

Critical Review

Attitudes and Sexual Behaviours Associated With Adolescent Online Pornography Consumption: A Critical Commentary During COVID-19

Marika Guggisberg^{1*}, Annie Holt²

¹Queensland Centre for Domestic & Family Violence Research, School of Nursing Midwifery and Social Sciences, CQUniversity Australia, Australia

²School of Medicine, Faculty of Medicine, Nursing, Midwifery and Health Sciences, University of Notre Dame, Fremantle, Australia
E-mail: m.guggisberg@cqu.edu.au

Received: 23 May 2022; **Revised:** 31 August 2022; **Accepted:** 5 September 2022

Abstract: Adolescents commonly seek out pornography, which affects their attitudes and behaviours. Furthermore, the current COVID-19 pandemic saw an unprecedented increase in pornography consumption worldwide. However, adults appear generally reluctant to engage children and youth in discussions about online pornography consumption. This article provides a critical commentary on issues related to pornography use, with a focus on attitudes, beliefs, and behaviours as part of the sexual development of adolescents. It aims to raise awareness and recommend implementing prevention and intervention education about adolescent online pornography consumption and associated harms. To this end, a narrative review of the academic literature was conducted. The paper discusses the intentional use of pornography by adolescents, potential benefits, gender differences, theoretical considerations, and effects associated with sexual attitudes, beliefs, and behaviours. It suggests that online pornography use is an important contemporary social issue that requires attention. Recommendations include the need for education about the negative social, behavioural, and legal impacts of pornography use. Openly discussing sexual consent is critically important and a way to engage adolescents in prevention efforts. Additional research is needed to better understand the nature, extent, and impact of online pornography consumption on adolescents with regard to age, gender, and specific cultural backgrounds.

Keywords: adolescents, adolescent development, COVID-19, perceived realism, problematic pornography use, rape-myth acceptance, school, teenager

1. Introduction

Adolescents nowadays lead digital lives. They express themselves and interact with others through online networks making the Internet a central feature of their identity construction, which has increased during the COVID-19 pandemic (Ellis et al., 2020). This includes adolescents deliberately seeking out online pornography, which DeKeseredy and Corsianos (2016) referred to as “the 800-pound gorilla in the room” (p. viii). Scholars, clinicians, and policymakers agree that online pornography consumption is on the rise (de Alarcón et al., 2019; Mead & Sharpe, 2020) during a critical time of adolescent sexual development (Waterman et al., 2022).

The current COVID-19 pandemic saw an unprecedented increase in pornography consumption internationally

(Awan et al., 2021; Grubbs et al., 2022). Lockdown requirements, physical isolation, boredom, and related stress have been associated with a significant rise in pornography consumption (Grubbs et al., 2022) including pathological use (Awan et al., 2021). In this regard, Grubbs and colleagues (2022) made reference to “problematic pornography use (PPU)” (p. 123) indicating that the motivation for pornography consumption that is associated with coping with negative emotions such as anxiety, depression, and stress is particularly concerning because it is indicative of dysregulated (excessive) and compulsive use. We use the definition of PPU provided by Grubbs and colleagues (2022) as “problems regulating, reducing, or controlling the amount of pornography consumed” (p. 126). Negative affect among adolescents during COVID-19 has been reported in the literature (see for example, Ellis et al., 2020). Furthermore, recent research indicated that PPU is particularly relevant for boys who attempt to cope with emotions and prepubescent children in general (Efrati, 2020).

The social acceptability of pornography use has grown rapidly worldwide over the past years. High-speed network services and the availability of mobile internet removed previous barriers to accessing pornography as an acceptable form of recreation among the young demographic (Mead & Sharpe, 2020). Given these new developments, concerns have been raised in the literature about negative impacts (Hilton, 2013; Svedin et al., 2011; Waterman et al., 2022). The largest supplier of commercially produced pornography is Pornhub, which streamed over 115 billion videos last year to a global audience of an estimated one billion viewers, which suggests a high frequency of pornography use (Mead & Sharpe, 2020). Unsurprisingly, Pornhub indicated increased pornography use, and internet search data on pornography rose during the course of the COVID-19 pandemic (Grubbs et al., 2022). Given that some contradictions have been reported, we believe it is necessary to review the ramifications of pornography consumption on adolescents. In this paper, we investigate adolescents’ sexual attitudes, beliefs, and behaviours when consuming pornography.

The aim of this paper is to raise awareness of online pornography among adolescents and its potential for harmful effects. It intends to inform professionals about the need for prevention education and early intervention for adolescents who are vulnerable to identified harms reported in the literature. The key themes identified in this article were derived from a narrative analysis of the academic literature following Baethge et al. (2019) and Ferrari (2015) who developed best practice recommendations for narrative reviews. Narrative reviews have numerous advantages including being popular among readers and allowing a broader scope when compared to systematic reviews (Baethge et al., 2019). They are desirable and better suited when a topic is examined in a wider way and have the potential to influence clinicians in their therapeutic approach as well as research (Baethge et al., 2019).

First, the definition of pornography is examined. This is followed by drawing attention to the important distinction of ‘exposure to’ versus the ‘consumption of’ online pornography and gender differences. Neurobiological effects of regular online consumption are explored, followed by a discussion about attitudes, beliefs, and behaviours that are influenced by online pornography. Finally, future directions are discussed, including the need for prevention and intervention efforts among parents, educators, school psychologists, and other school administrators.

1.1 Pornography

Pornography can easily be accessed by minors, which has become a topic of scholarly interest in recent years given that adolescence is a time of particular sexual development and curiosity (Waterman et al., 2022; Weber et al., 2012). Weber and colleagues (2012) argued that among adolescents, pornography use has become “an everyday phenomenon” among youth living in Western countries (p. 410).

The concept of pornography is not easily defined and there is no universally accepted conceptualisation of the term (Rasmussen et al., 2015). According to previous studies (e.g., Peter & Valkenburg, 2016; Vandenbosch et al., 2018; Weber et al., 2012), we define pornography as images that are produced by users or professionals typically depicting sexual behaviours with the intent to sexually arouse the viewer. This includes online pornography. The distinction between online and offline pornography is that originally available print materials such as magazines and home videos appear outdated. Nowadays, pornography is abundantly available over the Internet, which allows accessing videos on specific sites (Hall & Hearn, 2018).

