the various mechanisms through which online identities can be revealed (e.g., tracing IP addresses linked to usernames, connecting personal information to publicly available online data, or exploiting security breaches derived from hacking or malware attacks [Ederer et al., 2024; Sardá et al., 2019]) may help to reduce the perceived sense of total anonymity. Similarly, educating pornography users about the design features intended to increase "time-on-site", ideally through a combination of expository instruction and practical, interactive activities (Navas et al., 2023), may enhance their awareness of these manipulations and help them implement self-regulation strategies (such as limiting themselves to opening only one or two tabs instead of engaging in a persistent search for the "*ideal*" sexual content).

2.1.3. Awareness of pornography consumption and its alignment with social norm

Justification. Numerous studies suggest that people do not report accurately on their own behavioral patterns (e.g., frequency of physical activity, bedtime, smoking habits, etc.), and this is particularly true for their screen time (Hodes & Thomas, 2021). A solid corpus of evidence demonstrates that individuals systematically underestimate the time spent online, as evidenced when studies compare self-report estimates and objective data derived from log-based measures (Parry et al., 2021). This underestimation of the personal involvement in online activities is often accompanied by misperceptions of peers' behavior, typically overestimating the frequency of the others' engagement (Robertson et al., 2024). As a result, many individuals with a persistent engagement in an online behavior and experiencing incipient signs of loss of control believe that their own behavior aligns with (or even falls below) the social norm, which may increase their vulnerability to developing problematic engagement patterns (Angelini et al., 2024; Hong et al., 2021). Taken together, these findings justify why most current approaches to the prevention of addictive behavior include components aimed at promoting self-monitoring skills and implementing social norm interventions (SNIs) (King et al., 2018; Lemmel & Morina, 2024; Thomas et al., 2024; Vondráčková & Gabrhelík, 2016).

In the realm of pornography, no studies have yet compared self-reported consumption time with data derived from objective logged measurements. However, recent findings suggest that pornography use may also distort time perception and result in the underestimation of time spent watching these contents. Under controlled experimental conditions, Cervigón-Carrasco et al. (2023) found that the exposition to sexually explicit contents altered time estimation (leading to the underestimation of the duration of pornography consumption episodes) and subjective perception of time passage (perceiving these episodes as flying by). Similarly, observations derived from qualitative studies suggest that pornography users tend to report phenomenological experiences of dissociation and trance-like states characterized by losing track of time during consumption episodes (Chaney & Dew, 2003; Ince et al., 2023). As is the case for addictive behaviors, this underestimation of the time spent using pornography occurs together with misperceptions of peers' consumption. Bleakley et al. (2011) found that pornography consumption is strongly influenced by social norm and normative pressure (i.e., perceptions about what others think and do with regards to pornography consumption). Individuals who believe that "*everybody is using porn*" are more likely to hold a positive attitude toward pornography (Grigoropoulos, 2023), whereas those who overestimate others' engagement (e.g., "*people use pornography more often than I do*") may be more prone to experience an increased risk for PPU. It seems justifiable, then, that preventive approaches targeting individuals at risk for PPU implement components aimed at increasing awareness of time spent using pornography and SNIs targeting misperceptions of the peer norm.

Description of the preventive component. Self-monitoring is essential to enhance awareness of someone's pornography consumption pattern. Self-monitoring, briefly defined as the act of observing ones' own behavior, may be as simple as tracking the outcome of interest (e.g., the time spent using pornography or the nature of the sexually explicit content consumed) or can be much more complex (such as identifying the precipitants of pornography consumption or the internal [feelings, cravings] and external [places, hours] context in which the behavior occurs) (Gass et al., 2021). The more information individuals self-monitor, the greater their awareness of their own pattern of pornography consumption. Within the context of the PPU-PrevFrame, self-monitoring the time spent using pornography may be sufficient for the effective prevention of PPU. When self-monitoring this particular outcome, it is important to distinguishing between time using pornography during free or leisure time and the time using pornography instead of fulfilling responsibilities, as recent studies in the context of gaming disorder demonstrate that the latter is a more robust proxy of problematic engagement (Stevens et al., 2025). The modality of monitoring can also vary, with traditional options including retrospective call or daily paper diaries (Gass et al., 2021). However, as pornography use occurs online, the PPU-PrevFrame recommends using digital methods instead (de Vries et al., 2021). A wide range of apps currently enable individuals to maintain a daily record of their own behavioral pattern (see Gansner et al., 2020 for an example on problematic internet use). Through this approach, we can either record the time devoted to pornography consumption each time it occurs or asking individuals to report their pornography consumption based on a time schedule (Shiffman et al., 2008).

