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Pornography Consumption and Cognitive-Affective Distress

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Abstract: According to recent studies, the growing consumption of Internet pornography mainly in male population becomes an increasing problem, which is closely linked to compulsive sexual behavior. Some findings also suggest that Internet pornography consumption might represent a defense mechanism against excessive stress, which enables to cope with stressful events, helps in mood regulation, and decreases depression and anxiety. Users of online pornography involved in these activities also reported that their self-exposition to pornographic material may create guilty feelings and internal conflict in themselves with respect to their own "involuntary" sexual behavior, which suggest that psychosocial stress and possibly traumatic experiences may play a significant role in Internet pornography addiction. Taken together, these findings show that stressful experiences, anxiety, and depression are strongly related to pornography consumption. In addition, conflicting emotional experiences as well as identity problems significantly increase vulnerability to addictive sexual behavior and pornography consumption.

Key Words: Pornography, addiction, depression, anxiety, stress

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Recent research focused on pornography addiction indicates that the gradual increase of Internet availability, as well as anonymity and privacy of its using, significantly increased pornography consumption mainly in male population (Burtăverde et al., 2021; Griffiths, 2012; Mauer-Vakil and Bahji, 2020; Pizzol et al., 2016; Price et al., 2016; Ross et al., 2012; Wright, 2013). This increased Internet availability also plays a significant role in the process of losing self-control, which increases the risk of misusing Internet pornography and related addictive behavior (Block, 2008; Daneback et al., 2006, 2012; Ross et al., 2012). For example, recent findings indicate that three of five respondents included in a selected research sample have a problem with Internet pornography addiction (Ross et al., 2012), and it is most prevalent in men who live alone or with their parents (Cooper et al., 2000; Mauer-Vakil and Bahji, 2020; Price et al., 2016; Ross et al., 2012; Wright, 2013). In addition, recent findings show that Internet pornography consumption is highest in young adult men (Leiblum, 1997; Price et al., 2016; O'Sullivan et al., 2014; Shapiro, 2005; Štulhofer et al., 2016; Wright, 2013).

Although increasing Internet pornography addiction might become a severe epidemiological problem, the recently released *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM-5*) does not take too much into account this problem of excessive and disordered sexual behavior related to pornography consumption that might have serious mental health implications. Similarly, *International Classification of Diseases, 10th Revision* (*ICD-10*) does not specifically address this issue of excessive consumption of online pornography and its category F52.7 including excessive sexual urge and hypersexuality does not contain detailed diagnostic criteria.

PORNOGRAPHIC EXPERIENCE AND ITS NEUROBIOLOGICAL CORRELATES

Research of addictive behavior related to pornography suggests that approximately 56% of men experience pornography as a form of relaxation decreasing subjective feelings of tension (Cooper et al., 2004; Weiser, 2000). Other findings indicate that a large proportion of individuals involved in online pornography consumption are mainly seeking sexual relaxation and feelings of "satisfaction" related to masturbation (Ross et al., 2012; Mauer-Vakil and Bahji, 2020). Some findings also suggest that the Internet pornography-related addictive behavior might cause subjectively negative sexual experiences and increased sensitivity to stimuli and can cause symptoms of craving related to masturbation experiences (Laier et al., 2013) and fetishism (Ross et al., 2012).

In addition, various data indicate that manifestations of the "sexual addiction" related to excessive sexual behavior due to craving may cause inability of self-control and also subjective experiences of internal conflict, very similar to symptoms that usually manifest in obsessive-compulsive disorders (Goodman, 2001, 2008; Mauer-Vakil and Bahji, 2020). These symptoms may have very malignant effects mainly in adolescent age and can determine psychopathological changes related to processing of sexual stimuli and negatively influence sexual fantasies, attitudes, and behavior (Braun-Courville and Rojas, 2009; Cooper et al., 2004; Kafka, 2010). Further findings also indicate that Internet pornography exposure provides "artificial" (not natural) stimuli that do not correspond to real psychosocial contacts and interpersonal relations, which may lead to eliciting abnormal emotional responses (Burtăverde et al., 2021; Laier et al., 2013; Mauer-Vakil and Bahji, 2020; Ross et al., 2012; Štulhofer et al., 2016).