Not only is online pornography easily accessible, but it is often available for free and can be accessed anonymously (Grubbs et al., 2022; Rasmussen et al., 2015) with no age verification (Shor, 2019). The amount of online pornography is amassing rapidly with new sites being created daily, which allows bypassing internet filters that are on banned lists (Mead & Sharpe, 2020). The sheer volume of online pornography is related to the technology that takes advantage of precise

marketing and makes pornography specifically appealing to the user (Powell & Henry, 2017). There are no restrictions on the genre of pornography that can be viewed (DeKeseredy & Hall-Sanchez, 2018) with previously placed protections between the viewer and the online material having been gradually eliminated (Mead & Sharpe, 2020). The vast majority of pornography is of heterosexual content made by men for men, which uses predictable patterns of showing degrading, humiliating, and objectifying content with explicit sex scenes involving forced vaginal and anal intercourse that are readily available on the Internet (Bradfield, 2015; Bridges, 2019; DeKeseredy & Corsianos, 2016; DeKeseredy & Hall-Sanchez, 2018; Malamuth, 2018; Powell & Henry, 2017; Quadra et al., 2017; Shor, 2019; Waterman et al., 2022).

The literature often distinguishes between unintentional and intentional use of pornography (Peter & Valkenburg, 2016; Quadra et al., 2017). Our focus here is on repeated and intentional consumption of online pornography. Lifetime prevalence rates of adolescents who intentionally seek out pornography have been reported to be as high as 98% (Weber et al., 2012) with consistent findings of higher rates for boys when compared to girls (Peter & Valkenburg, 2016; Waterman et al., 2022). This suggests that a substantial proportion of adolescents intentionally seek out pornography. Religiosity, parental restriction along with installed filter software that blocked certain content were associated with less online pornography use (Peter & Valkenburg, 2016). Following Quadra et al. (2017), this analysis uses the term *pornography consumption* and *pornography use* interchangeably indicating intentional viewing of online pornography.

1.2 Potential benefits

Benefits of pornography use were noted by some scholars. These include that adolescents can learn from the depictions of specific sexual interactions, making it a sexual educational source (Boniel-Nissim et al., 2020; Vandenbosch et al., 2018), and assisting in developing sex-positive attitudes and sexuality knowledge (Mead & Sharpe, 2020; Peter & Valkenburg, 2016). Scholars who emphasise the benefits of pornography use often reject education about negative effects (Mead & Sharpe, 2020) and dismiss associated harms (Hilton, 2013). We believe that it is important to be aware of negative and harmful effects such as the addictive potential, and impacts on attitudes, beliefs, and behaviours. In what follows, we provide a brief discussion on gender differences in pornography use.

1.3 Gender differences

While many females consume online pornography, there are important gender differences. Research consistently indicates that more boys and men than girls and women consume online pornography (Boniel-Nissim et al., 2020; Bridges, 2019; de Alarcón et al., 2019; Grubbs et al., 2022; Malamuth, 2018; Rasmussen et al., 2015; Schneider, 2004; Shor, 2019; Stanley et al., 2018; Svedin et al., 2011; Waterman et al., 2022) with the average age of first exposure of adolescents being around 11 years of age (DeKeseredy & Corsianos, 2016; Foubert et al., 2019; Hall & Hearn, 2018). Rothman et al. (2015) reported that nearly one in four 10-15-year-olds have intentionally viewed pornography with 66% of boys and 39% of girls by the age of 14 years. Furthermore, researchers agree that the age of first online pornography use is declining, while the frequency of pornography use generally increasing (Boniel-Nissim et al., 2020; Mead & Sharpe, 2020).

Svedin and colleagues (2011) in a large sample of Swedish high school students examined the frequency of intentional pornography use. Of the 4,026 respondents (52.8% females), only about 2% of boys had never consumed pornography versus 25.5% of girls. The rate of infrequent use (monthly or less) was highest among both genders (54.8% of boys and 36.4% of girls). Particular gender differences were reported with weekly (28.6% of boys versus 1.5% of girls) and daily consumption (10.5% of boys versus 0.2% of girls).

Similarly, Weber and colleagues (2012) in an online survey among 352 German adolescents (59% males and 41% females) aged between 16 and 19 (mean age of 17.3 years) found significant gender differences in pornography consumption. Nearly half of male participants (47%) reported watching pornography daily or several times daily. This is nearly 16 times the rate of female participants where only 3% of girls indicates consuming pornography daily or several times daily. Less frequent use was also vastly different with 30% of males versus 12% of females reporting weekly consumption. Only 7% of males indicated to have never consumed pornography whereas 48% of females reported no pornography consumption. These studies indicate vast gender differences between those who have no, low or high-frequency use of pornography.

Some boys and girls have been found to access pornography while they are at school on a desktop computer or

smartphone (Mead & Sharpe, 2020; Sun et al., 2016). In fact, this behaviour has been reported as being perceived as 'typical' between the ages of 13-15 years (Hall & Hearn, 2018, p. 3). Rothman et al. (2015) in a qualitative study of 23 adolescents (60% females) reported intentional pornography use during school hours. Negative effects were reported in impacting the school environment and students being expelled. Some girls reported that boys watch pornography on the school grounds and commence "slapping girls' butts, [and] grabbing their boobs" (p. 742). Respondents indicated that even though pornography sites are blocked, boys know how to use proxy servers to unblock them. In fact, overriding parental controls have been found to be common practice among adolescents (Mead & Sharpe, 2020).

Furthermore, males more often view online pornography that depicts anal intercourse, fellatio, group sex, and violent genres than females (DeKeseredy & Corsianos, 2016; Quadra et al., 2017; Shor, 2019). Not only do males consume online pornography more often than females (Rostad et al., 2019; Schneider, 2004; Stanley et al., 2018; Ybarra & Thompson, 2018), but they also tend to spend more time viewing and being preoccupied with fantasies about what they watched (Peter & Valkenburg, 2016). A number of theories have been developed in this regard with one of the most prominent being the sexual script theory, which will be discussed below.