Together with self-monitoring, implementing a SNI aimed at correcting (mis)perception of the peer norm about pornography consumption may reduce the risk of PPU. SNIs have become increasingly popular over the past two decades as a simple and cost-effective approach to the prevention of addictive behavior (Lemmel & Morina, 2024). SNIs work by closing the gap between "*what people perceive to be the norm*" and the "*actual norm*" (Papakonstantinou et al., 2025): when there is a (mis)alignment between perceived and actual norm (as is often the case for pornography use), giving information –"*social norm messages*"– about what is normative may lead to a behavior change. For instance, if someone overestimates their peers' pornography use, providing information about the average frequency may prompt a critical appraisal of their own engagement and potentially reduce the amount of pornography that is consumed. This is the rationale behind the inclusion of a SNI as a part of the PPU-PrevFrame. Following the procedure suggested by Thomas et al. (2024) for risky buying behavior, a SNI focused on preventing PPU may be implemented through a four-step approach: (1) monitoring the own time spent using pornography (see the previous paragraph), (2) examining perceived norm ("*how much time do you think that people typically spent using pornography?*"), (3) comparing perceived and actual norm (e.g., comparing perceptions about pornography use with actual data [a social norm message] about the average time spent using pornography at a community level), and (4) comparing own time spent using pornography and actual norm (to what extent your own pornography consumption adheres to the actual norm).

2.1.4. Internal control (self-control and self-regulation abilities)

Justification. The core clinical feature that characterizes individuals with PPU is the lack of control over their pornography use (Kraus et al., 2018). From a process-based perspective, Perales et al. (2020) proposed that "*the addictive process can be defined as a transition between behavioral control modes*" (p. 772), a shift from a "*model-based*" to a "*model-free*" control from the potentially addictive behavior (O'Doherty et al., 2017). In other words, a progressive transition from a full intentional control over the behavior to a complete impaired control (Perales et al., 2020). This lack of control over pornography use may take the form of either impulsive or compulsive behavior (Gaudet et al., 2025). Impulsivity

refers to the experience of being "*driven*" to act spontaneously in reaction to the presence of a rewarding stimulus, overestimating positive outcome expectancies and underestimating potential harmful consequences, whereas compulsivity refers to the experience of being "*forced*" or "*compelled*" to act despite related negative consequences (Yücel et al., 2019). Therefore, the key distinction between impulsivity and compulsivity lies in the motivational processes underlying the behavior (reward-driven or gratification vs. rule-bound or compensation) (Bothe et al., 2022). During the early stages of addiction, impulsivity tends to play a more central role, whereas compulsivity becomes more prominent as the addiction progresses (Brand, Antons, et al., 2025; Brand, Müller, et al., 2025).

Researchers have proposed that this dynamic transition from a full control to a complete impaired control over pornography use may constitute a central component when it comes to explaining the initiation and maintenance of PPU (Castro-Calvo et al., 2022). Should this transition often occurs insidiously over years (Castro-Calvo et al., 2023), control over pornography use may be expressed along a continuum of severity, in which a clinical diagnosis of PPU may represent the upper end of the continuum. Individuals struggling with already established problems to control their pornography use often require intensive psychiatric and/or psychological treatments to gain control over their sexual behavior (e.g., Stark et al., 2024). However, until arriving at a level of severity to consider that the pattern of pornography use has become "*compulsive*", individuals would start to experience increasing problems to control their pornography use and progressively decreasing self-regulation abilities. In this context, the implementation of preventive interventions (selective or indicated) aimed to promote self-control and self-regulation abilities and skills are warranted (Büsche et al., 2022), as these components may prevent the transition from incipient signs of loss of control to a clinical picture of PPU (Brevers & Turel, 2019).

Description of the preventive component. Broadly defined, self-control implies the ability to inhibit certain impulses in favor of long-term advantageous outcomes (Inzlicht et al., 2021). Relying on this definition, Büsche et al. (2022) suggested that, in the context of PPU, self-control implies refraining from the short-term rewards derived from pornography use (such as pleasure or mood regulation) when the engagement in this activity is linked to long-term negative consequences. At an experimental level, studies using delay discounting tasks have demonstrated that individuals with PPU show preferences for short-term small gains rather than long-term large gains (Castro-Calvo et al., 2021). Impaired sexual delay discounting appears to be relevant when it comes to explaining out-of-control sexual behavior and PPU in both men and women, but particularly in the latter group (Finkenstaedt et al., 2025). Similarly, studies exploring other self-control abilities through multiple experimental paradigms demonstrate that self-regulation problems are common features across multiple Internet use disorders, including PPU (Müller et al., 2025). Several models and theories has been proposed to explain how self-regulation works (for a review, see Inzlicht et al., 2021), but only a few provide useful insights for the development of therapeutic components or preventive programs aimed to increase self-control abilities. One exception is the Preventive-Interventive Model of Self-Control (PI-Model) (Hofmann & Kotabe, 2012). This clinically-oriented theoretical framework model distinguishes between preventive (i.e., anticipatory) and interventive (i.e., momentary) forms of self-control, proposing mechanisms through which people may be able to proactively boost self-control success before experiencing self-regulation problems (Hofmann & Kotabe, 2012). Preventive self-control comprises a collection of strategies that may help individuals to avoid situations in which the problematic behavior (in our case, PPU) may arise. In the PPU-PrevFrame, we rely on the PI-Model, as applied by Büsche et al. (2022) to PPU, as the theoretical framework informing our proposal of strategies aimed to increase self-control and self-regulation abilities for the prevention of PPU. Each strategy is allocated in a particular phase of the self-control process:

