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Ana Filipa de Almeida Figueiredo

Pornografia Online e a sua Relevância Clínica nas Disfunções Sexuais em Homens Heterossexuais: Uma Revisão da Literatura. / Online Pornography and its Clinical Relevance in Sexual Dysfunctions among young heterosexual men: A Literature Review.

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Eu, Ana Filipa de Almeida Figueiredo, abaixo assinado, nº mecanográfico 201606321, estudante do 6º ano do Ciclo de Estudos Integrado em Medicina, na Faculdade de Medicina da Universidade do Porto, declaro ter atuado com absoluta integridade na elaboração deste projeto de opção.

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TÍTULO DISSERTAÇÃO/MONOGRAFIA (riscar o que não interessa)

Online Pornography and its Clinical Relevance in Sexual Dysfunctions among young heterosexual men: A Literature Review.

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“O fracasso é a chave do sucesso. Cada erro ensina-nos algo.”

- **Morihei Ue**

Online Pornography and its Clinical Relevance in Sexual Dysfunctions Among Young Heterosexual Men: A Literature Review

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Online Pornography and its Clinical Relevance in Sexual Dysfunctions Among Young Heterosexual Men: A Literature Review

Abstract: Over the past 20 years, the world of online pornography underwent on a massive expansion. The easy and uncontrolled access to sexual content online allows anyone of any age, anywhere to use it as they please. At the same time, sexual dysfunctions, traditionally seen as age-dependent, started to be increasingly reported by younger men. Several studies have explored how pornography use relates to sexual health, but the available literature has several limitations to collect strong data. This review aims to identify and analyse the available literature about online pornography and its relation with sexual disfunctions among heterosexual men. Despite the large variety of studies reporting this issue, we found a considerable diversity of outcomes. This appears to be related to a lack of consensus on the definition of problematic pornography use and the absence of standardized diagnostic methods. During sexual development, several questions may arise, which, despite the risk of misinformation, can promote the search for answers on the internet anonymously to avoid the feeling of shame. In this view, clinicians should be aware of a possible relation between sexual disfunctions and online pornography use, identifying specific complaints and be prepared to approach such a case. Recognized risk factors for sexual dysfunctions and distinct pornography-use profiles should be considered both in clinical setting and research clinical studies.

Keywords: sexual dysfunctions, problematic pornography use, online pornography addiction, compulsive sexual behaviour disorder, men.

Introduction

Over the past two decades, digital entertainment has exponentially grown. Easy access to the Internet, either with a smartphone or electronic advice, without any control of the content, has led to a significant increase in online pornography consumption among the younger population (Jacobs et al., 2021; Vaillancourt-Morel et al., 2019). Concerns about potentially deleterious effects emerged. The main

concern was the impact of this phenomenon on the sexual well-being of consumers, especially on sexual dysfunctions and satisfaction (Perissini et al., 2021; Price et al., 2016; Whelan & Brown, 2021).

In the '90s, the number of men under 40 with erectile dysfunction seemed to be minor. In 1999, a cross-sectional study in the United States showed the rates of erectile dysfunction (5%) and low sexual desire (5%) in sexually active males aged 18 to 59 (Laumann et al., 1999). In 2007, sexually explicit videos appeared on free internet sites (Park et al., 2016). In 2001-2002, a global study about sexual attitudes and behaviours of sexually active men from 29 countries rated erectile difficulties in 10% (Nicolosi et al., 2004). A decade later, by 2011, erectile dysfunction rates in young Europeans aged 18-40 went up from 14% to 28% (Landripet & Štulhofer, 2015).

A 2015 "Brief Communication" analysed results from a 2014 large-scale Croatian survey focusing on sexual health and pornography use and reported ED (Erectile Dysfunction) rates as high as 30,8% in sexually active men (Landripet & Štulhofer, 2015). An internet-based survey conducted in Croatian and German couple men (mean age approximately 36) in 2015 reported that ED accompanied by a low desire for partnered sex started to be a common observation in clinical practice among men seeking help for their excessive sexual behaviour who frequently use pornography and masturbate (Klein et al., 2015; Perissini et al., 2021).

Usually, ED is considered an age-dependent problem (Nicolosi et al., 2004). It can be classified as psychogenic, related to psychological factors (e.g., stress or performance anxiety), or organic due to physical conditions (e.g., anatomical or pharmacologic side effects). For men under 40, the most frequent cause of ED is psychogenic. Recent epidemiological studies have reported high prevalence rates of

ED among young heterosexual men (≤ 40), and the findings suggested the increase in pornography use as an explanation for this phenomenon (Ludwig & Phillips, 2014).

In 2019 alone, the world's biggest porn site (Pornhub.com) hit a record with over 6.83 million new videos uploaded and over 42 billion visits, an average of 115 million daily visits (*The 2019 Year in Review – Pornhub Insights*, n.d.). In 2022, the mean visitor's age remained 37, but the number of visitors in the 18 to 24 age group grew. Also, mobile devices comprised 97% of all Pornhub traffic, with smartphones being 84%. The United States continues to have the highest daily traffic, followed by the United Kingdom. The average visit duration was 9 minutes and 54 seconds (*The 2022 Pornhub Year in Review | Pornhub Insights*, n.d.). Alongside this reality, clinicians noticed an increased number of young men self-presenting to treat self-perceived internet pornography addiction and confessed related sexual problems (Perissini et al., 2021). The lack of standardized criteria and validated scales to investigate online pornography addiction makes it difficult to have quantitative information, resulting in a shortage of scientific data and mixed findings. Therefore, developing a treatment algorithm is complex (Jacobs et al., 2021; Whelan & Brown, 2021).

Considering this exponential growth in both pornography consumption and concerns about its effects on young heterosexual men's sexual functioning, this paper aims to review the existing literature on pornography use and its impact on sexual functioning, synthesize the findings, provide recommendations for future research and to alert clinicians for the existence of this growing problem in society and the importance of being prepared to approach such a case.

Materials and Methods

Considering that this review intends to compile the existing literature on online pornography consumption, from its origin through its evolution to the present day, as well as its impact on the lives of young heterosexual men that consume it, a literature search of articles in English, Portuguese, or Spanish was conducted on PubMed based on queries related to the topic and, the last search on the database was on the 12th of February, 2023.

We excluded theoretical reviews, systematic reviews, and meta-analyses by filtering the search obtained through filters available on PubMed. This way, we conducted a first search with the following query: “(pornography OR online pornography) AND (sexual dysfunctions),” and we got 86 results. Title and abstract reading allowed the selection of the most relevant articles for a full reading. We excluded articles that only focused on sexual function in women, erectile dysfunction treatments, sexual violence, trauma, or abuse related to non-heterosexual men, and hypersexuality. After this, only 6 addressed the topic for reviewing, from which 4 were eligible and included in this review.

Facing a low number of articles, we conducted a second search with the following query: “((pornography OR online pornography)) AND (sexual dysfunctions) AND (men),” and we got 25 results. After reading the title and the abstract, we selected 12 articles for full reading which only 8 were eligible and included.

Still considering a low total number of articles, we conducted a third search with the following query, where we included more terms: “((pornography) OR (online pornography) OR (online sexual behaviour) OR (cybersex)) AND ((erectile dysfunction) OR (sexual dysfunction) OR (sexual satisfaction)) AND (men)” and we got 86 results.

Repeating the selection process, six articles were selected based on the title and abstract reading, and in the end, only three were eligible and included.

By searching with these three queries and applying the exclusion criteria, we obtained 15 eligible articles. Then, 28 additional articles were identified through the reference list of other articles and added to the review. So, 43 was the total number of relevant articles included in this review. The results of this process are summarized in Figure 1.