1.4 Sexual script theory

Theoretical frameworks associated with the study of adolescent pornography consumption include the sexual script's approach (Mead & Sharpe, 2020; Peter & Valkenburg, 2016; Rothman et al., 2015; Sun et al., 2016; Vandenbosch et al., 2018; Waterman et al., 2022; Weber et al., 2012). Sexual scripts develop from pornography consumption (Awan et al., 2021; Mead & Sharpe, 2020; Sun et al., 2016; Vandenbosch et al., 2018) whereby viewers' attitudes and beliefs about sexual partners and behaviours are developed and internalised with a positive relationship having been found in many studies between the frequency of pornography use and specific sexual acts watched in pornography (Bridges et al., 2016; Sun et al., 2016; Vandenbosch et al., 2018; Waterman et al., 2022). This occurs as a result of unconscious changes in the viewer's thoughts and behaviours via the dopamine pathways in the brain's reward centre (de Alarcón et al., 2019; Mead & Sharpe, 2020; Sklenarik et al., 2019).

Wright (2011) theorised that sexual scripts are acquired, activated, and applied through the 3AM (acquire, activate, actualize) sexual socialisation model. The theoretical framework indicates that sexual scripts are acquired, which are activated by subsequent consumption of pornography and then applied behaviourally. The viewer's belief system is influenced by gender stereotypes and male power through acquisition. Then, activation occurs through already established higher-order sexual scripts whereby generalisation occurs about females and males and their sexual engagement. Following this, application occurs after sexual scripts have been acquired and activated in the actualisation phase where the learned behaviour is acted out in real life (e.g., male dominance, female objectification, degradation, and sexual violence [Awan et al., 2021; Marshall et al., 2021; Sun et al., 2016]). Consequently, sexual attitudes and behaviours are influenced by pornography consumption (Awan et al., 2021; Bridges et al., 2016; Waterman et al., 2022; Wright, 2011). The more frequently someone consumes pornography the more readily these sexual scripts are accessible and guide the person's sexual behaviours (Sun et al., 2016), including sexual aggression (Vera-Gray et al., 2021).

Underlying neurobiological mechanisms are involved in cognitive activities that result in impulse control difficulties, which develop as the consumption of pornography is repeated (Awan et al., 2021; de Alarcón et al., 2019; Sklenarik et al., 2019). In this regard, it is important to note that high-speed Internet pornography is vastly different to pornographic images of the past which did not have such a grave impact on the viewer (Bridges et al., 2016). Current online pornography provides a supernormal stimulus resulting in chronically elevated dopamine levels that occur from constant sexual arousal (Hilton, 2013). It is not unusual for adolescent boys to view an unending supply of online pornographic content in an attempt to search and seek the 'right clip' in anticipation of what the next clip will bring. This behaviour creates a positive feedback mechanism stimulating reward centres in the brain, which results in a powerful reinforcement effect (Awan et al., 2021; Mead & Sharpe, 2020). The neuroplasticity of the developing brain is most prone to addiction and sexual conditioning at this vulnerable age. Addiction, neuroplasticity, and sexual arousal reinforce both conscious and unconscious sexual conditioning (Voon et al., 2014). Reduced control over impulses weakens behavioural regulations and creates motivations that reinforce pornography use resulting in a tendency to look longer and evaluate pornography more positively (Sklenarik et al., 2019). Expectations about sexual acts and what behaviours partners should engage in are developed and reinforced (Bridges et al., 2016; Mead & Sharpe, 2020). Furthermore, cognitive framing occurs when the viewer's perception is that what is viewed becomes believed to be

normative behaviour (Rostad et al., 2019). Consequently, the young viewer has conditioned to the pornographic images consumed that provide cognitive scripts which are “behavioral guidelines for sexual interactions” (Shor, 2019, p. 1021). It is not surprising, then, that users of online pornography become desensitised to sexual behaviours that have previously been believed to be unusual (Bridges et al., 2016). Concerns have been raised in the literature about adverse outcomes of pornography consumption, which will be discussed below.

1.5 Concerns raised in the literature

The scientific literature indicated increasing concerns about repeated pornography consumption expressed by educators, social and health professionals, as well as researchers (Boniel-Nissim et al., 2020; Mead & Sharpe, 2020). Adverse outcomes include desensitisation (de Alarcón et al., 2019), normalisation, rape-myth acceptance along with gender-stereotypical attitudes (Boniel-Nissim et al., 2020; Efrati, 2020; Peter & Valkenburg, 2016; Rodenhizer & Edwards, 2019; Sun et al., 2016), and dating sexual violence (Mead & Sharpe, 2020; Rodenhizer & Edwards, 2019; Vera-Gray et al., 2021; Waterman et al., 2022). These issues will be further discussed below.

1.5.1 Desensitisation

Desensitisation effects have been observed in that consumers of online pornography indicate more permissive attitudes about sexual objectification and physical violence depicted in online pornography (Bridges et al., 2016; Hilton, 2013; Vera-Gray et al., 2021). For example, sexual engagement practices that previously were considered unusual have become normative, such as anal intercourse, double penetration, ass to mouth, and ejaculation on a woman’s face (Bridges et al., 2016). Furthermore, females being strangled during intercourse has become a popular experience among sexual partners. This desensitisation effect has been associated to pornography where strangulation is commonly depicted and believed to be a safe and pleasurable practice (Wright et al., 2021). Tolerance develops to behaviours observed with the consequence that adolescents’ expectations of depicted sexual behaviours between male and female partners are believed to be normal.

1.5.2 Normalisation

Given that most online pornography depictions sexually objectify and degrade women, a normalisation effect of violence against women is observed (Bridges, 2019; DeKeseredy & Corsianos, 2016; Palermo et al., 2019; Powell & Henry, 2017; Rodenhizer & Edwards, 2019; Rostad et al., 2019; Stanley et al., 2018). Adolescents are at a very vulnerable and impressionable age with a limited ability to differentiate between what is ‘normal’ and ‘abnormal’ sexual behaviour, which may not occur until their early to mid-twenties (Morelli et al., 2017).