(a) 1st Phase (Desire): Experiencing desire "*for*" or "*to do*" something motivates behavior, and therefore, constitutes the first phase of the self-control process (Hofmann & Kotabe, 2012). In brief, desire is the "*feeling of wanting*" (Hofmann et al., 2012, p. 1318). The PI-Model suggests that without desire, there is no room for self-control problems; on the contrary, a strong desire increases the likelihood of experiencing self-control and self-regulation problems. In addiction research, the extreme desire for something (e.g., a drug) or to do something (using pornography) is often referred to as "*craving*" (Tiffany & Wray, 2012). In the field of PPU, craving for pornography has been identified as the realm in which self-control problems take place (Way & Kraus, 2024). As a result, any preventive strategy oriented to reduce the desire for pornography may be useful to boost self-control since a very initial phase of the self-regulation process.

One strategy used to manage craving in SUDs and other addictive disorders is mindfulness (Demina et al., 2023). Mindfulness interventions aimed to reduce craving comprise exercises designed to promote awareness of bodily sensations, to develop an attitude of acceptance toward the desire, or to help individuals see themselves as separate from their thoughts and emotions (Tapper, 2017). The beneficial effects from these techniques when it comes to reducing craving stem from different underlying processes, including the interruption of craving related elaboration or the extinction process that results from inhibiting the craving related behavior (Tapper, 2018). Avoiding triggers of pornography consumption constitute another useful strategy to reduce craving (Büsche et al., 2022). As craving for pornography is often elicited by identifiable internal (e.g., being bored or experiencing a dysphoric mood state [Castro-Calvo et al., 2018]) or external cues (e.g., being alone in front of the personal computer), instructing people to recognize, anticipate, and –if possible– avoid situations in which they would experience desire to engage in pornography use may reduce the likelihood of doing so. As some of these situations are often unavoidable, sometimes the focus should be on increasing awareness of the trigger and implementing alternative responses instead of using pornography. Similarly, sex research has shown that sexual arousal to erotic cues can be reduced through the use of subjective control via distraction from the cues (Koukounas & Over, 2001). Distraction, cognitive avoidance, or attention-switching techniques have been successfully used to manage craving in different SUDs and other addictive disorders (e.g., smoking, alcohol abuse, or food addiction [Ashe et al., 2015; Dicker et al., 2016; Forman et al., 2007; Koukounas et al., 2019]). Finally, a recent study showed promising results derived from the use of imaginal retraining as a low-threshold self-help intervention to reduce approach tendencies to pornography and craving (Baumeister et al., 2024). The implementation of these strategies, even in individuals that still preserve certain levels of control over their pornography use, may constitute useful components to increase self-control.

(b) 2nd Phase (Conflict): Desire to use pornography becomes a problem when it is at odds with a person's goals, value system, or wellbeing (Hofmann & Kotabe, 2012). In other words, when someone desires to use pornography but, simultaneously, has a reason not to do so (e.g., because doing so may increase their couple problems or reduce academic productivity), conflict arises. In this context, the perception of conflict is the trigger for self-control attempts. Accordingly, increasing self-perception of conflict is important to promoting self-control (Hofmann & Kotabe, 2012).

To increase self-perception of conflict, Büsche et al. (2022) proposed two strategies: increasing monitoring competencies and installing reminders of conflict. In a section before, we have elaborated on the centrality of self-monitoring to increase the

awareness of the own pornography consumption. Self-Monitoring has been used in the treatment of SUDs to bring conscious awareness of the consequences of the substance use (Gass et al., 2021), so implementing abilities to track the consequences of pornography use, may be useful to increase self-perceived conflict. Similarly, using reminders of conflict (e.g., the picture of a happy moment with a couple in the computer desktop or a brief motivational sentence in a post-it near the computer) may serve as a reminder of the consequences of persisting in the behavior (Hofmann & Kotabe, 2012). In addition, it may be useful to ask participants to engage in a fair balance of the advantages and disadvantages of their pornography use. If the "scale" tips in favor of the disadvantages (typical when people experience initial problems derived from their pornography consumption), the person develops solid personal reasons to stop using pornography. Ballester-arnal et al. (2020) reported using this approach in the treatment of patients with cybersex addiction as a way to promote readiness to change and treatment adherence. Even when these techniques have not been tested in individuals with subthreshold levels of PPU, we believe that they would constitute a useful resource for the prevention of this condition.