Results and Discussion

Online pornography use and sexual dysfunctions: Understanding the link

First, what is pornography? Social scientists commonly define pornography as sexually explicit materials intended to arouse (Nelson & Rothman, 2020). Back in the beginning, in 2007, researchers at the Kinsey Institute of Indiana University noticed that previous psychophysiological studies ignored individual variability in responsiveness. So, to improve understanding of individual differences in sexual response, function, and behaviour, they developed the Sexual Inhibition Scale (SIS)/Sexual Excitement Scale (SES) questionnaire, creating the Dual Control Model of Sexual Response. This model posits that sexual response in individuals is the product of a balance between excitatory and inhibitory processes (Bancroft et al., 2009). In 2014, Bronner and Ben-Zion reported a case of a man who used Internet pornography compulsively, which led him to escalate to extreme hardcore pornography and, as a result, low sexual desire during partnered sex. He sought help, and eight months after stopping all exposure to pornography, the patient reported that he had a successful orgasm and ejaculation during sex with his partner. (Bronner & Ben-Zion, 2014).

Problematic sexual behaviour related to the Internet is increasing through the unlimited flow of free, high-definition sex videos that are widely accessible 24 hours a day through electronic devices such as computers, tablets, and smartphones, driving to compulsive sexual behaviour (Griffiths, 2016). Internet pornography is considered an exaggerated imitation of reality and has been seen as a supernormal stimulus (D. L. Hilton, 2013). Sexually explicit material existed before it was available on the Internet, but video pornography is much more sexually arousing than other forms of pornography, such as still images (Ferretti et al., 2005). This problematic use of

online pornography has attracted research attention over time, and its effects on users have been increasingly studied (Blinka et al., 2022). Sporadic Internet users may benefit from seeking sexual information (Daneback et al., 2013). However, many risks have emerged. Excessive, problematic, compulsive, or addictive are the principal terms used to label the most discussed consequences of internet use for sexual purposes (Blinka et al., 2022). Online pornography has begun to be a rapidly expanding factor in rates of sexual dysfunction (Bancroft et al., 2009).

The available literature has several limitations resulting from survey-type studies conducted in some population groups where the researchers think the questionnaires are more likely to be completed (Blinka et al., 2022; Whelan & Brown, 2021). Thus, the results cannot be generalized and reflect only the study sample.

Studies in couples (Dwulit & Rzymiski, 2019; Willoughby & Leonhardt, 2020), show that pornography use may not necessarily be associated with lower sexual satisfaction and that, in some cases, can have a positive correlation.

Sexual Dysfunctions related to Problematic Pornography Use (PPU) reported by young heterosexual men

For most men, the most identified sexual dysfunctions are premature ejaculation, erectile dysfunction, and decreased sexual desire and satisfaction (McCabe et al., 2016).

A pattern of distinct profiles of internet pornography (IP) users emerged: men distressed by their IP use demonstrated more psychosocial problems than compulsive users. In contrast, recreational IP users showed little interference with life domains (Landripet & Štulhofer, 2015; Pascoal, 2017). Many studies have already reported that pornography use can harm physiological sexual functioning, which includes the need for more prolonged and more sexual stimulation to achieve orgasm (Dwulit & Rzymiski, 2019) and the need to fantasize about pornography during partnered sexual

activities to maintain sexual arousal (Droubay et al., 2020; Sun et al., 2016; Taylor, 2022). Conversely, IP users can benefit from this behaviour by exploring and satisfying sexual needs (Daneback et al., 2013). Sexual dysfunctions manifest in physical relations with women and, more rarely, sexually explicit material (Blais-Lecours et al., 2016).

Erectile Dysfunction

Erectile dysfunction (ED) is the inability to achieve or maintain an erection enough for sexual performance (Ludwig & Phillips, 2014). Clinicians have described pornography-related sexual dysfunctions, including Pornography-Induced Erectile Dysfunction (PIED). In this category, on most occasions of sexual activity, whether situational or all contexts, at least one of the following symptoms are described and experienced: substantial effort in obtaining an erection during sexual activity, in maintaining an erection until the completion of sexual activity, or noticeable decrease in erectile rigidity (Bancroft et al., 2009).

Impact on sexual desire

Neurobiological research shows that the potentially damaging effect of long-term pornography use on sexual desire, or libido, may result from changes in the reward system's response to sexual stimuli, preferably more active due to pornography-associated incentives than actual sexual intercourse (Voon et al., 2014). Given that, some studies have reported that topics with more incredible sexual boredom and lower libido may tend to masturbate more frequently (Carvalheira et al., 2015; Janssen et al., 2008), it is essential to elucidate the role that pornography use, and pornography-associated

masturbation may play in satisfying the need for sexual gratification (Carvalheira et al., 2015).

A 2014 study assessed the association between masturbation and pornography use among heterosexual male associates who reported decreased sex drive. They found that younger men who scored higher on sexual boredom were likelier to report a higher frequency of masturbation. Men who have difficulty maintaining sexual desire in a long-term relationship and are bored of having sex with their partner are likelier to engage in a high frequency of masturbation. Thus, it appears that self-pleasure is the way to obtain sexual gratification in a relationship that is no longer erotic (Carvalheira et al., 2015).

Changes in sexual satisfaction

Relational satisfaction is a vital sign of relational well-being (Flora & Segrin, 2016). Many studies have found that pornography consumption is associated with lower satisfaction in romantic relationships. A Few have also attempted to identify the boundary conditions of this association (Wright & Herbenick, 2022). Consistent with prior research, a 2022 study found a significant bivariate association between higher pornography use and lower sexual satisfaction (Wright, 2022).

The first longitudinal three-wave panel study (with six months between waves) conducted in this regard in a population of Dutch adolescents ($n = 1052$; 13-20 years old) found that pornography use constantly reduced sexual satisfaction but also that low sexual satisfaction improved pornography use. These bidirectional relationships must be considered, and other factors contributing to lower sexual satisfaction (which could potentially include sexual or psychosocial dysfunction) must be adopted to elucidate the reasons for pornography use fully (Peter & Valkenburg, 2009).

Is Problematic Pornography Use a Compulsive Disorder or an Addiction? The long-debated issue

According to The World Health Organization (WHO), the International Classification of Diseases (ICD-11) recently, on February 2022, made important adjustments to its Compulsive Sexual Behaviour Disorder (CSBD) diagnosis (*ICD-11 for Mortality and Morbidity Statistics*, n.d.). The changes specify that CSBD includes "pornography use" and "cybersex." It also debunks myths that CSBD has anything to do with moral judgments, high sex rates, religious conflicts, or cultural conflicts (*NoFap® Porn Addiction Recovery*, n.d.). With this inclusion, there has been increased public and professional interest in whether the use of pornography can have harmful effects on its consumers (Ince et al., 2021). However, the recently published Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR) in March 2022 does not recognize a diagnosis of sexual addiction/compulsion (including Internet pornography). Psychiatry constantly evolves, and as understanding grows, so do the schools of thought (DSM-5-TR Online Assessment Measures, n.d.).

According to DSM-5 and quoting the definition, "substance use disorder (SUD) is a complex condition in which there is uncontrolled substance use despite harmful consequences. People with SUD intensely focus on using a certain substance(s), such as alcohol, tobacco, or illicit drugs, to the point where the person's ability to function in day-to-day life becomes impaired. People keep using the substance even when they know it is causing or will cause problems. The most severe SUDs are sometimes called addictions." (DSM-5 - Addiction and Substance Use Disorders, n.d.).

Some other putative behavioral addictions, such as excessive consumption of online pornography, porn addiction, sex addiction, and porn-induced sexual dysfunctions, do not appear in the DSM-5 because the literature on them was relatively limited (Jacobs et al., 2021; Voon et al., 2014). The use of screening tests and the epidemiological survey

shows the intention to develop knowledge on addiction status by being as "objective" as possible, trying to eliminate all "subjective" dimensions of the diagnosis (Voros, 2009). The historical lack of consensus on the existence of IP addiction has led researchers to define it in multiple ways: hours of use (Cooper et al., 2011; Landripet & Štulhofer, 2015), behavioral addiction (D. Hilton & Watts, 2011; Voon et al., 2014), a subtype of generalized hypersexuality and self-perceived IP addiction (Blais-Lecours et al., 2016; Grubbs, Stauner, et al., 2015; Grubbs, Volk, et al., 2015). Furthermore, definitions differ regarding whether the focus is on objective behaviour or subjective experience. As a result, research on the impact of pornography addiction may be inconsistent (Grubbs, Exline, et al., 2015). In addition, the stigma associated with behavioral addictions, especially pornography addiction, and lack of awareness contribute to underreporting, making reported cases only the tip of the iceberg (Shrivastava et al., 2022).