Normalisation of sexual acts depicted in online pornography may result in the consumers’ reduced perception of harm (Bridges, 2019; DeKeseredy & Corsianos, 2016; Mead & Sharpe, 2020; Quadra et al., 2017; Rodenhizer & Edwards, 2019; Shor, 2019; Stanley et al., 2018) as a greater acceptance of gender stereotypes and rape-supportive attitudes have been observed (Hilton, 2013; Palermo et al., 2019; Rostad et al., 2019; Shor, 2019). In this regard, Bridges et al. (2016) referred to “pornography-normative” behaviour (p. 3).

In relation to sexual attitudes, consistent empirical evidence reported gender-stereotypical assumptions among pornography users, which include gender inequality beliefs, sexual objectification of females, and sexual power-imbalances (Efrati, 2020; Peter & Valkenburg, 2016; Vera-Gray et al., 2021; Waterman et al., 2022). A reciprocal relationship between online pornography consumption and gender stereotypes has been reported in the literature (Peter & Valkenburg, 2016). The use of pornography predicts gender-related stereotypical beliefs, influencing attitudes in relation to sexual engagement, and the perception that what is viewed is a realistic depiction of sexual interaction.

1.5.3 Rape-supportive attitudes

Numerous studies found a statistically significant relationship between online pornography consumption (violent and non-violent genres) and violence-supportive attitudes (Bridges, 2019; Efrati, 2020; Foubert et al., 2019; Malamuth, 2018; Palermo et al., 2019; Rodenhizer & Edwards, 2019; Stanley et al., 2018), which minimise and even justify rape. Scientific evidence shows that consuming online pornography is a contributing factor to rape-supportive attitudes with

greater tolerance of sexual violence toward women (de Alarcón et al., 2019; Efrati, 2020; Malamuth, 2018; Palermo et al., 2019; Rodenhizer & Edwards, 2019; Shor, 2019; Vera-Gray et al., 2021). Adolescents who consume online pornography appear to be more predisposed to sexual violence (Quadra et al., 2017; Vera-Gray et al., 2021) because they often use these depictions as educational tools on how to sexually interact (Mead & Sharpe, 2020; Shor, 2019). Distorted sexual attitudes develop through sexually degrading and violent acts depicted in online pornography, which are closely associated with a propensity to engage in sexually violent behaviours as lack of consent becomes assumed as realistic in the real world (Rodenhizer & Edwards, 2019).

1.5.4 Perceived realism

Adolescents are particularly vulnerable to understanding pornography as real because of a lack of real-life experience (DeKeseredy & Corsianos, 2016; Shor, 2019; Vandenbosch et al., 2018). Perceived realism influences online pornography consumers' beliefs, attitudes, and behaviours (Bradfield, 2015; Bridges, 2019; Foubert et al., 2019; Quadra et al., 2017; Sun et al., 2016; Vandenbosch et al., 2018; Ybarra & Thompson, 2018). Pornography consumption in adolescence may lead to beliefs that what is depicted represents reality resulting in expectations of specific sexual encounters that mimic the sexual behaviours in pornography, which some scholars (e.g., Vandenbosch et al., 2018) do not find problematic, whereas others do (e.g., Foubert et al., 2019; Rodenhizer & Edwards, 2019; Shor, 2019; Waterman et al., 2022). For example, girls may experience body-image difficulties impacting their self-esteem due to perceived decreased desirability (Boddy, 2020; Dogan & Yassa, 2019; Paslakis et al., 2022; Rasmussen et al., 2015).

Dogan and Yassa (2019) examined the motivating factors of 71 women who sought vulvar cosmetic surgery to improve their genital appearance. The quantitative study found that the main reason for seeking labiaplasty was due to a negative genital self-image. The researchers indicated that media influenced the dissatisfaction with genital appearance despite the knowledge that the genitalia was in a normal range. Pornography use was significantly related to dissatisfaction, where women internalised the genital ideal depicted along with negative comments from sexual partners, which impacted the women's sexual self-esteem.

Girls have been found to be negatively compared with female pornography performers by their boyfriends. It is concerning that labiaplasty is undertaken on girls as young as 13 years as a result of adolescent genital dissatisfaction, which is a growing trend worldwide (Boddy, 2020). Vandenbosch et al. (2018) in a longitudinal study in the Netherlands with 1,022 adolescents with a mean age of 15.13 years (53.8% were boys and 46.2% were girls), investigated attitudes and sexual behaviours related to pornography use. Results indicated that those adolescents who frequently consumed pornography were more likely to perceive the sexual behaviours as a realistic depiction of real-world sexual interactions. In this regard, Shor (2019) reported on an important study that examined 172 online pornography videos on Pornhub. The analysis examined the difference between female teenage versus female adult performers and their exposure to physical and sexual violence. The study found that these videos showed male performers caused intentional harm and pain such as hitting female performers, pulling their hair, strangling and/or forcefully penetrating them in addition to verbal aggression such as name-calling and threatening the women. Results indicated that 58% of the analysed videos showed non-consensual sexual interactions. When comparing female performers' ages, it was found that adolescent female performers were three times more likely to be subjected to visible violence and five times more likely to feature in depictions of forceful penetration showing male performers' intent to cause pain.

Shor (2019) indicated that the effect of displaying pleasure on degrading and sexually violent acts is particularly concerning. Female performers' positive responses indicate that they enjoy being humiliated and that male domination over females is legitimate. Clearly, watching such pornography in which teenage girls are degraded and forced into vaginal and/or anal intercourse is likely to have a particularly powerful effect on adolescent viewers. Numerous scholars indicated that online pornography consumption in addition to shaping attitudes and beliefs, tends to encourage sexually violent behaviours (see Foubert et al., 2019; Malamuth, 2018; Palermo et al., 2019) including re-enacting sexual acts viewed in these videos, particularly among adolescents (Shor, 2019). In this regard, Weber and colleagues (2012) reported that the male respondents in their study who used pornography "very frequently themselves give a higher estimate of the prevalence of pornography-like sexual activity" (p. 423) admitted using sexual coercion and even force with their partners.