(c) 3rd Phase (Control motivation and volition): The third phase of the self-control process distinguishes between motivational and volitional weaknesses of willpower (Kalis et al., 2008). When people are aware of the conflict derived from their pornography use, self-control attempts may fail because their intention to resist the desire is not strong enough (motivational weakness) or because they do not have enough willpower to stick to their intentions (volitional weakness). One potential mechanism contributing to this reduced motivation and volition is "*cognitive abeyance*": cognitive abeyance appears during heightened states of sexual arousal and refers to "*a state of inactivity, deferment, suspension, or diminution of logical cognitive processing*" (Walton et al., 2017, p. 2243). When in high states of sexual arousal, people usually struggle to appropriately consider their pornography use, downplaying its negative consequences, anticipating exaggerated positive rewards (Draps et al., 2021), and developing justifications that allow violations of the goal they endorse (e.g., "*I deserve to use pornography because I've already gone one week without doing so*") (Huberts et al., 2014).

A series of techniques aimed at generating an intentional process of committing to long-term goals and eliminating tempting alternatives are advised to avoid motivational and volitional weakness (Trope & Fishbach, 2005). These techniques include: the use of "commitment devices" and public disclosure of behavioral intentions (Hofmann & Kotabe, 2012). Commitment device is an umbrella term that comprises any technique aimed at helping people commit to particular outcomes (Coupe et al., 2019). Behavioral contracts has been successfully employed to reduce unhealthy behaviors (Rogers et al., 2014), including SUDs (Bickel et al., 2014). Behavioral contracts increase long-term commitment by rewarding sticking to one's goal (e.g., the reduction of pornography consumption) and punishing giving in to temptation through pre-arranged penalties. Another way to make it harder to disengage from self-control is the public disclosure of behavioral intentions (Gollwitzer et al., 2009). When someone shares their goals with a close other (e.g., the intention to reduce pornography consumption), anticipated disapproval from others may act as a reinforcer and increase commitment (Klein et al., 2020). This approach, however, should be carefully implemented, as recent studies demonstrate that when people publicly share their goals, they are more likely to engage in deceptive behaviors (Hou & Meng, 2025).

2.1.5. External control (external barriers to pornography overuse)

Justification. Unlike the previous preventive component (which is aimed at promoting "*internal*" control), the use of external barriers outside people's control to keep them away from pornography pursues the implementation of an "*external*" control over the behavior (Lim & Weissmann, 2023). The utility of this approach relies on the fact that creating opportunity constraints is the consequence of a person deliberate decision in a "*cool state*" (Hofmann & Kotabe, 2012): when someone anticipates difficulties in resisting the urge to use pornography for more time than intended while sexually aroused (i.e., when faced with the "*temptation*" in a "*hot state*"), creating opportunity constraints in advance may reduce the likelihood of engaging excessively in the behavior. There is a wide consensus that internal control is preferable over external control, in particular when it comes to preventing addictive behaviors (Soravia et al., 2015). However, in the absence of enough self-control abilities to resist the temptation to use pornography (or parallel to self-control efforts), external control seems preferable to behavior enactment (Büsche et al., 2022).

An historical example of opportunity constraint is the Leonid Brezhnev's time-lock cigarette case, a device programed to dispense only one cigarette per hour as a way to control excessive smoking habit (Hofmann & Kotabe, 2012). More recent examples entail the increasing popularity of content filters to help users limit the time spent on the Internet and prevent internet use disorders (Lee et al., 2019), particularly excessive social media use and gaming (Mhavan & Singh, 2026). However, constraining opportunities through restrictive technology appears to be effective when blockers and filters are implemented by the users themselves, and in parallel with their own self-control efforts. When access restrictions are imposed by third parties (e.g., parents or legal guardians, couples, or even governments), the utility of constraining opportunities is limited due to users' ability to circumvent filtering systems (Przybylski et al., 2017). This explains why parental control solutions (i.e., digital tools that grant parents to observe their children's digital usage and to intervene through time restrictions, content blocking, or usage controls [Stoilova et al., 2024]) tend to be ineffectual when implemented without granting opportunities for self-regulation (Gnanasekaran & De Moor, 2025). Another example of "*controversial*" approach to opportunity constrains and external control is the Chinese gaming prevention policy. The Chinese government has developed strict national policies aimed at restricting the hours of minors' access to Internet gaming services at a population level (King et al., 2018). This approach has been extensively criticized for ignoring the multiple pathways that lead to excessive gaming, the balance between protection and violation of individuals' right to gaming (Colder-Carras et al., 2021) and, even more important, the results from previous experimental studies evidencing that these measures could be ineffectual or even counterproductive (Davies & Blake, 2016). A recent study testing how this Chinese gaming policy impacted on gaming patters demonstrated that a percentage of adolescents found the way to violate the restriction (e.g., using family member's identity), and most of them engaged in "*compensation behaviors*" during the periods of forced abstinence from gaming (such as watching short videos) (Zhou et al., 2024). Against this background, the PPU-PrevFrame proposes implementing restrictive technology as part of a broader set of measures, alongside components focused on promoting self-control (see previous section), and by conceptualizing filters and blockers as "aids to self-regulation", rather than as external restrictions imposed by third parties (meaning that participants in the prevention program should be directly involved in the implementation, configuration, and maintenance of their own filters).

