

Associations Between Adolescent Pornography Use and Their Sexual and Reproductive Health Literature Review

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Associations Between Adolescent Pornography Use and Their Sexual and Reproductive Health: A Literature Review

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Table of Contents

1. Background	3
1.1 Importance of Understanding the Potential Effects of Adolescent Pornography Use	5
1.2 Focus of this Literature Review	6
2. Effects of Pornography on Sexual and Reproductive Health	7
2.1 Sexual Attitudes and Beliefs	7
2.2 Sexual Self-Development	8
2.3 Sexual Behaviours	10
2.4 Sexual Harassment, Aggression, and Victimization	12
3. Limitations of this Body of Literature	14
4. Conclusions	16
References	18

1. Background

A substantial international literature exists on pornography use among adolescents¹, and its predictors and potential effects. Pornography can be defined as “professionally produced or user-generated pictures or videos (clips) intended to sexually arouse the viewer”, which typically show sexual activities with a specific focus on genitalia (Peter & Valkenburg, 2016, p. 510). Although the term “pornography” will be used throughout this review, it is important to note that authors of the literature reviewed use a number of other terms to describe such material, including “sexually explicit material”, “X-rated material”, “sexually explicit websites”, and “sexually explicit Internet material”. Koletić (2017) suggests that this variation reflects differences in the types and explicitness of media included in the studies. As discussed within Flood (2009), sexual content is increasingly represented within popular culture and mainstream media (Levy, 2005; Strasburger & Wilson, 2002), and information and communication technologies have changed the way pornography is produced and consumed (Hearn, 2006).

Although pornography exists in multiple forms (e.g., rented or purchased videos, magazines, comics, books, images, online videos or images), Internet pornography is ubiquitous and has become increasingly accessible through the use of smartphones and tablets. Indeed, Arrington-Sanders and colleagues (2015) found that approximately 80% of the pornography consumed by adolescents in their sample was Internet material. Other recent qualitative work suggests that adolescents primarily access pornographic content on the Internet, and that doing so is perceived as socially accepted and normative (Löfgren-Mårtenson & Månsson, 2009). Illustrating both the ease of access to Internet pornography and normativity of use, Rothman and Adhia (2016) found that 10% of their sample of 16-17 year olds reported watching pornography at school.

Although research suggests that pornography use is normative and acceptable among adolescents, the percentage of adolescents who use pornography varies widely between studies. For example, Peter and Valkenburg suggest in their 2016 review of the literature that internationally, 7-8% to 59% of adolescents intentionally use pornography. The authors note that the diversity of prevalence rates in this review is likely due to methodology (including how pornography is defined), the time of study (a finding that was valid in the early 2000s may be outdated now given the proliferation of Internet pornography and new technologies to access it), and the cultural context of studies. For example, less than 10% of adolescents in Shek and Ma’s 2012 sample in Hong Kong reported using pornography in the past year, in contrast to nearly half of American adolescents as reported by Hardy, Hurst, Prince, and Denton (2019). No national Canadian statistics were found regarding the prevalence of adolescent pornography use, but recent empirical work from the United States suggests that the majority of adolescents report at least some exposure to pornography. For example, Braun-Courville and Rojas (2009) reported that 86% of adolescent males and 50% of

¹ The Canadian Paediatric Society (2016) suggests that physiologically normal puberty marks the beginning of adolescence, and the acceptance of an adult identity and behaviour reflects its end. They suggest that this period of development corresponds approximately to the ages of 10 to 19 years, which is consistent with the World Health Organization’s definition of adolescence (WHO, 2016) and is the definition of adolescence used for this review.

adolescent females in their sample had ever visited a pornographic website. In a recent, nationally representative sample, 44% of boys and 17% of girls aged 13-18 reported pornography use within the last year (Hardy et al., 2019). The vast majority (83%) of Arrington-Sanders and colleagues' (2015) participants (black males aged 15-19 who have sex with other males) had used pornography, and 85% of these pornography users had accessed it in the four months between research interviews. Among those adolescents who do use pornography, research indicates that they may access it quite frequently. For example, participants in Rothman and Adhia's (2016) research reported using pornography on average twice per week.