1.5.5 Sexual coercion and sexual assault

Online pornography consumption may reach a point where it interferes with interpersonal relationships. This includes pathways into sexual and other forms of dating violence (Mead & Sharpe, 2020; Rodenhizer & Edwards, 2019; Waterman et al., 2022). Pornography use has been identified as a risk factor for sexual violence among dating partners (Rodenhizer & Edwards, 2019; Waterman et al., 2022) such as asking girlfriends to reenact scenes watched against their will. In fact, research consistently suggests that many females are pressured into imitating what their boyfriends have seen online (DeKeseredy & Corsianos, 2016; Foubert et al., 2019; Mead & Sharpe, 2020; Shor, 2019; Stanley et al., 2018; Ybarra & Thompson, 2018). Acting out pornographic scenes have been associated with intimate partner violence (Rodenhizer & Edwards, 2019), which includes dangerous sexual practices such as sexual strangulation (Mead & Sharpe, 2020; Wright et al., 2021).

Stanley and colleagues (2018) used an anonymous survey design among 4,564 teenagers aged between 14-17 years who consumed online pornography to investigate the impact on attitudes and behaviours. In addition, 91 interviews were conducted. Results indicated that teenage boys who viewed online pornography frequently were twice as likely as those who did not view online pornography to admit engaging in sexual coercion or even using physical force to obtain sexual intercourse.

Rostad et al. (2019) reported even more disturbing findings. In their US study with a large sample of year 10 high school students, the researchers found that boys watching violent pornography where females were forced into sexual acts, were between 1.84 and 6.04 (average 3.94) times more likely to perpetrate sexual violence against their girlfriends when compared to boys who did not view violent sexual pornography. Consequently, there is a strong association between sexually offending behaviours, pornography consumption, and rape-supportive attitudes.

There is no suggestion of a causal relationship between online pornography consumption and sexual assault (Bridges, 2019; DeKeseredy & Corsianos, 2016), and recent research has indicated a complex interaction between sexual attitudes and behaviours among adolescents (Waterman et al., 2022). However, online pornography certainly contributes to maintaining a culture that tolerates sexual and other forms of violence against women and girls (Powell & Henry, 2017; Rodenhizer & Edwards, 2019). Pornography consumption has been associated with social norm rule-breaking and delinquency (Peter & Valkenburg, 2016). Svedin and colleagues (2011) reported that in their large study among high school students, delinquency was positively related to frequent pornography use.

In regard to the perpetration of sexual violence, systematic reviews found consistently that pornography consumption was associated with coercive behaviours and rape (forced intercourse) (Peter & Valkenburg, 2016; Rodenhizer & Edwards, 2019). Unsurprisingly then, exposure to online pornography at an early age has been found to be associated with an increased risk of juvenile sexual perpetration (DeKeseredy & Corsianos, 2016; Efrati, 2020; Shor, 2019; Stanley et al., 2018; Ybarra & Thompson, 2018). Indeed, online pornography consumption was found to be greater among adolescent males who were convicted of sexual offences when compared to boys who were convicted of offences other than sexual assault (DeKeseredy & Corsianos, 2016). In this regard, it is important to address the underlying issue, which is the consumption of online pornography, and its associated harms.

Conversely, among girls, pornography consumption was related to sexual victimisation with a statistically significant association across several studies (Peter & Valkenburg, 2016). For example, Rothman and colleagues (2015) reported that girls in their study described being pressured by their boyfriends into watching pornography and performing certain acts seen as a force. Recreating certain acts (e.g., anal intercourse) were perceived as hurtful and feeling rape-like. Consequently, adopting a systemic and multilevel approach to address the above-discussed negative effects of adolescent pornography consumption is imperative. This should involve several groups, such as parents (Guggisberg & Dobozy, 2020; Rasmussen et al., 2015), professionals working in health, social services, and the criminal justice system (Mead & Sharpe, 2020), and adolescents themselves (Rodenhizer & Edwards, 2019; Waterman et al., 2022). In the following, we propose future directions to address adolescents' vulnerability to the negative effects of pornography consumption.

2. Future directions

Banning online pornography consumption is not a feasible approach; instead, educating adolescents and their parents is required. Parents should be offered information and tools to protect children from the adverse effects of unintentional (Guggisberg & Dobozy, 2020) and intentional pornography use (Boniel-Nissim et al., 2020; Mead & Sharpe, 2020). Rasmussen and colleagues (2015) argued that parents are likely unaware of how often boys consume pornography and how this shapes their attitudes and sexual behaviours. Parents, because they did not grow up with the technological advances children and young people are confronted with, may underestimate the negative effects of pornography consumption (Rasmussen et al., 2015), particularly if the behaviour is associated with an attempt to alleviate symptoms of anxiety, depression, and distress, along with boredom and isolation related to COVID-19. Rasmussen and colleagues (2015) advocated for parents to discuss pornography use and possible adverse outcomes openly with their children. It is important to take concerns raised in relation to PPU seriously given the suggestion of increased pornography consumption since the beginning of the COVID-19 pandemic.

Professional development training is urgently needed. Mead and Sharpe (2020) have commenced providing specific professional development training about the negative social, behavioural, and legal impacts of online pornography consumption to health care and social workers along with criminal justice professionals. Mead and Sharpe (2020) stated that “once seen, real violence and intimate partner violence shown in pornography cannot be unseen” (p. 9).

Adolescents require education to develop knowledge about the impact of pornography on attitudes and sexual behaviours (Rodenhizer & Edwards, 2019; Waterman et al., 2022). More education is required across different age groups as well as cultures to teach children and adolescents, what we call, *pornography literacy*. This includes discussing the neurobiological impact along with respectful relationships that involve sexual consent. We agree with other scholars that existing dating violence prevention programs should include pornography use (Mead & Sharpe, 2020; Rodenhizer & Edwards, 2019; Waterman et al., 2022). We argue that schools are uniquely situated to implement *pornography literacy*, which means integrating the consumption, creation, and distribution of pornography along with the need for respectful, coercion-free sexual relationships into the sex education curriculum. Current online eSafety school education programs focus overwhelmingly on cyberbullying and sexting, demonstrating a void in online education specifically on pornography and its role in perpetuating abnormal sexual behaviour ‘norms’ that include the objectification of women and girls. It is time to address this with an eSafety curriculum that moves beyond the taboo and confronts stigmata associated with pornography exposure and consumption.