A 2019 study focused on the prevalence and associated sociodemographic and clinical characteristics of CSBD in 539 (M=260; W=279) patients with (Obsessive-Compulsive Disorder (OCD). They described that 3.3% of OCD patients had current CSBD with a significantly higher prevalence in men. Besides, they found that CSBD in OCD was more likely to be comorbid with other impulsive, compulsive, and mood disorders but not behavioral or substance-related addictions. This finding supports the conceptualization of CSBD as a compulsive-impulsive disorder (Fuss et al., 2019). Despite the findings on CSBD, this study has some limitations, such as no control group of CSBD patients without OCD. Therefore, it is necessary to invest in future studies and address the shortcomings found in previous studies.

The role of moral incongruence and religiosity on self-perceived internet online addiction

The inevitable nature inherent in the labelling of sexual deviance leads us to the following conclusion: the diagnosis of pornography addiction, whether made by a layperson (partner, parent, anti-pornography activist) or a qualified person (therapist, clinician), will always be affected by a negative moral judgment of the practice (Voros, 2009). Moral incongruence involves disapproval of people's behaviour regardless of their moral beliefs (Lewczuk et al., 2021). Recently, religiosity and moral-related variables have been explored as factors contributing to self-perception of addiction and potentially promoting treatment seeking (Grubbs et al., 2019). In the last few years, clinicians and researchers have realized that a high frequency of pornography may not always be associated with PPU, as well as that self-reported PPU could be present with a relatively low frequency of pornography use as a result of moral incongruence regarding pornography use (Kraus & Sweeney, 2019).

Moral incongruence is mentioned in the ICD-11 description of CSBD diagnosis. It clarifies that distress related to religious judgments regarding sexual urges, impulses, or behaviours is insufficient to meet the CSBD criteria. Sometimes activists or porn industry affiliates present pornography addiction as religiously motivated, but it has practically no connection with religious views. One survey by No Fap indicated that only 14% of NoFap's users listed religious reasons as a factor in joining the peer support network (World Health Organization Recognizes Compulsive Porn Use - NoFap, n.d.). Alongside these debates about the integrity and usefulness of diagnosing pornography addiction, attention has been paid to the perceived addiction to Internet pornography. Perceived support for Internet pornography refers to the propensity of individuals to identify themselves as having difficulties with IPU, such as perceived compulsiveness in

use, regardless of whether their behaviours are objectively unregulated (Grubbs et al., 2018).

In a 2022 study, a qualitative analysis of symptoms in treatment-seeking men was conducted based on 23 interviews who were in treatment (aged 22 to 53 years). In all participants, uncontrolled sexual behaviour was related to the Internet, and there was no indication of disorderly sexual conduct. According to half of the participants, extreme masturbation during adolescence may be the precursor to their problematic behaviour. However, the problem entered the picture and was fully recognized much later, usually in the third decade of their lives. Most participants reflected on the onset and escalation of the problem during the first years after high school when they had more time to be alone (Blinka et al., 2022).

Compulsive Sexual Behaviour Disorder: Underlying Neural Mechanisms

For most people, pornography use is a form of entertainment. However, for some individuals, it becomes problematic use (Gola, Lewczuk, et al., 2016), and some behaviourally issues (e.g., e, excessive masturbation) make Internet addiction clinically recognizable (D. L. Hilton, 2013). Not all respond to external stimuli similarly, but those predisposed to obsessive behaviours will likely become addicted to pornography. IP users find more arousal in self-selected sexually explicit material than in sexual intercourse: sexual conditioning may be the missing connection between diminished sexual function during partnered sexual interactions and the facilitated arousal of online pornography (Banz et al., 2016; Blum et al., 2012; Gola, Wordecha, et al., 2016; Grubbs, Volk, et al., 2015). Such observations raised multiple scientifically and clinically significant questions concerning brain mechanisms related to PPU and their relationship to clinical measures (Gola et al., 2017). Internet pornography shares many similarities with substance

addiction, such as activating the same reward circuitry in the basolateral amygdala, the anterior cingulate area, and the nucleus accumbens (Ruffle, 2014).

A few crucial studies investigating the neurobiological changes of Internet addiction have found similarities between it and pathological gambling and substance use disorders, especially in the loss of control (Brand et al., 2014). Also, the adverse associations of Internet addiction to activity in areas of the brain that are central components of the default mode network (precuneus, posterior cingulate gyrus) were like those of other substance and behavioural addictions. Some defective brain mechanisms in the inhibitory control network could explain the lack of control in such behavioural addictions (Darnai et al., 2019). Along with disordered gambling, the Taq1A1 allele of the DRD2 gene (Banz et al., 2016) and homozygosity of the short allelic variant of the 5-HTTLPR gene (Lee et al., 2008) have been associated with IP use.

Brain reactivity triggered by visual sexual stimuli (VSS) is often interpreted within popular theoretical frameworks describing learning processes or motivated behaviour, such as Incentive Salience Theory (Gola, Wordecha, et al., 2016; Robinson & Berridge, 1993). Significantly, these theories distinguish between conditioned stimuli (CS) and unconditioned stimuli (UCS), which are related to anticipation/wanting vs. reward consumption/liking (Gola, Wordecha, et al., 2016).

The Incentive Salience Theory framework distinguishes two primary components of motivated behaviour – “wanting” and “liking”. “Wanting” is directly linked to the experienced value of the reward (unconditioned stimuli). “Liking” is related to the expected value of prized, often carried by a predictive cue (conditioned stimuli) (Robinson & Berridge, 1993). Also a 2014 functional magnetic resonance imaging (fMRI) study supports Incentive Salience Theory (awareness). In a model related to compulsive Internet pornography users and compared to healthy controls, compulsive

Internet pornography users had more significant activity on sexually explicit movies in the ventral striatum, amygdala, and dorsal anterior cingulate cortex. This same central network is activated during cortex reactivity and drug craving in addicts (Voon et al., 2014). Later, a 2016 fMRI reactivity study of heterosexual male pornography users increased previous findings. It was concluded that ventral striatum activity was more significant for preferred pornographic material than non-preferred pornographic material. Furthermore, more robust ventral striatum activity for preferred pornographic material was related to self-reported symptoms of addictive IP use (Brand et al., 2016).

It was also postulated that dysfunctions in the dopaminergic circuits make the individual more susceptible to addictive behaviours (such as Internet gaming or pornography) that feed the reward mechanism (Blum et al., 2012). IP use causes a release of dopamine within the limbic reward system, causing neuroplastic changes in the pathway and thus perpetuating the experience. These changes are then gradually integrated as "brain maps" for sexual arousal. The researchers also referred to the concept of tolerance because of repeated consumption of Internet pornography, which leads to the individual consuming more graphic content (Ruffle, 2014; Shiri et al., 2007).

Conversely, failure to meet sexual expectations can decrease dopamine in the mesolimbic pathway, ultimately resulting in a loss of interest in sexual intercourse and sexual dysfunction (Blum et al., 2012).

Self-perceived Internet Pornography addiction and its impact on young's heterosexual men sexual life

Do Internet Pornography Use and Self-perceived Internet Pornography addiction both impact sexual function in young men?

As previously referred to in this review, the need for standardized and validated scales results in a need for more scientific data. The diversity of outcomes seems to be

influenced in 2 ways, a lack of consensus on the definition of PPU (Ince et al., 2021) and the use of global sexual response measures versus specific diagnostic scales (Derby et al., 2000; Downing et al., 2017).