In line with the above findings, adolescent boys are substantially more likely to report using pornography compared to girls across cultural contexts (Brown & L'Engle, 2009; Doornwaard, Bickham, Rich, ter Bogt, & van den Eijnden, 2015; Hardy, Steelman, Coyne, & Ridge, 2013; Lim, Aglus, Carrotte, Vella, & Hellard, 2017; Luder, Pittett, Berchtold, Akre, Michaud, & Suris, 2011; Peter & Valkenburg, 2016; Wolak, Mitchell, & Finkelhor, 2006). Moreover, boys are more likely to be exposed to pornography at an earlier age, see more images and more extreme content, and view pornography more frequently (Lim et al., 2017; Sabina, Wolak, & Finkelhor, 2008). Peter and Valkenburg (2008) found that 28% of male adolescents reported looking at pictures of people having sex at least once a week, compared to 3% of females. Other factors have also been fairly strongly associated with adolescents' use of pornography. Older adolescents have been found in many studies to be more likely to use pornography than younger adolescents (e.g., Brown & L'Engle, 2009; Doornwaard et al., 2015; Hardy et al., 2019; Peter & Valkenburg, 2008; Ševčíková & Daneback, 2014; Wolak et al., 2006), although Peter & Valkenburg (2016) report mixed findings based on their review of the research on age as a predictor of pornography use. In their retrospective study with college students in the United States, Sabina and colleagues (2008) found that most exposure to pornography began when adolescents were between the ages of 14 and 17, although 11% of boys and 8% of girls had been exposed (voluntarily or by accident) prior to the age of 12. Peter and Valkenburg (2016) also state that being pubertally more advanced (rather than actual age) is associated with more frequent pornography use.

Adolescents high in sensation seeking, with weak or troubled family relationships, and who are LGBTQ+ are more likely to report use/greater use of pornography (Beyens, Vandenbosch, & Eggermont, 2015; Brown & L'Engle, 2009; Lim et al., 2017; Luder et al., 2011; Peter & Valkenburg, 2011a; Peter & Valkenburg, 2016; Shek & Ma, 2012). Earlier childhood exposure to pornography has also been linked to more frequent use later in adolescence among Croatian adolescents (Cranney, Koletić, & Štulhofer, 2018), and some research indicates that adolescents become desensitized² to pornographic content with exposure and over time (Daneback, Ševčíková, & Ježek, 2018; Lo, Wei, & Wu, 2010). Internalized religiosity, religious involvement, and attendance at one's religious congregation are associated with less use of pornography (Hardy et al., 2013; Rasmussen & Bierman, 2016). Conservative parental attitudes towards sex are also associated with less use of

² In the studies cited, desensitization meant that adolescents became less bothered by pornographic content and perceived it as less harmful to themselves and others.

pornography, although this association may depend on adolescents' own attitudes (Hardy et al., 2019). Hardy and colleagues found that in their longitudinal study, conservative parental attitudes toward sex were moderately associated with conservative adolescent attitudes toward sex at first follow-up, and adolescents' conservative attitudes were a strong predictor of not reporting pornography use at the end of the study. This suggests that it is adolescents' attitudes, often internalized from their parents, which most strongly predict pornography use.

Adolescents report several main reasons for using pornography. First, curiosity and sexual exploration may drive use (Braun-Courville & Rojas, 2009; Cameron et al., 2005; Löfgren-Mårtenson & Månsson, 2009; Sabina et al., 2008). Among the Swedish adolescents in Löfgren-Mårtenson and Månsson's (2009) research, using pornography was a way to explore one's own and others' reactions to sexual behaviours, appearances (e.g., pubic grooming), and bodies. Adolescents watch and discuss pornography with peers and may also be asked by their romantic or sexual partner to watch pornography together (Ševčíková & Daneback, 2014). Among Rothman and Adhia's (2016) sample of 16-17 year old American adolescents who had seen pornography in the past year, 51% reported experiencing such a request and 61% of these adolescents were asked to do something sexual that a partner saw first in pornographic media. Secondly, particularly for boys, pornography is used for sexual arousal and masturbation (Arrington-Sanders et al., 2015; Cameron et al., 2015; Löfgren-Mårtenson & Månsson, 2009; Sabina et al., 2008; Ševčíková & Daneback, 2014). Although curiosity was the most commonly stated reason for pornography use among adolescents in the Czech Republic, boys' use of pornography for arousal increased with age (Ševčíková & Daneback, 2014).