Main characteristic features of the pornographic emotional experiences represent unrelational and unrealistic perceptions of a second person at a pornographic scene as a sexual object represented by various images, videos, chats, video calls, or live streaming videos, mainly presented via pornographic Web sites such as Pornhub, RedTube, YouPorn, Xvideos, and xHamster or social networks, for example, Telegram, Snapchat, Chaturbate, Friends With Benefit, and Video Call Sex (Chen et al., 2013; Lanier, 2019; Mattebo et al., 2014; Ogas and Gaddam, 2011; Yulius, 2020). For example, Snapchat became very popular social network for "sexting" as the most usual way of sharing sexually explicit materials (Goodwin et al., 2015; Handyside and Ringrose, 2017; Park et al., 2016).

In addition, due to huge amount of pornographic material on the Internet, repeated experiences of immense number of sexually arousing objects lead to long-lasting arousing emotional experiences that decrease usual mechanisms of "habituation" and lead to very long periods of sexual arousal and sensitization to these stimuli. This sensitization related to long-term sexual arousal and hyperexcitability may have negative consequences for balance between excitatory and inhibitory neural systems, and due to various neurobiological changes, such as increased dopamine production and corticoid arousal, it may cause uncontrolled hypersexual behavior (Hilton, 2013; Shaw and Black, 2008; Štulhofer et al., 2016). In this context, certain authors suggest that this pornography-related hypersensitivity with respect to these unrelational sexual stimuli may implicate hypersexual addiction, which may have negative consequences for creating partnerships and normal attitudes

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of sexual behavior similar to those that may manifest in certain personality disorders (Burtăverde et al., 2021; Mauer-Vakil and Bahji, 2020; Montaldi, 2002; Paul, 2009; Skegg et al., 2010; Štulhofer et al., 2016).

Further research indicates that the repeated exposure to these artificial sexually arousing stimuli disturbs normal sensory signal processing at the medial preoptic area, which is the hub of the telodiencephalic reproductive complex (Kim et al., 2013). This atypical processing of sexually arousing stimuli also negatively affects neural networks of the mesolimbic reward center, which is usually involved in mechanisms of addiction (Roxo et al., 2011). Several neuroimaging data also suggest that repeated viewing of sexually arousing images (related to pornography exposure) has in its certain features similar arousal effects in the medial preoptic area as viewing of a real sexual partner (Hilton and Watts, 2011; Voon et al., 2014). The typical difference between "relational" sexual experiences and "unrelational" pornography stimuli is in addition repeated and frequent novelty of these pornography stimuli. The preference for a novelty of sexual partners has also been well documented in animal and human studies and described as the "Coolidge effect" (Fiorino et al., 1997; Wilson, 1997). Some studies suggest that the unbridled access to a large quantity of novel sexual images on the Internet has various effects on neural processing in the mesolimbic reward center, which is similar to some influences of addictive substances (Barrett, 2010; Burtăverde et al., 2021; Mauer-Vakil and Bahji, 2020; Pitchers et al., 2013).

On the other hand, some biological and psychosocial factors may create a predisposition for increased sensitivity to sexual stimuli related to pornography and may cause hypersexual "excessive" behavior and influence neuroendocrine activity, for example, elevated testosterone levels in younger men (Baumeister, 2000; Thatcher et al., 2008). This excessive sexual behavior related to pornography exposure later may have negative consequences for mental health and mainly cause dysphoria and/or depressed mood related to this addictive behavior (Bancroft et al., 2003; Laier et al., 2013; Peter and Valkenburg, 2011; Ross et al., 2012). For example, a study by Pizzol et al. (2016) examining 1500 high school adolescent men aged 18–19 years in their final year of studies suggests that pornography can affect habits, lifestyles, and sexual attitudes. The study also found that approximately 21.9% of participants tend to experience pornographic sites as their personal habit and approximately 10% of them reported reduced sexual interest to have real-life partnerships and prefer "virtual sex" as faster, safer, less demanding, and satisfying their special sexual fantasies (Pizzol et al., 2016).