The first studies about PPU have referred to the need for more research on the impact of IP addiction on sexual function using empirical measures of IP addiction and specific sexual dysfunction scales. (Ince et al., 2021). With growing qualitative evidence (Whelan & Brown, 2021), researchers found that IP use was associated with positive and adverse sexual outcomes (Hald & Malamuth, 2008; Laier et al., 2013). Since 2015, quantitative researchers have examined the association between IP use and sexual dysfunction and found no association between hours of IP use and sexual dysfunctions like ED (Landripet & Štulhofer, 2015; Prause & Pfaus, 2015). Different sexual outcomes demonstrated further evidence of other user profiles (Whelan & Brown, 2021). These studies advanced evidence for an association between self-perceived IP addiction and sexual dysfunction over IP use alone (Blais-Lecours et al., 2016).

Is there a clinical profile of problematic pornography use?

Although PPU is now diagnosed through the International Classification of Diseases, 11th revision, its clinical profile remains controversial (Ince et al., 2021). In 2020, a study tried to identify the most central symptoms of PPU to direct the treatment strategies to reduce PPU. They use a network analytic approach of self-report questionnaires about the participants' past-year pornography use frequency and PPU measured. The results showed that pornography use frequency is not a central symptom of PPU (Bőthe, Lonza, et al., 2020) Supported by previous literature (Bőthe et al., 2018; Bőthe, Tóth-Király, et al., 2020; Gola, Lewczuk, et al., 2016), PPU is positively related to the frequency of

pornography use (FPU), but it varies due to individual differences. The core symptoms identified were salience, tolerance, withdrawal, and conflict (Böthe, Lonza, et al., 2020).

Another recent study assessed whether PPU could be characterized by several symptoms observed among online forums that currently lack empirical evaluation, such as cognitive-affective problems aggravated following pornography use and sexual dysfunction with partners due to escalating use. Through online surveys answered by men with PPU, the results suggest that PPU is characterized by tolerance, escalation, amounts of recent pornography use and increased sexual reactivity toward pornography, and increased psychological distress. In contrast, other symptoms such as impulsivity and compulsivity traits and moral or religious disapproval of pornography use did not promote the severity of PPU (Ince et al., 2021).

Based on the association of PPU and FPU, a different study published in 2020 tried to identify profiles of pornography use by applying a person-centered analysis approach through three non-clinical samples. As a result, they were able to identify three distinct pornography-use profiles: nonproblematic low-frequency pornography use (68-73%), nonproblematic high-frequency pornography use (19-29%), and problematic high-frequency use (3-8%) (Böthe, Tóth-Király, et al., 2020). These findings can allow further large-scale clinical studies to consider different and individual psychological mechanisms, which can lead to different treatment approaches.

Understanding the impact of Self-perceived Internet Pornography addiction on sexual function using specific sexual dysfunction assessment scales

Additional studies used specific sexual dysfunction assessment scales to extend the assessment of the impact of self-perceived IP addiction on sexual function. In 2021, a cross-sectional cohort of 2003 men participated in an anonymous online survey

publicized on Reddit social media only on the groups where IP was shared. This large study used the following scales: Cyber-Pornography Use Inventory (CPUI-9); International Index Erectile Dysfunction-5 (IIEF-5); The Checklist for Early Ejaculation Symptoms (CHEES); New Sexual Satisfaction Scale (NSSS); Depression Anxiety Stress Scale-21 (DASS) and Frequency and Duration of IP Use to assess if there was an association between IP use alone and Self-perceived IP addiction separately, with ED, early ejaculation (EE), and SS (Whelan & Brown, 2021). Consistent with previous findings (Blais-Lecours et al., 2016; Landripet & Štulhofer, 2015; Prause & Pfaus, 2015), this study found insufficient evidence of an association between the frequency or duration of viewing IP and ED. However, the results showed that self-perceived IP addiction was related to negative sexual outcomes (predicted increased ED, EE, and individual dissatisfaction) in sexually active young men aged 18-44 who use social media sites to share IP. They also concluded that subjective interpretation of one's IP use contributed to IP-related sexual problems in this sample of males who share IP on social media sites. So, for further research and clinicians, self-perceived IP addiction should be considered a possible contributing factor to sexual dysfunction (Whelan & Brown, 2021).

Also, in 2021, another study aimed to understand better associations between problematic pornography consumption (PPC) and ED. They collected data from an online survey with 118 items and then analysed 3419 responses by men aged 18 – 35. The survey used validated questionnaires such as Cyber Pornography Addiction Test (CYPAT), IIEF-5, and Alcohol Use Disorders Identification Test-Concise (AUDIT-C) to estimate the amount of porn watching. According to their IIEF-5 scores, 21.48% of sexually active participants (i.e., those who have had penetrative sex in the previous four weeks) had some degree of ED, controlling for covariates. Higher CYPAT scores indicated that problematic online pornography consumption led to a higher probability of ED. However,

only consuming pornography for more than 30 minutes shows a slightly higher frequency of ED (Jacobs et al., 2021). The researchers supposed that the association between PPC and ED might be more robust in a clinical sample of treatment-seeking men (Bóthe, Tóth-Király, et al., 2020) based on the association seen in their study. The high rates of pornography consumption found were like those of several population studies (Pizzol et al., 2016) and Pornhubs' 2019 statistics (The 2019 Year in Review – Pornhub Insights, n.d.). Masturbation is a constant source of sexual health for many young men (Jacobs et al., 2021; Keane, 2016; Perry, 2020), and it is not necessarily a sign of pathology. They have found no evidence to support that the frequency of masturbation influences ED.

Self-perceived Internet Pornography addiction and its relationship with psychological distress and Psychopathological Symptoms

Regarding relationships, single men and men in a new relationship reported more ED than men in a long-standing relationship. As critical stress factors, performance pressure, anxiety, and insecurity were found to be the most relevant and essential to assessing when a young man consults for ED. Considering pornography more exciting than actual sex also contributes to this prevalence of ED. 56% of participants with ED reported it versus 17% who found real sex more exciting (Jacobs et al., 2021). This was shown in another study (Berger et al., 2019), where 79% of participants with ED preferred pornography over partnered sex. A recent study (Mennig et al., 2022) used the Online Pornography Disorder Questionnaire (OPDQ). This tool adapted the official criteria from the DSM-5 for Internet Gaming Disorder to online pornography to examine to what extent consumers with a self-perceived problematic use of online pornography (OP) differ from casual users, especially regarding their psychological distress (Mennig et al., 2020; Petry et al., 2014). At this point, there were no standardized criteria yet for assessing the problematic

use of online pornography. However, many researchers argue that problematic pornography use should be classified as a specific internet use disorder (Brand, Young, et al., 2016).

In clinical experience, Self-Perceived Problematic Online Pornography (SPP-OP) may often react to existing psychological distress. SPP-OP would be a response strategy to existing psychological distress in this case. This study's results suggest that SPP-OP use is associated with severe psychological distress (i.e., emotional difficulties, guilt, shame, inadequacy, and aggression). Also, they found a group suffering simultaneously from SPP-OP use and elevated psychopathological symptoms (i.e., depression, anxiety, stress, loss of concentration, lower self-esteem, and reduced physical and psychological well-being) (Mennig et al., 2022). Therefore, in the context of treatment, it may be helpful to explore OP use since problematic use can perpetuate existing psychological distress and a severe problem, which requires awareness and, in some cases, clinical attention.

World of Online Sexual Activities (OSAs)

Several studies have shown that problematic use of online sexual activities (OSAs) may constitute a dysfunctional strategy reflecting compensatory Internet use (Kardefelt-Winther, 2014). Some specific risk factors - self-esteem, loneliness, and social anxiety - have hardly been studied in this context (Bozoglan et al., 2013; Caplan, 2007; J. Kim et al., 2009).