Description of the preventive component. External control works by curtailing access to pornography through restrictive technology (mainly, content filters) (Turvey et al., 2024). The first generation of content filters had limited functionalities, in most cases directly banning

pornography consumption and overblocking legitimate content (e.g., information about sexual health, relationships, or sexual identity) (Przybylski & Nash, 2017). Furthermore, these filters were easily bypassed by people with an average digital literacy, particularly young people (Davis et al., 2021). The new generation of content filters, however, enables more sophisticated features, such as restricting the time spent on pornography, defining specific time window for access (e.g., prohibiting use during nighttime), monitoring usage patterns and generating regular reports (such as summarizing the time spent watching pornography compared to previous months), or by delivering educational messages (Turvey et al., 2024). Taking advantage of these new functionalities, the PPU-PrevFrame proposes setting up a content filter that: (a) restricts the time per session devoted to pornography use (~11 min) and (b) the frequency of pornography use per week (≤2 time). Fitting these recommendations would mean that the pattern of pornography use would be equivalent to those displayed by individuals without PPU (Bőthe, Nagy, et al., 2024), thus avoiding the typical features that lead to the escalation in the severity of the behavior (such as the engagement in "pornographic binges", "tab-jumping", or "edging" [Ince et al., 2024; Wordecha et al., 2018]). In line with previous recommendations, the content used during these predefined sessions of regulated consumption should ideally consist of ethical pornography (Burke, 2023); using such content instead of mainstream pornography may also contribute to reducing the likelihood of overuse. Moreover, the restriction on the specific time window for pornography access to daytime would avoid the sleep problems experimented by people with increasing problems to control their pornography use (Musetti et al., 2022; Noel et al., 2025).

2.1.6. Emotion regulation strategies and adaptive coping skills

Justification. A common criterion used for the characterization and diagnosis of out-of-control sexual behavior is the use of sex as a coping mechanism (Kafka, 2010, 2013). Clinical observations suggest that most persons with PPU repetitively engage in this sexual activity in response to dysphoric mood states or to stressful life events, sustaining the view that this condition operates as a dysfunctional emotional regulation strategy to cope with psychological distress (Wéry et al., 2016). At an empirical level, different studies support the relevance of the use of pornography as a maladaptive coping strategy in individuals with out-of-control sexual behavior (Lew-Starowicz et al., 2020) and PPU (Bőthe, Lonza, et al., 2020). Integrating findings from different studies, three works demonstrate that out-of-control sexual behavior and PPU are strongly linked to depression (Schultz et al., 2014), anxiety (Grant Weinandy et al., 2023), and loneliness (Mestre-Bach & Potenza, 2023). Similarly, recent research using machine learning found that emotional avoidance (Bőthe, Vaillancourt-Morel, et al., 2024) and suppression of negative emotions through pornography (Ben Brahim et al., 2024) are robust predictor of PPU.

The I-PACE model for addictive behaviors (Brand et al., 2019) provides a potential explanation for the nexus between emotional distress and the increased likelihood of PPU. Considering PPU through this model, it is possible to posit that at early stages of the addiction cycle, pornography may lead to feelings of gratification or relief from negative emotional states. As the addiction process evolves, users "*learn*" that pornography constitutes an effective coping style, generalizing the expectancy that engagement in this activity is helpful for dealing with distressing emotions in daily life. When pornography becomes the only –or the most efficient– strategy to reduce emotional discomfort, this behavior grows more likely to become dysregulated and problematic. This process, also known as "*relative outcome utility*" (i.e., the efficiency of a certain behavior for obtaining positive or negative reinforcement, compared to alternative and more adaptive coping behaviors [Perales et al., 2020]), may be central when it comes to explaining the onset and maintenance of PPU (Castro-Calvo et al., 2022). When the pattern of PPU is already established, persons with this condition may turn to pornography as the preferred way to cope with distress, thereby requiring structured psychological interventions to manage their emotions in healthier ways (Lew-Starowicz et al., 2020). However, during the escalation process that precedes the establishment of the clinical condition (Ince et al., 2024), individuals at risk of developing PPU are expected to retain certain coping and emotional self-regulation skills. In this context, the implementation of selective or indicated preventive strategies aimed at strengthening adaptive coping skills and emotion-regulation abilities are warranted, as these components may reduce the likelihood that early signs of emotion dysregulation linked to pornography use evolve into a clinical picture of PPU.