Finally, adolescents use pornography to learn about sex. The majority (54%) of 16-17 year old American adolescents in Rothman and Adhia's research reported watching pornography in order to learn how to do something sexual. Although adolescents may not always view pornographic content as accurate, they still use it to learn sexual positions or acts, techniques, and preferences (Löfgren-Mårtenson & Månsson, 2009; Rothman, Kaczmarzsky, Burke, Jansen, & Baughman, 2015). Rothman and Adhia's (2016) sample of adolescents reported that their primary source of sex information was pornography (30%), more so than parents/guardians (21%), siblings or peers (16%), and school or teachers (11%). Pornography as a source of information about sex may be particularly important for adolescents who are LGBTQ+. For example, same-sex-attracted boys in Arrington-Sanders and colleagues' (2015) research described how pornography allowed them to anonymously learn about their sexual orientation and identity, sexual performance including sexual roles, and the mechanics of same-sex sexual activity within a context where they had little knowledge and few informational resources.

1.1 Importance of Understanding the Potential Effects of Adolescent Pornography Use

As illustrated above, pornography use is relatively common and normative among North American adolescents. Brown and L'Engle (2009) argue that adolescent exposure to sexually explicit material is not a new phenomenon, but the Internet and other new media technologies have increased its accessibility and provided space for a broader variety of sexual content (e.g.,

live WebCam sites, discussion and depiction of sexual paraphilias³). The vast majority of adolescents have access to the Internet, where pornography is easy to access when desired and often encountered without intent to seek it out. For example, Braun-Courville and Rojas (2009) reported that more than 96% of their adolescent sample had Internet access, and 46% reported accidental exposure to sexually explicit websites. This illustrates how in addition to intentional pornography use, some exposure to pornographic content is accidental and unwanted. Even in 2006 among very early adolescents (10-11 year olds), Wolak et al. found that 17% of boys and 16% of girls reported unwanted/accidental exposure to online pornography. Among adolescents at risk of delinquency, exposure may be much higher; Burton, Leibowitz, and Howard (2010) found that more than half of juvenile offenders of both sexual and non-sexual crimes reported exposure (either unwanted or wanted) to some form of pornography prior to the age of 10, and almost all reported exposure as adolescents. The prevalence and accessibility of pornographic material of various forms means that adolescents are readily exposed (wanted or unwanted) to pornography.

Because adolescents are in a unique developmental period characterized by frontal lobe development, self-exploration, and accelerated sexual development, their use of pornography has been studied through a lens of potential harms. Bryant (2010) suggests that a key concern about adolescent pornography use is that adolescents' exposure to sexual content (which may vary widely in focus, explicitness, violence, and cultural messaging) occurs prior to the developmental ability to integrate it into a healthy sexual identity. This underlies concerns that pornography use by adolescents may interfere with normal sexual development; encourage sexual practices that may not be considered appropriate according to dominant cultural discourses (e.g., acceptance of extramarital sex); negatively affect their physical, emotional, and psychological well-being; and negatively affect relationships and increase sexual violence (Bryant, 2010). Concerns also arise from the larger body of research on adult pornography consumption, which has been linked to some negative outcomes including increased acceptance of sexual violence and perpetration of male sexual aggression against women, decreased sexual intimacy, problematic relationship dynamics, and addictive behaviours (Flood, 2009). Given the prevalence and accessibility of pornography and the salience of sexual and romantic relationship development during adolescence, it is important to understand the potential effects of pornography use on adolescents.

1.2 Focus of this Literature Review

A variety of adolescent outcomes and their relationships to pornography use have been studied in the literature. Some examples include academic performance (Beyens et al., 2015), mental health (Mattebo, Tydén, Häggström-Nordin, Nilsson, & Larsson, 2018), and Internet addiction (Alexandraki, Stavropoulos, Burleigh, King, & Griffiths, 2018). The focus of the current review is on the potential effects of pornography use on adolescents' sexual and reproductive health.