One of the most popular Internet-related activities is online sexual activities, with online pornography being the most studied (Laier et al., 2013; Wéry et al., 2020). However, other varieties of OSA exist, such as sexual webcams, 3D sexual games, online/offline sexual contact searches, and sexual information searches (Ballester-Arnal et al., 2014; Wéry & Billieux, 2016). Thus, existing studies have significant limitations for which these three psychological factors may not be similarly involved. To fill this gap

in the literature, a 2022 study conducted an online survey on a sample of self-selected men who used OSAs regularly and analysed a theoretical model in which these risk factors are hypothesized to predict the type of OSAs favoured and its potential addictive use. The results showed that low self-esteem is positively associated with loneliness and high social anxiety, positively related to engaging in two specific OSAs: pornography use and seeking online sexual contacts. A better understanding of the psychological factors involved in developing and maintaining problematic OSA use is needed, given the pervasiveness of OSA in the general population (Wéry et al., 2020)

One form of online sexual activity addiction is cybersex addiction, which is the most frequent form of internet addiction (Laier et al., 2013; Wéry & Billieux, 2017). A study was conducted to examine potential predictors of a tendency toward cybersex addiction regarding subjective complaints in daily life due to online sexual activities and demonstrates the critical role of emotional arousal and psychological symptoms as potential correlates of developing or maintaining excessive online sexual activity. To reinforce this, two other experimental studies were conducted. The results support the gratification hypothesis, which assumes reinforcement, learning mechanisms, and craving to be relevant processes in developing and maintaining cybersex addiction. Poor or unsatisfying sexual real-life contacts cannot sufficiently explain cybersex addiction. So, positive reinforcement in terms of gratification plays a significant role in cybersex addiction (Laier et al., 2013). In 2020, due to COVID-19, an increasing trend among viewers was attributed to applying lockdowns. The lack of work and outgoing activities caused people to spend more time on the screen, which also increased the viewing of pornography (Awan et al., 2021).

Adolescents and Web Porn: A new generation

Pornography has become progressively available to adolescents through the Internet without any control (Griffiths, 2016). The increasing presence of pornography in the sexual socialization of young men raises questions, especially as they move from adolescence to adulthood, about the potential impact of pornography on dyadic sexual encounters and how can pornography use has implications in the heterosexual form of men's sexual behaviours, attitudes, and expectations during sexual intimate time with women (Braun-Courville & Rojas, 2009; Mennig et al., 2022; Peter & Valkenburg, 2009).

A 2009 research indicates that men who view high rates of pornography express less pleasure in enacting sexually intimate behaviours and are more likely to depend on pornography to become and remain sexually aroused. Also, when engaged in dyadic sexual behaviours, they are more likely to integrate pornography into sexual activities (Tsitsika et al., 2009). These results clarify the relationships between pornography use and male consumers' attitudes and beliefs about real-life sexual relationships (Grubbs, Volk, et al., 2015; Schneider, 2007).

When it comes to sexual health, young men seem to be misinformed. Research shows that online pornography is a significant source of sex education for them (Alexy et al., 2009; Hunter et al., 2010). Still, it lacks information about the consequences of risky sexual choices and portrays false fascistic expectations about sexual encounters (Tsitsika et al., 2009). Access to accurate health information and education is a keystone of primary prevention. We do not know how, where, and why they get sexual health information.

A 2015 project investigated what young men know about sexual health and where they find this insight. Some interviews with young men (aged 16-19) concluded they were poorly informed. Their knowledge mainly came from school-based sexual health

education that only provided a narrow scope of physiological information. Young men seek sexual health information from various sources perceived as unreliable, including the Internet, friends, pornography and some seek input from family. Clinicians were seen as trustworthy sources of information but were not accessed for this purpose due to embarrassment. These findings identify potential improvements to school-based sexual education and online resources and describe a need for innovative technology-based sources of sexual health education (Litras et al., 2015).

In a 2020 study, the percentage of adolescents who reported sexual interest and used digital media to obtain sexual information was 25.6% (Farré et al., 2020). Furthermore, there appears to be an association between adolescents engaging in riskier sexual behaviours and the likelihood of searching for this information on the Internet (Aicken et al., 2016). Some barriers teens report when doing this type of research are the overabundant content that is difficult to filter and complaints about unintentional exposure to sexually explicit content during these surveys (Patterson et al., 2019). Following this, in 2020, a multidisciplinary team of designers and researchers developed a project that aimed to co-design a relevant, usable, and acceptable digital prototype called "The Gist" to address the pornography literacy needs of vulnerable youth. They found that, although participants could identify problems with pornography and criticize its messages, they lacked the information to understand healthy alternative attitudes and behaviours. As digital platforms are seen among this group as a source of anonymous secondary information, a digital resource that provides detailed and practical information about sex, sexual ethics, and relationships would help vulnerable youth identify and contrast inappropriate messages they receive from pornography and society. These recommendations are essential for conceptualizing digital pornography literacy programs (Davis et al., 2020).

Recently, in Portugal, a study published in 2022 aimed to examine whether sexual difficulties are related to problematic social media use (SNS). Participants were heterosexual men and women aged 18-30 years. The researchers conclude that addictive SNS use is primarily associated with decreased sexual function, not addictive smartphone use *per se* (Fuzeiro et al., 2022). Furthermore, the association of problematic use of SNS is strongly correlated with male erectile dysfunction and sexual dissatisfaction. It is plausible that social media's widespread and compulsive use competes with attention to partners and others more generally. It led to a lack of relationship closeness and perceived social support, which may lead to decreased sexual function (Alimoradi et al., 2019).

Anonymous help-seeking: Internet forums to discuss porn addiction and the recovery process.

Internet pornography addiction is the topic of many self-help books, online communities, and support groups, such as “NoFap.com” (Grubbs et al., 2018).

Quoting from their website, NoFap® is "a comprehensive community-based porn recovery website. We offer all the tools our users need to connect with a supportive community of individuals determined to quit porn and free themselves from compulsive sexual behaviors" (*NoFap® Porn Addiction Recovery*, n.d.).

In the last few years, following the exponential increase in the use of mobile devices, the Internet has reshaped communication patterns, leading face-to-face interaction between two people to becoming increasingly scarce and being almost entirely replaced by messages that can be anonymous, public, viewed, and commented on.

Healthcare research has investigated the positive and negative feelings related to social media and associated with various conditions, but it has never been done in sexual

medicine (Sansone et al., 2019). The anonymity of the Internet has some benefits for men with PPU seeking help: performers and patients might look for online consultations or discuss potentially shameful topics without revealing their identities (Wagner et al., 2005). In 2019, a study qualitatively evaluated ED and discussions about premature ejaculation (PE) from the social media platform Twitter. Tweets about sexual dysfunctions are shared daily with those about ED prevailing and aiming to treat. Using a new approach to explore the real-life scenario, this study proves that Twitter users openly discuss sexual health topics on social media with different goals and motivations, ranging from scientific interest to public outrage (Sansone et al., 2019). Continuing the social media field, there is an anonymous website and discussion board called Reddit ® , in which discussants feel comfortable sharing personal medical concerns, opinions, and advice with individuals who are contending with similar issues (Jiang et al., 2020).

In 2021, a study already referred to in this review used an online survey conducted on the Reddit website based on some specific scales related to sexual satisfaction and dysfunction, and found, being consistent with previous findings, that there was insufficient evidence of an association between the frequency or duration of IP viewing and ED. However, increased self-perceived IP addiction scores predicted the progress of ED, EE, and individual dissatisfaction in sexually active young men aged 18-44 who share IP on social networking sites (Whelan & Brown, 2021).