Description of the preventive component. The promotion of emotion regulation and adaptive coping skills is a cross-cutting objective in most approaches to the prevention of SUDs (Nelson et al., 2022) and non-substance related addictive behaviors (Vondráčková & Gabrhelík, 2016). A notable example is the PROTECT program, an evidence-based prevention intervention for gaming disorder and unspecified internet use disorders in adolescents (Lindenberg et al., 2020). PROTECT is a theory-driven, school-based preventive intervention delivered in four 90-minute group sessions (Lindenberg et al., 2022). This program is based on a theoretical model that posits maladaptive coping with negative affect as a central pathological pathway in the development of Internet use disorders. In line with this assumption, the PROTECT program aims to help participants develop alternative coping skills through a series of cognitive-behavioral techniques and emotion regulation strategies. Based on this preventive approach and the literature surrounding emotion regulation, adaptive coping, and PPU (Lew-Starowicz et al., 2020), the PPU-PrevFrame suggests the following approach for the implementation of this preventive component: (a) informational aspect of emotion regulation (psychoeducation about the definition and functions of emotions → difference between primary and secondary emotions and their differential impact on PPU → reciprocal interactions between thoughts, behavior, physiology, and emotions, and how these interactions may lead to PPU), (b) cognitive aspect of emotion regulation (psychoeducation about the connection between situations [A], beliefs [B], and emotional consequences [C] → identification, appraisal, and modification of maladaptive or distorted beliefs that contribute to emotional distress through cognitive restructuring → cognitive bias modification of overestimated reward expectancies [B] toward coping through pornography), (c) psychophysiological aspect of emotion regulation (breathing-based relaxation techniques → mindfulness-based exercises focusing on sensory awareness [e.g., of bodily sensations]), and (d) behavioral aspect of emotion regulation (behavioral substitution through the identification of alternative ways to cope with critical situations instead of using pornography → alignment between the emotional trigger and the coping behavior [e.g., doing exercise when feeling anxiety, engaging on social activities when feeling loneliness or depression, searching for a rewarding activity when bored, etc.] → monitoring emotional consequences of this alternative coping compared to using pornography).

2.1.7. Regular pornography abstinence periods (aka "pornography disconnections")

Justification. Taking regular breaks from using digital media services (or "*digital disconnection*" interventions) are advised to help individuals who overuse digital media. However, their effectiveness is still under scrutiny (Marciano et al., 2024). Some studies suggest that regular periods of digital abstinence may enhance positive affect, sleep quality, and overall well-being, while mitigating negative affect, stress, and depression (Radtke et al., 2022). In contrast, many others show no effects or even detrimental consequences (in terms of life satisfaction, social connection, or loneliness) (Lemahieu et al., 2025; Nassen et al., 2023). As for the effects of digital disconnection on the time spent using media and addiction-like symptoms, evidence seem more promising: different studies have reported that abstinence interventions reduce the time spent using media and craving after the cessation of the abstinence period (e.g., Cervigón-Carrasco et al., 2024), placing digital

disconnections as a potentially beneficial intervention for the prevention of excessive media use (King & Delfabbro, 2017).

Over the past decade, online self-help communities (e.g., "*NoFap*" or "*Reboot Nation*") have popularized abstaining from pornography use as a way to overcome perceived overuse and alleviate its negative consequences at a sexual and psychosocial level (Fernandez et al., 2021). A recent qualitative study analyzing the phenomenological experience of abstinence among members of one of these online "*rebooting*" forums found that most of them perceived achieving and maintaining abstinence a challenging goal, but those who were able to remain abstinent reported a range of benefits (e.g., increased sense of self-control [as expressed by decreased salience, craving, and compulsivity], improved mood, increased motivation and energy, mental clarity and productivity, improved relationship quality, increased sexual sensitivity, and better erectile function) (Fernandez et al., 2021). As a result, authors concluded that "*abstaining from pornography could potentially be a beneficial intervention for problematic pornography use*" (Fernandez et al., 2021, p. 711). Interestingly, average duration of abstinence attempts was 36.5 days, meaning that longstanding abstinence is not necessary to achieve these positive outcomes. Similarly, results derived from experimental pornography abstinence interventions provide evidence about the benefits of this practice. Three studies in which participants were asked to refrain from pornography for a period between two-three weeks found positive effects, such as greater relationship commitment, less delay discounting, and increased awareness of the own consumption pattern through observing one's own reactions to abstinence (for a review, see Fernandez et al., 2020). Relying on these findings, the PPU-PrevFrame hypothesizes that taking temporary breaks from pornography for a designated period of time may help individuals at high risk for PPU to gain control over this sexual behavior.