³ Sexual paraphilia are characterized by intense sexual interest, fantasies, and urges regarding objects, activities, or subjects considered to be deviant or unusual by dominant societal standards. Examples may include sexual arousal to animals, pain, humiliation, or exhibitionism such as flashing (showing one's genitals to a stranger).

Given the rapid and recent changes in technology and accessibility of varied online pornographic material described above, as well as shifting social norms around sexual attitudes and behaviours, only recent literature (from the past 15 years) was reviewed. Although the original intent of this review was to understand the potential effects of pornography use for Canadian adolescents, Canadian research on adolescent pornography use was very limited. The population of focus is therefore North American adolescents, although findings from this research are briefly compared to the larger body of international literature in the area.

2. Effects of Pornography on Sexual and Reproductive Health

In the literature reviewed, adolescents' outcomes related to sexual and reproductive health fall into four main categories: 1) sexual attitudes and beliefs; 2) sexual self-development; 3) sexual behaviours; and 4) sexual harassment, aggression, and victimization. The research related to each category of outcomes is described below.

2.1 Sexual Attitudes and Beliefs

In two studies with adolescents in the United States, researchers found that the use of pornography was associated with more permissive sexual attitudes (Braun-Courville & Rojas, 2009; Brown & L'Engle, 2009). In Braun-Courville and Rojas' sample of 492 adolescents and young adults (aged 12-22 years), those who visited sexually explicit websites were more likely to endorse permissive attitudes (e.g., sex outside of a relationship, sex with many partners, casual and recreational sex). Moreover, the frequency of exposure suggests a dosage effect; as the frequency of adolescents' pornography use increased, so did their permissive attitudes toward sex. Brown and L'Engle (2009) examined patterns of pornography use (X-rated movies, magazines, and Internet material) among 12-14 year olds, and its association to those adolescents' sexual attitudes and behaviours two years later. At the time of first survey, adolescents who used pornography held more permissive sexual norms and less progressive gender role attitudes. In this study, adolescents' attitudes toward sex before marriage were part of how permissive sexual norms were understood. Longitudinal analysis showed that for males, exposure to pornography in early adolescence predicted more permissive sexual norms two years later but not less progressive gender role attitudes. The opposite relationship was found for female adolescents, whose use of pornography at age 12-14 was predictive of less progressive gender role attitudes but not more permissive sexual norms two years later.

A significant amount of the international literature has focused on the relationship between adolescents' pornography use and their sexual attitudes and beliefs. This literature, from European and Asian countries, suggests that adolescents' pornography use is related to permissive sexual attitudes: more recreational, casual, uncommitted, and instrumental (i.e., sex to fulfill orgasm rather than as part of a relationship with another person) attitudes toward sex (Doornwaard et al., 2015; Lo & Wei, 2005; Peter & Valkenburg, 2006; Peter & Valkenburg, 2008; To, Ngai, & Kan, 2012). In their review of the literature, Peter & Valkenburg (2016) state that there is consistent evidence that pornography use is related to stronger permissive sexual

attitudes. The available research also suggests that pornography use is associated with negative gender attitudes and beliefs such as the view that women are sex objects, beliefs that women lead men on sexually, or that they enjoy sexual coercion (Peter & Valkenburg, 2009a; Stanley et al., 2018; To et al., 2012). In their review, Owens, Behun, Manning, and Reid (2012) conclude that adolescents' exposure to Internet pornography is associated with the acquisition of a variety of sexual beliefs, including greater conservative or more negative gender role attitudes and more permissive attitudes towards sex. Only a couple of studies did not find an association between adolescent pornography use and beliefs that women engage in "token" resistance to sex (Peter & Valkenburg, 2011b), or between pornography use and sexual permissiveness (sexual activity as a minor, multiple sexual partners, casual or uncommitted sex) (Martyniuk & Štulhofer, 2018).