A study published in 2022, extracted posts and responses from the Reddit ® community Erectile Dysfunction to identify discussion themes. About 48% of discussants believed their ED was psychogenic. Only 28% reported seeing a health care professional for ED, suggesting that men turn to peers on the Internet first, despite the risk of misinformation. A majority attributed symptoms to psychological causes and excessive pornography/masturbation. It follows that social media platforms like Reddit ® empower

young men (median age 24) to discuss ED concerns. These data emphasize the importance of proactively engaging with young men in the consultation room and online (Jiang et al., 2020). Using the anonymous social media website Reddit ® (*Porn Addiction Forum*, n.d.), it was selected a post from a discussion forum from young males sharing their stories and concerns and asking for help on 9th of March 2023:

"M (20 y): So, I started with watching porn when I was either 13 or 14 years old in the beginning things were fine. I was probably watching normal porn every other day mostly once a day sometimes twice. But throughout the years, that started to change especially when I graduated high school and started college. During my high school years the porn I was watching started to increasingly become more aggressive and I started watching porn almost everyday but I was still in high school which kept me busy. But when I graduated I was supposed to go to college and stay on campus but then COVID hit and I ended up staying at home doing online courses (3) and that gave me a lot of free. I also didn't have many friends in high school so once I graduated I lost touch with them and I was hoping to make new friends in college. Due to the boredom of staying at home all day being a full time student, no friends to talk with, and sometimes the stress of school. I started to have a lot a lot of free time being on my phone all day not needing to leave the house for anything most of the time and just working on school work online. During the time I was 18 to now 20 years old, the frequency of me watching aggressive and taboo porn started to increase again. I started to watch porn 2 times a day to now being sometimes 3 times a day. Whenever I feel bored, stressed, or lonely, all I can think about is porn. It started to effect my sleep schedule or how much time I study and get my school done instead of doing it last minute. Porn is one of the first things I look up in the morning and one of the last things I look at before bed just to see if there is anything new. Now I always feel bad whenever I'm done masturbating I always tell myself that "this is the last time" or "one more time and I'm done" but the next day I watch it again the longest I went was 3 or 4 days without porn. I know it's gotten unhealthy and I know if I stop I can become more productive in life but it's just hard to stop it, I mostly start thinking about it when I'm bored or stressed with school or something and it just helps me forget those problems. I started going to the gym 4 times a week it helps a little bit. But yeah I just feel like a loser now I don't know who to talk to about it.

I'm hoping yall can give me any advice or words of encouragement this is my first time speaking about this but one of my goals is to just last a week without porn then a month and hopefully longer someday. But that's all I'm done thx for reading.” (*I (20M) Feel like a Loser : PornAddiction*, n.d.)

After reading this statement, it is possible to summarize some signs and symptoms present in this young man:

- Started to consume pornography very young;
- Obsessive thoughts around pornographic content;
- Consumption of pornographic videos two a three times per day;
- Consumption associated with craving and compulsive masturbatory activity;
- Need to increase consumption and escalation over time (tolerance);
- Consequences on his functioning, social and emotional life, and health;
- Filled with shame and feelings of being a loser;
- Consumption can be a response strategy to existing psychological distress;
- Determination to stop the behaviour;
- Used digital media websites to obtain sexual advice.

The impact of viewing pornography at a young age on the sexual health of subgroups of young people is a significant public health issue (Davis et al., 2020). Since 2016, some states of the US have declared pornography a public health crisis, introducing non-binding resolutions. Evidence suggests that even though pornography may elevate the risk for specific health outcomes, public health researchers do not consider pornography a public health crisis (Nelson & Rothman, 2020). In a post-COVID world, there is potential for increasing complaints of behavioral addictions that require robust action to prevent them from becoming another major public mental health problem, as substance abuse disorders already

are. Objective and holistic diagnostic standards must be found before classifying every symptom or even mildly problematic use of Internet content(s) as an addiction (Awan et al., 2021; Fineberg et al., 2018).

Treatment-Seeking Men for Problematic Use of Pornography

It was observed that individuals interested in treatment for their pornography use and treatment-seeking reported a higher frequency of pornography use than those not (Bóthe, Lonza, et al., 2020; Gola, Lewczuk, et al., 2016; Kraus et al., 2016).

A study published in 2016 examined the prevalence and factors associated with men's interest in seeking treatment for pornography use. The results showed that approximately one out of seven men reported a current interest in seeking treatment for pornography use but had not yet done so, possibly due to shame, embarrassment, or lack of knowledge about where to go for help (Kraus et al., 2016). There was no clear pattern for help-seeking behaviour. Referencing again the study of Blinka et al., 2022, that aimed to analyse symptoms in treatment-seeking men, participants seeking help contacted different professionals, *e.g.*, psychotherapy, clinical psychology, psychiatry, and sexology. However, there were differences in the type of therapy. Some were prescribed serotonin-based antidepressants and others psychotherapy. Their partners were sexually unsatisfied because these men preferred pornography to partner sex and faced erectile difficulties. In most cases, problematic sexual behaviour was not the focus of treatment because participants primarily requested therapy for depression, erectile dysfunction, and treatment of problematic substance use rather than for uncontrolled sexual behaviour, *per se*. According to participants, none of the treatments were successful. When participants explicitly mentioned their problematic use of pornography, it was seen that their healthcare providers did not understand the nature of the issue or provide an atmosphere

or discourse that encouraged the participant to extrapolate on the problem. Also, many had problems with low self-esteem, loneliness, and perceived unattractiveness, so the psychotherapy usually focused on addressing those issues and did not consider sexual behaviour. The participants confirmed they were uncomfortable opening about issues related to their sex lives and sexual excesses. This was for several reasons, including the topic's sensitivity (i.e., feelings of shame), the desire to keep pornography in their lives despite the many problems it was causing, and because other issues, such as alcohol consumption, while minor, were seen as more damaging at that time. These cases show that some professionals may not be prepared to work with in this context because they underestimate the factors of addiction.

Analysis of symptoms reported by people in treatment for problematic sexual internet use (PSIU) is essential for a clear understanding of the condition, improved diagnostic guidelines, and better-targeted treatment approaches. Thus, all participants first described problematic sexual behaviour as a repetitive, long-term condition that another major illness or other disorder cannot explain, and that concerns a non-paraphilic behaviour (Blinka et al., 2022). There was a consensus among the participants about the manifestation of the following PSIU symptoms being prevalent and having negative consequences in their lives, which include (Klein et al., 2015; Wéry & Billieux, 2016): loss of control (Briggs et al., 2017), mood management (Reid et al., 2008), and salience/worry (Stein, 2008). However, there is weak evidence regarding tolerance and withdrawal symptoms. Some researchers doubt the existence of withdrawal symptoms and tolerance in behavioral addictions (Starcevic, 2016). The primary source of participants problem was masturbation and consumption of online sexual content, specifically cybersex which played a role in intensifying the experience compared to online pornography. Pornography consumption was originally a response to sexual urges.

Over time, it became a dominant activity and more convenient than any other sexual practice. Half the participants said excessive masturbation during adolescence was the precursor to their problematic behaviour. However, the problem emerged and was fully recognized much later, usually in the third decade of their lives, onset and worsening of the situation during the first years after high school when they had more time to be alone. Another pattern, although not exclusive to the above, was linked to the lack of an intimate partner and the need to be an overall success in the marriage market (Blinka et al., 2022).

In addition, many studies (Droubay et al., 2020; Grubbs, Volk, et al., 2015; Grubbs, Wilt, Exline, Pargament, et al., 2018; Lewczuk et al., 2021) have found that religiosity or moral incongruity can affect perceptions of one's behaviour, ultimately leading to overestimating the problem and (self-) misdiagnosis. On the other hand, based on a 2020 article exploring what criteria should be included for compulsive sexual behaviour disorder stated that moral incongruence (i.e., the probable religiosity behind it) is culturally influenced, and it is questionable its importance as an exclusion criterion for PSIU. The need for qualitative studies on the manifestations of PSIU in different cultural contexts can result in a misunderstanding of the issues (Laumann et al., 1999).

The Evolution in Treatment Research

In a 2002 paper, two case reports described two men (aged 42 and 62) with compulsive sexual behaviour (CSB) who were successfully treated with naltrexone. Both patients had severe CSB symptoms and had shown only slight improvement with SRIs or other antidepressants. After treatment with naltrexone, both patients denied any desire to engage in their previous problematic sexual behaviour and were able to stop it (Raymond et al., 2002). Like impulse control disorders, CSB is characterized by an urge to engage in unwanted behaviour, a non-resistance to the urge for sex. Opioid

antagonists have effectively treated urge-driven disorders like pathological gambling and alcoholism (Bostwick & Bucci, 2008; S. W. Kim & Grant, 2001; Raymond et al., 2002).