As it is usual in the context of addiction, the brain may not have an availability to "reorder" itself and to return back to the normal sensitivity and to the previous "sex-maps," which may cause that feelings of satisfaction tend to decrease, and due to this process, men usually want more pornography-related sexual stimuli (Doidge, 2007). In this context, sensitization refers to a hyperactive conditioned response to cues associated with the pornography exposure. This sensitized process of "learning" mainly involves an enhanced mesolimbic dopamine system response that results in attribution of potentially pathological levels of incentive salience to cue-evoked seeking of drugs and natural rewards (Ostlund et al., 2014; Vanderschuren and Pierce, 2010; Volkow et al., 2008). Some findings suggest that glutamatergic synapses associated with seeking and obtaining a particular reward undergo modifications, which enhance the response of the mesolimbic dopamine system to that same reward (Nestler, 2008, 2013).

Because of this process, it is possible that sensitized sexual arousal to Internet pornography may cause that sexual experience with a real partner may no longer trigger the sufficient dopamine release to produce and sustain sexual arousal and erection (Melis and Argiolas, 2011; Prause and Pfaus, 2015; Schultz, 1998). Prause and Pfaus suggested that "erectile problems may occur when real-life sexual stimulation does not match the broad content [accessible online]" (Prause and Pfaus, 2015). Human and animal studies also indicate that when expectations are not met (due to a negative prediction error), then such a "disappointing event" may cause that as a response certain activities in the mesolimbic dopaminergic system are inhibited (Bayer and Glimcher, 2005; Hart et al., 2014; Mauer-Vakil and Bahji, 2020; McClure et al., 2003; Sunsay and Rebec, 2014).

Similarly, addiction studies have also reported that cues explicitly paired with the absence of a drug reward can have marked inhibitory effects on dopamine release (Leyton and Vezina, 2014). Consistent with a negative prediction error, Banca et al. reported a decrease in ventral striatal activity in response to the omission of an expected sexual image (following a conditioned cue) (Banca et al., 2016). Banca et al. also found that, compared with healthy controls, compulsive Internet pornography users had enhanced preference for conditioned cues (abstract patterns) related to sexual images (Banca et al., 2016). This finding suggests that Internet pornography users can become "sensitized to cues" that are unrelated to sexual content and produce associations that can be extremely challenging to extinguish (Banca et al., 2016). These impairments of sexual arousal and erectile difficulties in intimate relationships but not with sexually explicit materials suggest that the enhanced desire scores were specific to the explicit cues and not generalized heightened sexual desire (Voon et al., 2014, p 5). Another study found enhanced "attentional bias" in compulsive Internet pornography users similar to that observed in studies of drug cues in addiction disorders (Mechelmans et al., 2014; Weinstein and Lejoyeux, 2010), which provides support for an incentive motivation theory of addiction underlying the aberrant response toward sexual cues in CSB (compulsive sexual behavior) and reward systems deficits (Burtăverde et al., 2021; Dackis and O'Brien, 2005; Kühn and Gallinat, 2014; Leeman and Potenza, 2013; Mauer-Vakil and Bahji, 2020; Mechelmans et al., 2014; Rosenberg and Feder, 2014).

COGNITIVE-AFFECTIVE DISTRESS AND PERSONALITY TRAITS RELATED TO PORNOGRAPHY CONSUMPTION

Recent findings suggest that specific manifestations representing human relationships and communication characterized as feelings of connectedness, bonding, and being listened to create an atmosphere of self-forgiveness and acceptance are inversely related to hypersexual behavior (Sniewski et al., 2018). Other findings indicate that men who manifest hypersexuality have also been found to be more depressed and anxious, and prone to substance abuse (Bancroft et al., 2003; Schachner and Shaver, 2004).