Adolescents are a particularly vulnerable group given that they are still in the process of sexual neurodevelopment (de Alarcón et al., 2019; Mead & Sharpe, 2020). Pornography consumption has been identified as having the potential to adversely affect adolescents’ sexual development and functioning. In this regard, Ybarra and Thompson (2018) suggested that education about the harmful effects of online pornography should commence much earlier than the age of 15 years, when the first perpetration of sexual violence first occurred, given the association with perceived realism that affected attitudes and behaviours. Furthermore, increased knowledge and understanding may reduce perceptions of realism and violence-supportive attitudes. Those young people who are already caught up in harmful behaviours associated with PPU should receive appropriate intervention and education about its negative impacts (Ybarra & Thompson, 2018).

There are many screening and diagnostic tools for possible PPU, which keep expanding (Böthe et al., 2021; de Alarcón et al., 2019; Mead & Sharpe, 2020). School psychologists may utilise screening and diagnostic tools to identify potential problematic pornography consumption. For example, the Brief Pornography Screener (Kraus et al., 2020) assesses a person’s control or lack thereof in relation to pornography use. It is a 5-item brief assessment that measures the risk of compulsive pornography use with a cut-off score of 4 (range 0-10) in the past six months using a 3-point Likert-type scale. Higher scores indicate more problematic use. It is easily administered and provides important indications about potential compulsive pornography use. Specialist counselling may be required to assist all individuals directly and indirectly affected by teenagers’ online pornography consumption and associated sexual behaviours. Professional help can be beneficial for affected youth and their families.

Furthermore, professional development for practitioners to develop awareness, knowledge, and skills in relation to adolescent online pornography consumption may assist in more effective intervention. Professionals working with teenagers such as teachers, chaplains, school psychologists, and nurses are uniquely positioned to assist young people

to develop appropriate and respectful relationships. However, they may require training themselves in relation to online pornography consumption and its potential harms.

Further research is needed to understand the nature, extent, and impact of online pornography on adolescents. Pornography consumption generates brain changes and likely negative impacts on teenagers' brain development. Existing neural activity studies indicated concerning results with clear differences in the brain structure of those who use pornography compulsively and the control groups (de Alarcón et al., 2019). However, currently published research restricted participants to being adults, which is concerning given that the average age of boys who commence pornography use is in early adolescence or younger (Mead & Sharpe, 2020). Existing evidence clearly suggests a serious danger of pornography consumption becoming addictive with extensive social negative implications (de Alarcón et al., 2019). Consequently, further research is required to examine neurobiological impacts on adolescents' developing brains and how potentially concerning sexual behaviour such as PPU is associated with COVID-19-related motivational factors to alleviate symptoms of anxiety, depression, stress, loneliness, and boredom.

Further research should also examine peer-to-peer sexual assault in schools, which has been identified as a prevalent contemporary problem. In this regard, further longitudinal studies with adolescents who use pornography, including functional neuroimaging, may be informative in relation to the negative impacts of pornography with regard to sexual attitudes, beliefs, and behaviours.

3. Conclusion

This paper discussed an issue that is often omitted even though it has been referred to as the 'gorilla in the room' — the prevalent consumption of online pornography among adolescents and its potential for harmful effects. Without a doubt, online pornography is an important contemporary social issue. Adolescents' exposure to sexually abusive and violent content depicted in online pornography can be dangerous, as internalisation of degrading and sexually abusive images appear to affect their attitudes, beliefs, and behaviours.

Adolescents require strategies for dealing with online pornography and to be enabled to discuss their concerns about sexual behaviours that fail to involve coercion-free consent. Teachers, chaplains, school psychologists and nurses are uniquely positioned to raise awareness of the potentially harmful impacts of online pornography consumption. During sexuality education, open discussions could examine attitudes and behaviours being influenced by watching women being degraded, physically abused, and raped. Conversations could take place about how online pornography is an example of gender and power and how greater accountability of perpetrators and protection of victim/survivors can be achieved. It is critically important that adolescents be given the opportunity to develop *pornography literacy* as part of sexuality education, which should become part of the school curriculum.

While we attempted to include the most relevant information in this critical analysis, it is possible that some articles may have been missed. Additionally, further research may provide evidence of research translation where pornography literacy has been included into sexuality education and specific evaluation of prevention programs for adolescents. Research and practice applications require constant identification of gaps in current knowledge and appropriate funding to address the harms identified in this article.

Acknowledgment

We would like to thank Dr Eva Dobozy for reviewing earlier drafts of this manuscript and for her valuable comments.

Conflict of interest

The authors have no conflict of interest to disclose.