Based on the efficacy of opioid antagonists in treating impulse-associated disorders, the researchers hypothesized that naltrexone would reduce impulses and sexual behaviour. In both cases, symptoms decreased significantly with naltrexone. The use of naltrexone causes dose-dependent hepatic enzyme elevations in physically healthy individuals. Nevertheless, they noticed an increased risk of liver enzyme elevation when naltrexone is used concurrently with analgesics (Raymond et al., 2002). Thus, the use of naltrexone was only for those patients who do not require non-steroidal analgesics. However, more research was needed to confirm whether their observations could be generalized to other patients and clarify how naltrexone terminates addictive behaviour (Bostwick & Bucci, 2008). Problem behaviours may result from increased impulsivity (ventral-striatum-related reward reactivity) or anxiety (amygdala-related threat reactivity). Previous studies show that pressure can be decreased with paroxetine, which has been linked to reductions in amygdala volume (Szeszko et al., 2004). At the same time, other medications, such as naltrexone, can reduce reward reactivity (e.g., craving) and impulsivity (Bostwick & Bucci, 2008).

In a 2016 case presentation, three heterosexual males with PPU were treated with cognitive-behavioral therapy and paroxetine. The researchers sought to investigate the effectiveness of the serotonin uptake inhibitor paroxetine in combination with cognitive-behavioral therapy in treating problematic pornography use (PPU). However, they found that, although initially effective in reducing pornography use and anxiety, paroxetine treatment appeared related to new compulsive sexual behaviors after three months. They concluded that paroxetine might hold promise for short-term reduction of PPU and related

stress, but potentially distressing new sexual behaviors may emerge. The cases suggest that PPU may arise from multiple domains (Gola & Potenza, 2016).

There is currently weak evidence for the pharmacological treatment of CSBD and, therefore, a clear need for randomized controlled trials (Savard et al., 2022). That said, in 2022, when compulsive sexual behaviour disorder became a new disorder in the International Classification of Diseases (ICD-11) and is associated with negative consequences in different areas of life, the scientific community, based on weak evidence for pharmacological treatment of compulsive sexual behaviour disorder and limited treatment options, has proposed a study that will be the most significant and first randomized controlled trial comparing the efficacy and tolerability of pharmacological agents in compulsive sexual behaviour disorder—naltrexone and fluoxetine.

Future research recommendations and highlights for the clinicians.

Increasing and unlimited access to the Internet has opened an entirely new chapter for the pornographic online industry and simultaneously had a substantial negative impact on the health of younger people. The prevalence of erectile dysfunction in young men has significantly increased since it became possible to access pornographic content online, anywhere, and anytime, by simply having a cell phone with internet access. Given this phenomenon, several studies have been done to investigate the risk factors for ED in men under the age of 40. Traditionally, ED is seen as an age-dependent problem. Most results did not match the risk factors of ED in older men, such as smoking, alcoholism, obesity, sedentary lifestyle, diabetes, hypertension, cardiovascular disease, and hyperlipidemia (Martins & Abdo, 2010). The relationship between these two phenomena began to be the subject of studies. The results and conclusions suggested a significant association between the problematic use of pornography and the onset of sexual dysfunction in young

men. Despite a rapidly increasing number of recently published studies, the available literature has several limitations. Most of the existing knowledge is based on the results of self-reported pornography use, which does not allow for objective exposure confirmation. The presence of sexual dysfunctions such as erectile dysfunction is often self-reported and creates the risk of their being underestimated (Wéry et al., 2020). Consequently, the results cannot be generalized because they only reflect a specific man sample (Blinka et al., 2022). Most studies have used convenience samples to investigate the prevalence of problematic pornography use (Blinka et al., 2022; Mennig et al., 2022). Therefore, reported different rates of prevalence range from 0.7 to 9.8% (Ballester-Arnal et al., 2017; Bóthe et al., 2018; Najavits et al., 2014). Future research should go on extensive case-control studies and invest in more well-designed observational studies, particularly prospective cohort studies. Thus, when possible, the use of validated tools is advised. There are already many recognized risk factors for sexual dysfunctions which must be considered when evaluating the potential effects of pornography use.

Social media such as Twitter or Reddit could be helpful in sexual medicine by highlighting topics relevant to sexual dysfunction and their perceptions and social implications (Whelan & Brown, 2021). Furthermore, the subjective interpretation of their IP use contributes to IP-related sexual problems on social media sites. As mentioned earlier, religiosity or moral incongruity can affect perceptions of a person's behaviour (Droubay et al., 2020; Grubbs, Volk, et al., 2015; Grubbs, Wilt, Exline, Pargament, et al., 2018; Lewczuk et al., 2021).

The World Health Organization's 2019 diagnosis of Compulsive Sexual Behaviour Disorder, as clarified in, 2022-helps to debunk the online misinformation of those who have wrongly claimed problematic pornography use as unrecognized by the mental health community. It is a clear sign that the mainstream scientific and mental

health communities are moving toward officially recognizing pornography addiction (World Health Organization Recognizes Compulsive Porn Use - NoFap, n.d.). Clinicians should consider self-perception of problematic pornography use as a potential contributing factor to sexual dysfunction (Jiang et al., 2020). Also, primary care physicians should consider online pornography addiction a potential problem in patients with psychological distress or psychopathological symptoms. It is essential to establish a therapeutic alliance with the patient in which honesty and trust are encouraged, with a treatment plan and follow-up care based on other needs of the patient. Helping them seek accountability with someone they trust provides an excellent first step in getting the patient to recognize their problem (Dawson & Warren, 2012).

In terms of treatment, like other behavioural disorders, the treatment of online pornography addiction should include psychological and pharmacological modalities. Cognitive behavioral therapy provides patients with structured environments to better understand and cope with their compulsive behaviour (Young, 2007).

Another conclusion of this review is that much of the literature has focused on heterosexual individuals. It remains to be explored the potential effect of pornography on other groups. Future research should approach sexual orientation (homo and bisexual individuals) (Downing et al., 2017), physical disabilities, as these may also affect sexual satisfaction (McCabe & Taleporos, 2003), and co-occurrence of other sexual dysfunctions (pornography use may be a prolongation of pre-existing compulsive sexual behaviours) (Schneider, 2007).