In this context, the so-called problematic pornography use has been described, which refers to a pattern of pornography viewing that causes significant distress to an individual and may negatively affect personal identity and social relationships (Bancroft and Vukadinovic, 2004; Burtăverde et al., 2021; Davis, 2001; Frangos et al., 2010; Kraus et al., 2018; Pizzol et al., 2016; Sniewski and Farvid, 2020; Young, 1998).

Several findings also show that some individuals may use pornography and other forms of sexual stimulation with the purpose of distracting their attention from emotional and contextual stressors (Bőthe et al., 2020, 2021). Other findings also show that tendencies to use online pornography may be related to reactive stress response and may be used for a temporary escape, as well as for coping with discomfort feelings (Cooper et al., 1999) and reduction of anxiety (Giugliano, 2009; Kafka, 1993; Marshall and Marshall, 2000). Developmental findings also show that adults with adverse stressful childhood experiences tend to have anxious attachment and sexual compulsion (Aaron, 2012).

In this context, research indicates a reciprocal relationship between mood regulation and Internet pornography use, suggesting that some people may use Internet pornography to cope with negative emotions (Laier and Brand, 2017; Willoughby et al., 2019), and the use of pornography may be manifested in relation to anxiety and depression (Burtăverde et al., 2021; Efrati and Gola, 2018; Frangos et al., 2010; Goodman, 1997; Laier et al., 2013; Levin et al., 2012; Mauer-Vakil and Bahji, 2020; O'Sullivan et al., 2014; Pepping et al., 2018).

Some studies also reported that pornography use might be associated with lower levels of sexual wellbeing (Angst, 1998; Campbell and Kohut, 2017; Vaillancourt-Morel and Bergeron, 2019) and various feelings of personal anxiety, insecurity, and moral conflicts (Bancroft and Vukadinovic, 2004; Davis, 2001; Duffy et al., 2016; Frangos et al., 2010; Grubbs et al., 2019a, 2019b; Hooshmand et al., 2012; Young, 1998). Especially, the moral conflict as related to pornography exposure has been found in individuals who declare their religious belief (Collins et al., 2004; Grubbs et al., 2010, 2015, 2019a, 2019b; Nie, 2021; Patterson and Price, 2012; Perry, 2018; Štulhofer et al., 2016).

These negative feelings can lead to even greater helplessness to eliminate the consumption of pornography and may lead an individual to a state of greater frustration and concern (Young et al., 2000). In addition, the connection between religiosity and a culture emphasizing sexual purity can exacerbate this negative influence, including feelings of great guilt (Grubbs et al., 2015). These findings suggest a relationship between perceived addiction to Internet pornography and psychological suffering related to a moral conflict and incongruency due to guilty feelings (regardless of an individual's religiosity) (Bradley et al., 2016; O'Sullivan et al., 2014).

These experienced moral conflicts, moral incongruency, and guilty feelings are specifically linked to romantic fantasies and romantic love, which are in a strong contrast to pornography and pornographic scenarios, and reported findings indicate that engaging in dominant and coercive behaviors seen in pornographic films may negatively affect sexual identity (Brown and L'Engle, 2009; Wright, 2013). In this context, for example, Papadopoulos (2010) suggests that the viewing of pornography in childhood and adolescence negatively influences forming of sexual identity and imposes gender stereotypes in a way that objectifies their bodies and commodifies their sexuality, putting girls and boys under pressure to emulate polarized and unrealistic gender stereotypes of the stereotypic pornographic roles. Papadopoulos (2010) also suggests that pornography has a profound impact, particularly on girls and young women by creating a culture of sexualization and body dissatisfaction. This finding is in agreement with increasing numbers of the plastic surgeries among young females focused on breast operations and labiaplasty (Crouch et al., 2011), and a similar trend was observed also in men regarding penis surgery (Marra et al., 2020). Similarly, Mattebo et al. (2013) suggest that pornography places emphasis on physical perfection that few people can measure up to, and this feeds into a wider cultural climate where gender norms are played out through (often unobtainable) physical ideals young women are exposed to, such as a female's value being based on their physical appearance, leading to low self-esteem, self-loathing, and a desire to change one's body.