References

- Awan, H. A., Aamir, A., Diwan, M. N., Ullah, I., Pereira-Sanchez, V., Ramalho, R., Orsolini, L., de Filippis, R., Ojeahere, M. I., Ransing, R., Vadsaria, A. K., & Virani, S. (2021). Internet and pornography use during the COVID-19 pandemic: Presumed impact and what can be done. *Frontiers in Psychiatry, 12*, 623508. <https://doi.org/10.3389/fpsy.2021.623508>
- Baethge, C., Goldbeck-Wood, S., & Mertens, S. (2019). SANRA- a scale for the quality assessment of narrative review articles. *Research Integrity and Peer Review, 4*, 5. <https://doi.org/10.1186/s41073-019-0064-8>
- Boddy, J. (2020). Re-thinking the zero tolerance approach to FGM/C: The debate around female genital cosmetic surgery. *Current Sexual Health Reports, 12*, 302-313. <https://doi.org/10.1007/s11930-020-00293-1>
- Boniell-Nissim, M., Efrati, Y., & Dolev-Cohen, M. (2020). Parental mediation regarding children's pornography exposure: The role of parenting style, protection motivation and gender. *The Journal of Sex Research, 57*(1), 42-51. <https://doi.org/10.1080/00224499.2019.1590795>
- Böthe, B., Tóth-Király, I., Demetrovics, Z., & Orosz, G. (2021). The short version of the Problematic Pornography Consumption Scale (PPCS-6): A reliable and valid measure in general and treatment-seeking populations. *Journal of Sex Research, 58*(3), 342-352. <https://doi.org/10.1080/00224499.2020.1716205>
- Bradfield, K. L. (2015). *Improving sexual literacy* [Unpublished master's thesis]. Curtin University
- Bridges, A. J. (2019). Pornography and sexual assault. In W. T. O'Donohue & P. A. Schewe (Eds.), *Handbook of sexual assault and sexual assault prevention* (pp. 129-150). Springer Cham. https://doi.org/10.1007/978-3-030-23645-8_8
- Bridges, A. J., Sun, C. F., Ezzell, M. B., & Johnson, J. (2016). Sexual scripts and the sexual behavior of men and women who use pornography. *Sexualization, Media, & Society, 2*(4), 1-14. <https://doi.org/10.1177/2374623816668275>
- de Alarcón, R., de la Iglesia, J. I., Casado, N. M., & Montejo, A. L. (2019). Online porn addiction: What we know and what we don't—A systematic review. *Journal of Clinical Medicine, 8*(1), 91. <https://doi.org/10.3390/jcm8010091>
- DeKeseredy, W. S., & Corsianos, M. (2016). *Violence against women in pornography*. Routledge.
- DeKeseredy, W. S., & Hall-Sanchez, A. (2018). Thinking critically about contemporary adult pornography and woman abuse. In W. S. DeKeseredy & M. Dragiewicz (Eds.), *Routledge handbook of critical criminology* (2nd ed., pp. 280-294). Routledge. <https://doi.org/10.4324/9781315622040>
- Dogan, O., & Yassa, M. (2019). Major motivators and sociodemographic features of women undergoing labiaplasty. *Aesthetic Surgery Journal, 39*(12), NP517-NP527. <https://doi.org/10.1093/asj/sjy321>
- Efrati, Y. (2020). Problematic and non-problematic pornography use and compulsive sexual behaviors among understudied populations: Children and adolescents. *Current Addiction Reports, 7*(1), 68-75. <https://doi.org/10.1007/s40429-020-00300-4>
- Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science, 52*(3), 177-187. <https://doi.org/10.1037/cbs0000215>
- Ferrari, R. (2015). Writing narrative style literature reviews. *Medical Writing, 24*(4), 230-235. <https://doi.org/10.1179/2047480615Z.0000000000329>
- Foubert, J. D., Blanchard, W., Houston, M., & Williams, R. R., Jr. (2019). Pornography and sexual violence. In W. T. O'Donohue & P. A. Schewe (Eds.), *Handbook of sexual assault and sexual assault prevention* (pp. 109-127). Springer Cham. https://doi.org/10.1007/978-3-030-23645-8_7
- Grubbs, J. B., Perry, S. L., Weinandy, J. T. G., & Kraus, S. W. (2022). Pornemic? A longitudinal study of pornography use before and during the COVID-19 pandemic in a nationally representative sample of Americans. *Archives of Sexual Behavior, 51*, 123-137. <https://doi.org/10.1007/s10508-021-02077-7>
- Guggisberg, M., & Dobozy, E. (2020). Educated women as gatekeepers to prevent sexual exploitation of children. In J. A. Jaworski (Ed.), *Advances in sociology research* (Vol. 29, pp. 131-149). Nova Science Publishers.
- Hall, M., & Hearn, J. (2018). *Revenge pornography: Gender, sexualities and motivation*. Routledge.
- Hilton, D. L., Jr. (2013). Pornography addiction – a supranormal stimulus considered in the context of neuroplasticity. *Socioaffective Neuroscience & Psychology, 3*, 20767. <http://dx.doi.org/10.3402/snp.v3i0.20767>
- Kraus, S. W., Gola, M., Grubbs, J. B., Kowalewska, E., Hoff, R. A., Lew-Starowicz, M., Martino, S., Shirk, S. D., & Potenza, M. N. (2020). Validation of a Brief Pornography Screen across multiple samples. *Journal of Behavioral Addictions, 9*(2), 259-271. <https://doi.org/10.1556/2006.2020.00038>
- Malamuth, N. M. (2018). "Adding fuel to the fire"? Does exposure to non-consenting adult or to child pornography increase risk of sexual aggression? *Aggression and Violent Behavior, 41*, 74-89. <https://doi.org/10.1016/j.avb.2018.02.013>