Importantly, authors have examined several factors that might explain or mediate the relationship between pornography use and sexual attitudes and beliefs. For example, in their one year longitudinal study with 13-20 year olds in the Netherlands, Peter and Valkenburg (2009a) found that the degree to which adolescents reported they liked pornography (found it "nice" and "attractive") was important to the relationship between pornography use and beliefs that women are sex objects. More frequent self-reported use of pornography at the beginning of their research increased the degree to which adolescents reported liking the pornographic material, which in turn led to stronger beliefs that women are sex objects. This suggests enjoyment and perceived attractiveness of the pornography consumed is important to whether frequent use increases adolescents' negative beliefs about women. The degree to which adolescents perceive pornography as being realistic and useful, and the degree to which they are engaged/react positively to the material, also impact the degree to which using it increases sexual permissiveness (including recreational and instrumental attitudes toward sex) and sexually coercive attitudes (Peter & Valkenburg, 2006; Peter & Valkenburg, 2010; To et al., 2012). There is also some evidence to suggest that the relationship between pornography use and permissive sexual attitudes may be stronger for boys (Doornwaard et al., 2015). Finally, some of these relationships may be bi-directional, with adolescents who hold more negative gender role attitudes and beliefs or more permissive sexual attitudes also being more likely to enjoy and use pornography more frequently (e.g., Peter & Valkenburg, 2009a). The international literature is therefore mainly consistent with the North American literature, and adds to it by considering factors that influence the relationship between adolescents' pornography use and their sexual beliefs and attitudes.

2.2 Sexual Self-Development

Several studies with American adolescents suggest that pornography use may have an effect on their understanding of and feelings about sex. Arrington-Sanders and colleagues (2015) conducted qualitative interviews with 47 Black male adolescents attracted to men, aged 15-19. These adolescents reported that pornography served as a "bridge" to sexual activity, by helping them explore their own sexual identity and learn about sex with other men. It was sometimes through pornography that these adolescents discovered or confirmed their sexual orientation,

as well as their personal readiness to engage in sex. Participants also learned about sex through pornography, describing it as a “manual for sex” with visual aids. Pornography also introduced sexual scripts illustrating sexual roles, how they should act in sexual encounters, and how sex should feel.

Rothman et al. (2015) reported similar findings based on their interviews with 23 low-income, Black and Hispanic adolescents aged 16-18. Almost all of their participants (91%) said that they learned how to have sex (sexual positions, what partners might do, how to do particular sex acts) by watching pornography. Adolescents also learned other elements of sexual scripts, like how to initiate sex and how to talk during sex. In their retrospective study, Sabina et al. (2008) found that a small minority of their 594 participants (12% of boys and 18.7% of girls) reported that viewing pornography as adolescents had a strong effect on their attitudes or emotions. Of this group, boys were more likely to report feeling sexual excitement, whereas girls reported significantly more embarrassment and disgust. Over two thirds of girls described shock or surprise as a result of the content they were viewing. Half of adolescent males and one third of adolescent females felt guilt or shame about their exposure to pornography, and a quarter of the sample had unwanted thoughts about the experience. Importantly for the development of a sexual self, 15% of adolescent males and 19% of adolescent females reported that they felt unattractive or inadequate after viewing pornography. This suggests that while some elements of exposure to pornographic sexual scripts may facilitate the development of a sexual self (e.g., learning about techniques and one’s own desires), others may not (e.g., the evocation of negative feelings about the experience of pornography use or about one’s self).

The international literature from European countries adds to the research described above. More frequent exposure to pornography is associated with greater sexual uncertainty – lack of clarity about one’s sexual beliefs and values (Peter & Valkenburg, 2008; Peter & Valkenburg, 2009c), less satisfaction with one’s sexual life (Peter & Valkenburg, 2009b), greater sexual daydreaming and compulsivity (problems caused by sexual thoughts and behaviours) (To et al., 2012), and a greater likelihood of having a sexual performance orientation (where one’s focus is on sexual performance, and sexual proficiency is valued) (Vandenbosch, van Oosten, & Peter, 2018). Again, some research suggests that there are factors that affect the relationship between pornography use and adolescents’ outcomes. Štulhofer, Buško, and Landripet (2010) found that exposure to pornography at age 14 was associated with lower sexual satisfaction only among adolescents who used paraphilic⁴ pornography; this appeared to occur because of lowered relationship intimacy. Additionally, the degree to which adolescents become involved in/react to pornography impacts how much pornography use impacts sexual compulsivity, daydreaming, and sexual uncertainty (Peter & Valkenburg, 2009c; To et al., 2012).