Description of the preventive component. The effectiveness of digital disconnection interventions depends on multiple aspects, such as their aim (i.e., controlled vs. total abstinence), the duration and periodicity of the abstinence period, or the use of technological aids to ensure a successful disconnection period. Recent studies show promising results for interventions aiming to reduce digital media time rather than promoting total abstinence (Marciano et al., 2024). However, others believe that these two disconnection strategies are complementary (Nguyen, 2021), meaning that a general reduction of the time using pornography and temporary breaks from pornography use complement each other, and may even have synergistic effects on the reduction of the risk of PPU. In terms of the duration of these pornography detoxes, average duration of digital breaks according to a recent review is around seven days (Lemahieu et al., 2025), a time period that the PPU-PrevFrame recommends when it comes to implementing pornography abstinence periods. Refraining from pornography for less than seven days is likely not sufficient to influence one's personal beliefs and behavior, whereas lengthier periods might increase the chance of discontinuation. Related to this issue of abstinence compliance, a recent review revealed that a considerable proportion of people intending to disconnect from digital media fails to do so (Lemahieu et al., 2025). For example, Przybylski et al. (2021) reported a compliance rate of 49.50% for a 1-day abstinence intervention, whereas Wadsley and Ihssen (2023) noted a compliance rate of 13.7% for a 7-day abstinence intervention. To reduce the likelihood of discontinuation of the abstinence period, the PPU-PrevFrame recommends the use of technological aids (such as content blockers). While we have previously elaborated on how these filters may help to reduce the time spent using pornography, their blocking features may be used during these detoxes periods to ban access and prevent non-compliance.

2.1.8. Other potential preventive components (when indicated)

Justification. Literature has identified multiple risk factors for PPU, such as lower self-esteem and sexual self-concept (Bőthe, Tóth-Király, et al., 2020; Kotiuga et al., 2025), relational and social aspects (social competence, perceived social support, and attachment anxiety) (Wizła & Lewczuk, 2024), or poorer lifestyle (Chasioti & Binnie, 2021), among many others. Relative to the vulnerability factors targeted by previous preventive components, these variables seem to be less robust predictors of PPU (Bőthe, Vaillancourt-Morel, et al., 2024). In other words, although these variables may be associated with PPU in certain individuals, they do not appear to represent universal vulnerability factors or account for a substantial proportion of the variance in the onset of this clinical condition. In contrast, other risk factors, such as distinct cognitive deficits (including attentional biases toward sexual stimuli, impaired inhibitory control, poor performance in working memory tasks, cognitive inflexibility, or disadvantageous decision making) are considered central in the onset and maintenance of PPU (Castro-Calvo et al., 2021). However, their clinical management (e.g., via cognitive training [Verdejo-Garcia, 2016]) is complex, and no empirical evidence is available concerning the use of this clinical approach in the treatment of PPU (López-Pinar et al., 2025). Besides, the current state of the art does not provide enough evidence to support its efficacy when used for preventive purposes (Gladwin et al., 2017).

An important consideration in the design of any prevention program is its "*efficiency*" (Le et al., 2021): priority should be given to components with the highest preventive potential, while incurring the lowest costs. While the implementation of preventive components tailored to potential underlying mechanisms –such as self-esteem or loneliness– may enhance, in certain cases, the efficacy of PPU prevention, their inclusion would make programs excessively long (and, therefore, inefficient). Similarly, incorporating preventive components that, although promising (as is the case of cognitive training), lack empirical support for their application to PPU or in a preventive format, would compromise the efficiency of the program. Against this background, we outline additional strategies that may complement the primary components of the PPU-PrevFrame in cases where the targeted processes or variables hold particular relevance for the intended population, but should not be adopted as a generalized approach to selective or indicated PPU prevention.

Description of the preventive component. In a review of 108 studies on the prevention of Internet-related disorders, Vondráčková and Gabrhelík (2016) identified a set of specific skills that may serve as protective factors among high risk individuals. These authors divided the skills into four basic areas, three of which encompass the risk factors pointed out previously: (1) skills associated with coping with stress and emotions (enhancement of self-esteem and positive personality traits), (2) skills associated with interpersonal situations (diminution of interpersonal sensitivity and strengthening of social competence and skills), and (3) skills associated with one's daily regime and use of free time (implementing sleep habits, carrying out group activities, or encouraging active participation in healthy activities). The literature has described multiple preventive interventions aimed to boost self-esteem (Moulier et al., 2019), enhance interpersonal skills and reduce loneliness (Cipriano et al., 2023), or promote a healthier lifestyle (Nieste et al., 2021). Those interested in addressing these specific skills as a part of their PPU prevention interventions may find these sources useful to develop their own components targeting these aspects.