- Marshall, E. A., Miller, H. A., & Bouffard, J. A. (2021). Bridging the theoretical gap: Using sexual script theory to explain the relationship between pornography use and sexual coercion. *Journal of Interpersonal Violence*, 36(9-10), NP5215-NP5238. <https://doi.org/10.1177/0886260518795170>
- Mead, D., & Sharpe, M. (2020). Aligning the “Manifesto for a European research network into problematic usage of the Internet” with the diverse needs of the professional and consumer communities affected by problematic usage of pornography. *International Journal of Environmental Research and Public Health*, 17(10), 13462. <https://doi.org/10.3390/ijerph17103462>
- Morelli, M., Bianchi, D., Baiocco, R., Pezzuti, L., & Chirumbolo, A. (2017). Sexting behaviors and cyber pornography addiction among adolescents: The moderating role of alcohol consumption. *Sexuality Research and Social Policy*, 14(2), 113-121. <https://doi.org/10.1007/s13178-016-0234-0>
- Palermo, A. M., Dadgardoust, L., Arroyave, S. C., Vettor, S., & Harkins, L. (2019). Examining the role of pornography and rape supportive cognitions in lone and multiple perpetrator rape proclivity. *Journal of Sexual Aggression*, 25(3), 244-257. <https://doi.org/10.1080/13552600.2019.1618506>
- Paslakis, G., Actis, C. C., & Mestre-Bach, G. (2022). Associations between pornography exposure, body image and sexual body image: A systematic review. *Journal of Health Psychology*, 27(3), 743-760. <https://doi.org/10.1177/1359105320967085>
- Peter, J., & Valkenburg, P. M. (2016). Adolescents and pornography: A review of 20 years of research. *Journal of Sex Research*, 53(4-5), 509-531. <https://doi.org/10.1080/00224499.2016.1143441>
- Powell, A., & Henry, N. (2017). *Sexual violence in a digital age*. Palgrave Macmillan.
- Quadra, A., El-Murr, A., & Latham, J. (2017). *The effects of pornography on children and young people: An evidence scan* [Research report]. Australian Institute of Family Studies. <https://aifs.gov.au/publications/effects-pornography-children-and-young-people>
- Rasmussen, E. E., Ortiz, R. R., & White, S. R. (2015). Emerging adults’ responses to active mediation of pornography during adolescence. *Journal of Children and Media*, 9(2), 160-176. <https://doi.org/10.1080/17482798.2014.997769>
- Rodenhizer, K. A. E., & Edwards, K. M. (2019). The impacts of sexual media exposure on adolescent and emerging adults’ dating and sexual violence attitudes and behaviors: A critical review of the literature. *Trauma, Violence, & Abuse*, 20(4), 439-452. <https://doi.org/10.1177/1524838017717745>
- Rostad, W. L., Gittins-Stone, D., Huntington, C., Rizzo, C. J., Pearlman, D., & Orchowski, L. (2019). The association between exposure to violent pornography and teen dating violence in grade 10 high school students. *Archives of Sexual Behavior*, 48(7), 2137-2147. <https://doi.org/10.1007/s10508-019-1435>
- Rothman, E. F., Kaczmarzsky, C., Burke, N., Jansen, E., & Baughman, A. (2015). “Without porn ... I wouldn’t know half the things I know now”: A qualitative study of pornography use among a sample of urban, low-income, Black and Hispanic youth. *Journal of Sex Research*, 52(7), 736-746. <https://doi.org/10.1080/00224499.2014.960908>
- Schneider, J. P. (2004). Understanding and diagnosing sex addiction. In R. H. Coombs (Ed.), *Handbook of addictive disorders: A practical guide to diagnosis and treatment* (pp. 197-232). John Wiley & Sons.
- Shor, E. (2019). Age, aggression, and pleasure in popular online pornographic videos. *Violence Against Women*, 25(8), 1018-1036. <https://doi.org/10.1177/1077801218804101>
- Sklenarik, S., Potenza, M. N., Gola, M., Kor, A., Kraus, S. W., & Astur, R. S. (2019). Approach bias for erotic stimuli in heterosexual male college students who use pornography. *Journal of Behavioral Addictions*, 8(2), 234-241. <https://doi.org/10.1556/2006.8.2019.31>
- Stanley, N., Barter, C., Wood, M., Aghtaie, N., Larkins, C., Lanau, A., & Överlien, C. (2018). Pornography, sexual coercion and abuse and sexting in young people’s intimate relationships: A European study. *Journal of Interpersonal Violence*, 33(19), 2919-2944. <https://doi.org/10.1177/0886260516633204>
- Sun, C., Bridges, A., Johnson, J. A., & Ezzell, M. B. (2016). Pornography and the male sexual script: An analysis of consumption and sexual relations. *Archives of Sexual Behavior*, 45, 983-994. <https://doi.org/10.1007/s10508-014-0391-2>
- Svedin, C. G., Åkerman, I., & Priebe, G. (2011). Frequent users of pornography. A population based epidemiological study of Swedish male adolescents. *Journal of Adolescence*, 34(4), 779-788. <https://doi.org/10.1016/j.adolescence.2010.04.010>
- Vandenbosch, L., van Oosten, J. M. F., & Peter, J. (2018). Sexually explicit Internet material and adolescents’ sexual performance orientation: The mediating roles of enjoyment and perceived utility. *Media Psychology*, 21, 50-74. <https://doi.org/10.1080/15213269.2017.1361842>
- Vera-Gray, F., McGlynn, C., Kureshi, I., & Butterby, K. (2021). Sexual violence as a sexual script in mainstream online pornography. *The British Journal of Criminology*, 61(5), 1243-1260. <https://doi.org/10.1093/bjc/azab035>

- Voon, V., Mole, T. B., Banca, P., Porter, L., Morris, L., Mitchell, S., Lapa, T. R., Karr, J., Harrison, N. A., Potenza, M. N., & Irvine, M. (2014). Neural correlates of sexual cue reactivity in individuals with and without compulsive sexual behaviours. *PLoS ONE*, 9(7), e102419. <https://doi.org/10.1371/journal.pone.0102419>
- Waterman, E. A., Wesche, R., Morris, G., Edwards, K. M., & Banyard, V. L. (2022). Prospective associations between pornography viewing and sexual aggression among adolescents. *Journal of Research on Adolescence*. Advance online publication. <https://doi.org/10.1111/jora.12745>
- Weber, M., Quiring, O., & Daschmann, G. (2012). Peers, parents and pornography: Exploring adolescents' exposure to sexually explicit material and its developmental correlates. *Sexuality & Culture*, 16, 408-427. <https://doi.org/10.1007/s12119-012-9132-7>
- Wright, P. J. (2011). Mass media effects on youth sexual behavior: Assessing the claim for causality. *Annals of the International Communication Association*, 35(1), 343-385. <https://doi.org/10.1080/23808985.2011.11679121>
- Wright, P. J., Herbenick, D., & Tokunaga, R. S. (2021). Pornography consumption and sexual choking: An evaluation of theoretical mechanisms. *Health Communication*. Advance online publication. <https://doi.org/10.1080/10410236.2021.1991641>
- Ybarra, M. L., & Thompson, R. E. (2018). Predicting the emergence of sexual violence in adolescence. *Prevention Science*, 19, 403-415. <https://doi.org/10.1007/s11121-017-0810-4>