⁴ Paraphilic pornography was defined in this study as any of four genres of pornography: S&M (sadism and masochism) and B&D (bondage and discipline); fetishism; bestiality; and violent/coercive sexual activities.

Consistent with the North American research, Löfgren-Mårtenson and Månsson (2009) found that adolescents viewed pornography as a way to learn sexual scripts and techniques, although they also criticized elements of the sexual scripts portrayed (e.g., the lack of pleasure shown by women, the ability of men to always be sexually willing and able to perform). Female adolescents described being influenced by the physical ideals displayed in pornography (e.g., shaved pubic hair) and expressed feeling uncertain about their sexual self-esteem and ability to “live up to” the women in the pornography that boys watched. Despite this, the adolescents in Löfgren-Mårtenson and Månsson’s (2009) research felt that they were able to navigate the sexual norms portrayed in pornography and that their ability to do so increased with age. In their review of the literature, Owens et al. (2012) concluded that there is some relationship between adolescents’ use of pornography and their sexual self-concept, primarily involving self-comparison and fears of not measuring up to pornographic standards. Overall, the international literature is consistent with the conclusions from North American literature that pornography affects adolescents’ sexual selves, by enacting sexual scripts that may educate adolescents but also leave them uncertain about their sexual values, and possibly less confident in and satisfied with their own sexual lives.

2.3 Sexual Behaviours

Literature on adolescents in the United States suggests that there is an association between pornography use and engaging in sexual behaviours, and that pornography is a model for specific behaviours for some North American adolescents. In their longitudinal study, Brown and L’Engle (2009) found that for adolescents who had not yet had sex, exposure to pornography was strongly associated with engaging in oral sex two years later. For males only, exposure to pornography was associated with having had sexual intercourse two years later. Male adolescents who used all three types of pornography assessed in the study (X-rated movies, magazines, and Internet material) at the start of the study were almost three times more likely to report oral sex and sexual intercourse at follow-up. Female adolescents who used all three types of pornography were twice as likely to report oral sex and two and a half times as likely to report sexual intercourse at follow-up. This association may depend on pornography content and how adolescents react to the pornography; among participants in Sabina et al.’s (2015) research, 22% of those who reported being strongly affected by their exposure to pornography reported they were less eager to seek sexual activity.

Other research more specifically examines the potential relationship between pornography and sexual behaviours that could be considered risky. Braun-Courville and Rojas (2009) found among their sample of 492 adolescents and youth (aged 12-22) that adolescents exposed to sexually explicit web sites were more likely to have multiple sexual partners in their lifetime and in the last three months, to have used alcohol or other substances the last time they had sex, and to have had anal sex. They were also more likely to report having engaged in more than three of

the sexual risk behaviours assessed by the researchers.⁵ However, condom use at last sexual encounter, sexually transmitted infection history, using the Internet to find a sexual partner, prostitution, and early age of first sexual encounter were not significantly associated with exposure to pornography.

Two qualitative studies (Arrington-Sanders et al., 2015; Rothman et al., 2015) offer additional insight into the potential association between pornography use and sexual behaviours. Adolescents in these studies reported using pornography as a model for sex and engaging in the behaviours they saw depicted. These could be health protective, such as condom and lubricant use during anal sex, or risky behaviours such as lack of condom use (Arrington-Sanders et al., 2015). Participants in Rothman et al.'s (2015) sample of 16-18 year olds, especially females, reported that watching pornography encouraged them to engage in sexual acts that they would not have tried otherwise, such as anal sex. This had negative consequences for some of the adolescent girls, who reported that they ended up in pain from anal sex, felt forced to have sex that wasn't comfortable or that they didn't enjoy, or faked sexual response. Potentially coercive sexual behaviour and pressure from boyfriends to perform sexual acts seen in pornography were the negative relational experiences described by some adolescents as a result of pornography; otherwise, adolescents did not feel it negatively impacted their relationships (Rothman et al., 2015).