Cognitive Training Interventions (CTIs) have been used in the field of SUDs to train the cognitive processes typically associated with these conditions, with the aim of enhancing their function and thereby reducing symptom severity and the likelihood of relapse (Verdejo-Garcia, 2016). CTIs can be classified into two modalities according to their primary aim: (a) interventions designed to train general cognitive abilities (e.g., working memory or inhibitory control) and (b) interventions intended to retrain automatic response biases to disorder-relevant stimuli (e.g., cognitive bias modification interventions targeting approach tendencies or attentional biases) (Wiers, 2018). Preliminary evidence regarding the implementation of these interventions in the treatment of SUDs is promising (Anderson et al., 2021; Wiers, 2018), but studies examining their use as a prevention component remain scarce. Although some researchers have examined how gamified versions of

popular CTIs may be applied to the prevention of SUDs in adolescents (Boendermaker et al., 2015), preliminary evidence does not support the transfer of task-based learning to real-world outcomes (i.e., although the targeted cognitive process improved after the use of gamified CTIs, these gains did not translate into reductions of the addictive behavior) (Boendermaker et al., 2016, 2017). Other authors have advocated for the use of CTIs in the prevention of non-substance related addictive behaviors (e.g., compulsive buying-shopping disorder [Thomas et al., 2024]). However, more caution is warranted when considering the implementation of these approaches as a component of PPU prevention. Nonetheless, we recognize the need for continued research on their applicability, both in preventive contexts and among patients with established PPU, for whom these interventions target a vulnerability factor –i.e., the cognitive domain– largely neglected in current therapeutic approaches (López-Pinar et al., 2025).

3. Conclusion

The lack of interest in designing and developing comprehensive approaches for the prevention of PPU is hardly surprising: in the field of addictive behaviors research, efforts have been predominantly directed toward developing therapeutic interventions to reduce the severity of already established clinical conditions, rather than toward the design of preventive strategies intended to impede their onset. Illustratively, a recent state-of-the-art review on addictive behaviors (including PPU) mentions the term "*treatment*" 37 times, whereas the term "*prevention*" is not mentioned at all (Brand, Antons, et al., 2025). Against this background, we propose a theoretically grounded approach to the universal, selective, and indicated prevention of PPU: the PPU-PrevFrame. This framework considers the multicausal nature of PPU, focusing on reducing the vulnerability factors associated with the onset of the clinical condition and managing the signs and symptoms that reinforce its escalation and maintenance over time. A strength of this approach is that it does not rely on promoting abstinence from pornography as the primary strategy for preventing PPU (Fernandez et al., 2021); instead, it emphasizes educating individuals about the risks associated with excessive and problematic pornography use, and equipping them with the skills needed to protect themselves from developing addictive patterns while respecting their sexual agency (Rothman et al., 2018). In line with this approach, the first preventive component of the PPU-PrevFrame aims to establish a knowledge base that empowers people to engage with pornography in an informed and reflective manner, thereby lessening its potential adverse effects at attitudinal or intrapersonal levels. This foundational knowledge is then complemented with other strategies for individuals who are at risk of PPU or who exhibit early signs of this clinical condition, focused on regulating the pattern of pornography consumption to prevent overuse (e.g., educating about the addictive features behind pornography, promoting internal/external control, or boosting emotion regulation and adaptive coping skills). As a result, the PPU-PrevFrame would address one of the most under-researched areas within the field of PPU, representing a significant gap in the literature (as identified by a recent comprehensive, interdisciplinary, and expert-informed narrative review [Ince et al., 2026]).

The assumptions, structure, and components underlying the PPU-PrevFrame are driven by a careful examination of the extant literature, together with observations of strategies that have been successfully implemented in the prevention of SUDs and behavioral addictions. Although we accompany this proposal with a solid theoretical and critical analysis about whether this approach could be effectively implemented in the prevention of PPU, future studies testing the effectiveness of each component or the program as a whole are warranted. The results of these studies will also allow us to examine whether the PPU-PrevFrame would benefit from adaptations depending on the specific population to which it is targeted. In this regard, a recent qualitative study has highlighted the relevance of tailoring the methods and contents of sexual education –in particular, those related to pornography use— to the age of the target population, distinguishing between school-age children and adolescents (Ruiz-de-Larrinaga et al., 2026). Similarly, numerous studies have demonstrated that the risk factors associated with PPU differ according to gender (Kowalewska et al., 2025) and sexual orientation (Jennings et al., 2024), underscoring the importance of considering these aspects when developing adaptations of the PPU-PrevFrame that may increase its specificity and effectiveness in particular populations.

CRediT authorship contribution statement

Jesús Castro-Calvo: Writing – review & editing, Writing – original draft, Conceptualization. **Marta García-Barba:** Writing – review & editing. **Patricia Beltrán-Martínez:** Writing – review & editing. **Joël Billieux:** Writing – review & editing.

Ethics approval statement

This article does not involve any studies with human or animal subjects and ethics approval is therefore not required.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT in order to improve English grammar. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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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.

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Data availability

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

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