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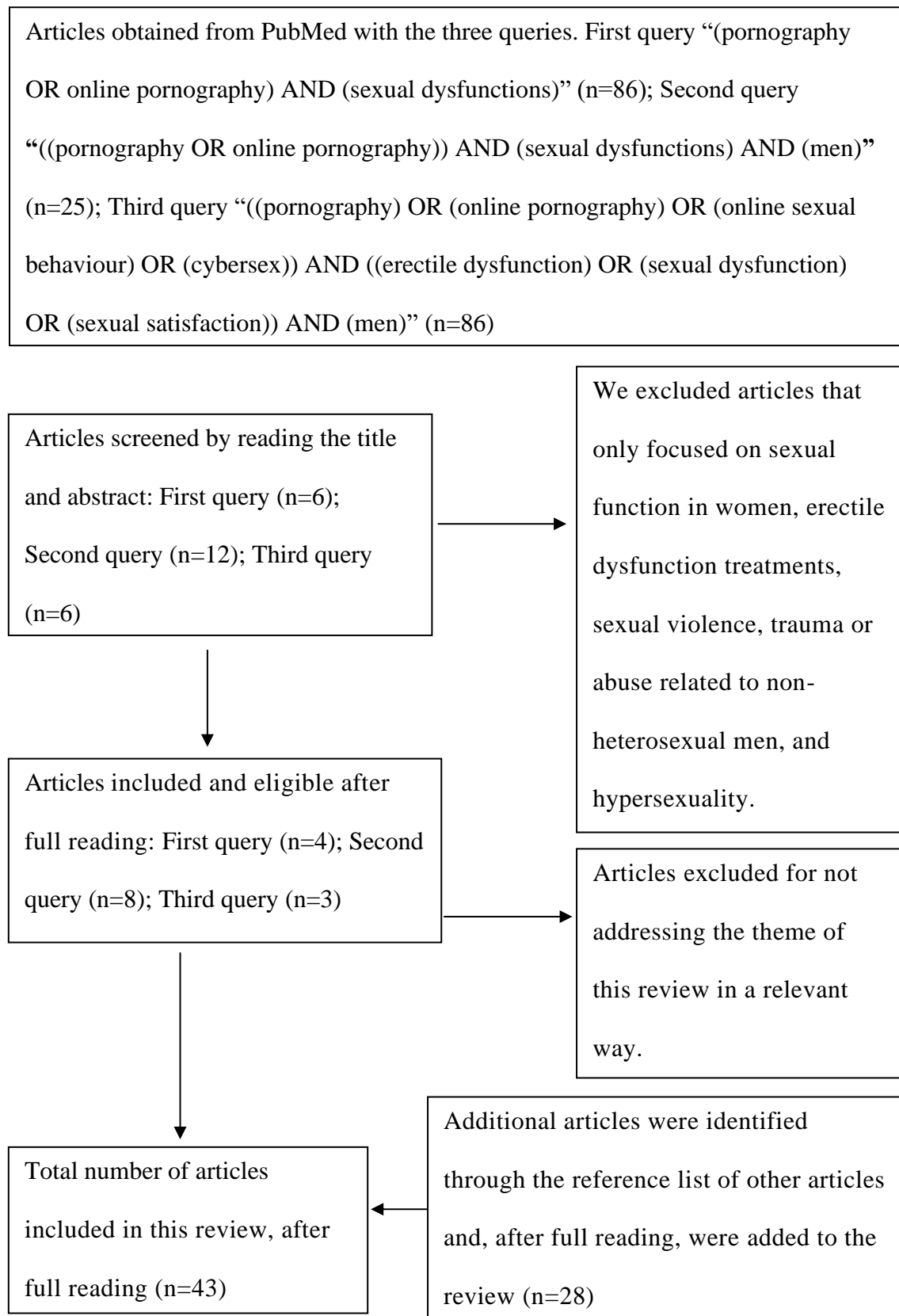
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Appendices

Figure 1. Flowchart of the selection process of the studies included in this review.



Reporting guidelines SANRA

(Scale for the Assessment of Narrative Review Articles)

Justification of the article's importance for the readership

0. The importance is not justified.
1. The importance is alluded to, but not explicitly justified.
2. The importance is explicitly justified.
 - i. *“Recent epidemiological studies have reported high prevalence rates of ED among young heterosexual men (≤ 40), and the findings suggested the increase in pornography use as an explanation for this phenomenon (Ludwig & Phillips, 2014)”*: Page 3, (paragraph 3).

Statement of concrete aims or formulation of questions.

0. No aims or questions are formulated.
1. Aims are formulated generally but not concretely or in terms of clear questions.
2. One or more concrete aims or questions are formulated.
 - i. *“Considering this exponential growth in both pornography consumption and concerns about its effects on young heterosexual men’s sexual functioning, this paper aims to review the existing literature on pornography use and its impact on sexual functioning, synthesize the findings, provide recommendations for future research and to alert clinicians for the existence of this growing problem in society and the importance of being prepared to approach such a case.”*: Page 4, (paragraph 2).

Description of the literature search

0. The search strategy is not presented.
1. The literature search is described briefly.
2. The literature search is described in detail, including search terms and inclusion criteria.

i. *“(…) compile the existing literature on online pornography consumption, from its origin through its evolution to the present day (…) a literature search of articles in English, Portuguese, or Spanish was conducted on PubMed based on queries related to the topic (...). We excluded theoretical reviews, systematic reviews, and meta-analyses (...) This way, we conducted a first search with the following query: “(pornography OR online pornography) AND (sexual dysfunctions),” (...). We excluded articles that only focused on sexual function in women, erectile dysfunction treatments, sexual violence, trauma, or abuse related to non-heterosexual men, and hypersexuality. (...) a second search with the following query: “((pornography OR online pornography)) AND (sexual dysfunctions) AND (men),” (...) we conducted a third search with the following query, where we included more terms: “((pornography) OR (online pornography) OR (online sexual behavior) OR (cybersex)) AND ((erectile dysfunction) OR (sexual dysfunction) OR (sexual satisfaction)) AND (men)” (...) By searching with these three queries and applying the exclusion criteria, we obtained 15 eligible articles. Then, 28 additional articles were identified through the reference*

list of other articles and added to the review. So, 43 was the total number of relevant articles included (...): Pages 5-6, (paragraphs 1,2,3,4,5).

Referencing

0. Key statements are not supported by references.
1. The referencing of key statements is inconsistent.
2. Key statements are supported by references.
 - i. *“Erectile dysfunction (ED) is the inability to achieve or maintain an erection enough for sexual performance (Ludwig & Phillips, 2014).”: Page 9, (paragraph 2).*

Scientific reasoning

(e.g., incorporation of appropriate evidence, such as RCTs in clinical medicine)

0. The article’s point is not based on appropriated arguments.
1. Appropriated evidence is introduced selectively.
2. Appropriated evidence is generally present.
 - i. *“The first longitudinal three-wave panel study (with six months between waves) conducted in this regard in a population of Dutch adolescents (n = 1052; 13-20 years old) found that pornography use constantly reduced sexual satisfaction but also that low sexual satisfaction improved pornography use. These bidirectional relationships must be considered, and other factors contributing to lower sexual satisfaction (which could potentially include sexual or psychosocial dysfunction) must be adopted to elucidate*

the reasons for pornography use fully (Peter & Valkenburg, 2009).”: Page 10, (paragraph 4).

Appropriate presentation of data

(e.g., absolute vs relative risk; effect sizes without confidence intervals)

0. Data are presented inadequately.
1. Data are often not presented in the most appropriated way.
2. Relevant outcome data are generally presented appropriately.
 - i. *“A 2019 study focused on the prevalence and associated sociodemographic and clinical characteristics of CSBD in 539 (M=260; W=279) patients with OCD. They described that 3.3% of OCD patients had current CSBD with a significantly higher prevalence in men. (...) (Fuss et al., 2019).”: Page 12, (paragraph 1).*

Guidelines for Preparing the Paper to *The Journal of Sex Research*

Structure

The paper should be compiled in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; acknowledgments; declaration of interest statement; references; appendices (as appropriate); table(s) with caption(s) (on individual pages); figures; figure captions (as a list).

Word Limits

There are no word limits for papers in this journal.

Style Guidelines

- American spelling style should be consistently throughout the manuscript.
- Double quotation marks are used, except where “a quotation is ‘within’ a quotation”.
- Long quotations should be indented without quotation marks.

Font

Times New Roman font in size 12 with double-line spacing.

Margins

Margins should be at least 2.5cm (1 inch).

Title

Bold is used for article title, with an initial capital letter for any proper nouns.

Abstract

An unstructured abstract of 200 words, focuses on what the research is about, what methods have been used, and what was found out.

Keywords

Between 3 and 5 keywords to help readers find the article.

Headings

This shows the different levels of the heading section in your article:

- (1) First-level headings (e.g. Introduction, Conclusion) should be in bold, with an initial capital letter for any proper nouns.
- (2) Second-level headings should be in bold italics, with an initial capital letter for any proper nouns.
- (3) Third-level headings should be in italics, with an initial capital letter for any proper nouns.
- (4) Fourth-level headings should be in bold italics, at the beginning of a paragraph. The text follows immediately after a full stop (full point) or other punctuation mark.
- (5) Fifth-level headings should be in italics, at the beginning of a paragraph. The text follows immediately after a full stop (full point) or other punctuation mark.

Tables and figures

Tables and figures should appear in the article text, for example, by writing [Table 1 near here].

Tables and figures are supplied at the end of the text.

Formatting and Templates

Papers may be submitted in Word format. Figures should be saved separately from the text.

The cover letter should include the following information: (a) a description of the ethical review process employed by the authors; (b) a statement that the manuscript has not been published and is not currently under consideration elsewhere. If the data has been published in some form elsewhere, the authors should indicate how the content of the submitted manuscript provides new information not available in previously published articles written by the authors.

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