In the international literature from Europe, Asia, and Australia there is also an association between pornography use/frequency of use and sexual intercourse, specifically early sex before the age of 15, as well as an association with anal sex (specifically for women) and casual sex with a friend (Häggström-Nordin, Hanson, & Tydén, 2005; Lim et al., 2017; Lo & Wei, 2005; Luder et al., 2011; Mattebo et al., 2013). In their 2016 review, Peter and Valkenburg concluded that more frequent pornography use is related to a greater likelihood of having sex and that this association is stronger for girls. In a retrospective study with late adolescents/young adults, Štulhofer et al. (2010) also found that adolescent use of paraphilic pornography (but not "regular" pornography) was associated with having more varied sexual experiences. There is also international evidence to suggest that pornography can operate as a model for adolescents' sexual behaviour, at least for some subgroups of adolescent pornography users. Echoing the qualitative work from North America, female adolescents in Löfgren-Mårtenson and Månsson's (2009) research worried that boys would expect them to perform behaviours from pornography that they may not want to do (e.g., anal sex), although the male adolescents in this study suggested that their pornography use did not influence their sexual requests and behaviour. Mattebo et al. (2013) found that watching "hard"⁶ pornography was associated with adolescents

⁵ These included multiple sexual partners in their lifetime, more than one sexual partner in the last three months, lack of condom use at last sexual encounter, alcohol or substance use at last sexual encounter, anal sex, having a history of sexually transmitted infections, using the Internet to find a sex partner, and prostitution.

⁶ Mattebo et al. (2013) did not report how they defined "hard" pornography. However, in general (assuming some variation), "hard" pornography includes depictions of sexual intercourse or self-stimulation that are heavily focused on genitalia, which may include masturbation, multiple partners, and paraphilia (Willoughby & Busby, 2016). In contrast, depictions of nudity and depictions of sexual intercourse where genitalia are not the main focus may be considered "soft pornography".

self-reporting their behaviour is influenced by pornography and having tried sexual acts inspired by this content. Häggström-Nordin et al. (2005) found that male high consumers of pornography were more likely to engage in behaviours seen in pornography compared to low consumers or women.

There is mixed or inconsistent international evidence regarding pornography use and sexual risk behaviours, similar to the North American literature. Lim et al. (2017) found in their Australian sample that there was no relationship between the frequency of pornography use and using a condom when having sex with either a new partner, casual partner, or multiple partners in the past year. Somewhat contrary to these findings, Luder et al. (2011) reported that Swedish adolescents' pornography exposure was predictive of not using a condom for males (not females), but that pornography use was not related to early sexual intercourse (before the age of 15), multiple sexual partners, or history of pregnancy. Peter and Valkenburg (2011c) found in a longitudinal study that pornography use increased sexual risk behaviours among male adults, but not among adolescents of either sex. Researchers have however found an association between pornography use and sexting messages and images among adolescents in several European countries (Romito & Beltrami, 2015; Stanley et al., 2018; Van Ouytsel, Ponnet, & Walrave, 2014). There is, therefore, some initial support for an association (which has not been studied longitudinally) between sexting and pornography use, but mixed evidence regarding other sexual risk behaviours such as condom use.

2.4 Sexual Harassment, Aggression, and Victimization

Several studies conducted with North American adolescents examined sexual aggression and victimization as a potential effect of pornography use. Findings suggest an association between pornography exposure and perpetration of sexual harassment and aggression, but little association between pornography and specific features of sexually aggressive incidents such as severity. In their longitudinal study with 12-14 year olds in the United States, Brown and L'Engle (2009) examined the relationship between pornography use (X-rated movies, magazines, and Internet materials) and the perpetration of sexual harassment (e.g., calling a peer a sexually offensive name, touching or brushing up against a peer in a sexual way, grabbing or pulling at a peer's clothing in a sexual way, cornering a peer in a sexual way). They found that pornography use at age 12-14 was predictive of more frequent sexual harassment perpetration by male adolescents two years later. After controlling for other variables (demographics, pubertal status, and sensation seeking), the association between pornography use and sexual harassment was not significant for female adolescents. In another two-year longitudinal study in the United States, Ybarra and colleagues (2011) found that 10-15 year old adolescents exposed to non-violent pornography were not more likely to report sexually aggressive behaviour compared to those who did not use pornography. However, adolescents who used violent pornography were six times more likely to report at follow-up that they sexually assaulted someone or sexually harassed others online or via technology.