In this context, the pornography-related body perfectionism might be linked to narcissistic tendencies as some studies indicate that sex addiction is positively related to narcissism (Andreassen et al., 2018; Kafka, 2010; Kasper et al., 2015; Raymond et al., 2003), the so-called sexual narcissism (Kasper et al., 2015), which frequently leads to engaging with many sexual partners (Widman and McNulty, 2010) and Internet pornography (Kasper et al., 2015). For example, a large-scale study by Andreassen et al. (2018) including 23,533 adults reported an association between narcissism and sex addiction.

In summary, these findings show that stress, anxiety, and depression are strongly related to pornography consumption and conflicting emotional experiences as well as identity problems significantly enhance vulnerability to addictive sexual behavior–related pornographic experiences.

CONCLUSIONS AND PERSPECTIVES FOR FURTHER RESEARCH

Recent findings indicate that excessive pornography consumption may significantly negatively affect the sexual development in childhood and adolescence by influencing unrealistic gender stereotypes and patterns of behavior, and although it still does not represent a diagnostic entity it may have serious mental health consequences (Block, 2008; Burtăverde et al., 2021; Mauer-Vakil and Bahji, 2020; O'Sullivan et al., 2014; Ross et al., 2012). According to current *DSM-5*, dependence on online pornography does not represent a separate syndrome, but as some researchers and clinicians suggest, it can be included as a part of a hypersexual disorder (Kafka, 2010). According to the *ICD-10*, "excessive consumption of pornography" is diagnostically close to "excessive sexual urge" also denoted as hypersexuality (F52.7) representing enhanced but "a nondeviant" manifestations of sexual behavior. In addition to *ICD-10*, *ICD-11* disease classification of excessive pornography consumption is described in the context of "impulse control disorder." This form of the disorder is "characterized by a persistent pattern of failure to control intense, repetitive sexual impulses, or urges leading to repeated sexual behavior." According to *ICD-11*, "this pattern of failure to control intense sexual impulses or compulsions and the resulting repetitive sexual behavior manifests itself over an extended period of time" and causes significant suffering or significant disruptions in personal, family, and social life (Kafka, 2010; Kraus et al., 2018).

Although addiction to pornography is still not recognized as a disorder, it may represent severe social and epidemiological problem, mainly because some findings suggest that the viewing pornography in childhood and adolescence may negatively influence forming of sexual identity and relationships due to unrealistic gender stereotypes of pornographic roles, relations, physical perfectionism, and unrealistic body image (Mattebo et al., 2013; Papadopoulos, 2010). In this context, pornography creates unnatural and unreal culture of "sexualization" and body "dissatisfaction," which is likely related to increasing numbers of the plastic surgeries among young females focused on breast and labiaplasty surgery, which are expected to create physical ideals of young women (Crouch et al., 2011; Mattebo et al., 2013), and a similar trend was observed also in men (Marra et al., 2020). This pornography-related body perfectionism may be linked to narcissistic tendencies, and some studies indicate that sex addiction is positively related to narcissism (Andreassen et al., 2018; Kafka, 2010; Kasper et al., 2015; Raymond et al., 2003; Widman and McNulty, 2010).

As related to pornography, the physical perfectionism may implicate increased prevalence of narcissistic tendencies and personality disorders in population with later consequences in individual ontogenesis, when this artificial body perfectionism will be lost. We can expect severe consequences of the Internet pornography exposure and addiction at approximately from 10 to 30 years from now, when generations mostly affected by pornography consumption will experience body image dissatisfaction at their middle age or later, which may influence future epidemic of mental disorders mainly depression and anxiety, and increased suicidal tendencies in population.

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