In several other studies researchers examined the relationships between pornography and the frequency and features of sexual assault among individuals who have perpetrated sexual offences or engage in inappropriate sexual behaviour, instead of a general adolescent population. Burton et al. (2010) investigated the relationship between exposure to pornography (a wide variety of types and content) and sexual crime variables including age of starting to sexually abuse, number and type (e.g., child, adult) of victims, and offence severity, in a sample of 218 incarcerated juvenile sexual offenders and 94 incarcerated non-sexual juvenile offenders (all of whom were male) in the United States. Juvenile sexual offenders reported significantly more frequent exposure to pornography before the age of 10 and as adolescents, compared to non-sexual offenders. However, frequency of exposure among sexual offenders was not related to any sexual crime variable examined in the study, although adolescent offenders who watched pornography frequently were more likely to report being aroused by males under the age of 12, masochism, and sadism. Moreover, exposure to child pornography was not related to the number of children assaulted. Exposure to forceful pornography was not related to being sexually aroused by rape, or to the use of physical force in their own offences.

In a retrospective Canadian study, Mancini, Reckdenwald, and Beauregard (2012) examined whether adult offenders' previous exposure to pornography in adolescence, adulthood, and just prior to the offence elevated the violence of their sex offence (increased physical injury and humiliation of the victim). Similar to Burton et al. (2010), they did not find a significant relationship between pornography use at any time point and the severity of physical injury during the sexual assault. They did, however, find that self-reported pornography use during adolescence but not adulthood (including just prior to the offence) was related to greater victim humiliation during the sexual assault. The authors suggest that this relationship may exist because pornography is often degrading to women and children, and adolescence is a key developmental period for social learning. Finally, Alexy, Burgess, and Prentky (2009) examined pornography use and sexually aggressive behaviour in an American sample of 160 juvenile sexually reactive adolescents (adolescents who engage in sexually inappropriate and/or coercive acts with other youth and adults, who have not necessarily been convicted of a criminal sexual offence). These children⁷ and adolescents had been removed from abusive homes, and therefore represent a vulnerable sample at high-risk for problematic and anti-social behaviours. Among this sample, those who reported use and interest in pornography (almost all boys) were more than twice as likely to make sexually aggressive comments toward others, engage in forced oral or digital penetration, and expose themselves to strangers compared to those who did not use pornography. Pornography users were also almost five times as likely to have sex with animals and engage in coerced vaginal penetration. There was no significant relationship between pornography use and forced vaginal and anal penetration, peeping, and sexually explicit orders or threats.

⁷ Thirty individuals in their sample were under the age of 10.

Similar to the North American literature, European adolescents' pornography use appears to be predictive of the perpetration of sexual harassment and sexual violence although the cited research is not longitudinal (Bonino, Ciarano, Rabaglietti, & Cattelino, 2006; Stanley et al., 2018). As suggested in the North American literature, the form and content of media may be important. Bonino et al. (2006) found that reading pornographic comics and magazines significantly increased the likelihood of having sexually harassed a peer or forced someone to have sex, whereas viewing films or videos increased the likelihood of being a victim of sexual violence. For female but not male adolescents, pornography use appears to be related to victimization: being a victim of family violence, sexual violence, and/or dating violence (Bonino et al., 2006; Romito & Beltramini, 2015). In their review of the literature, Peter and Valkenburg concluded that pornography use is related to sexual harassment, sexual aggression, and assault (primarily for boys), and to sexual victimization (specifically for girls). Thus, there is evidence overall to suggest associations between pornography use and sexual aggression, harassment, and victimization, and that the form of these associations differs between male and female adolescents.

3. Limitations of this Body of Literature

It is important to consider the research described above in relation to its limitations. Peter and Valkenburg (2016) note a number of limitations of this body of literature in their review, including non-experimental research designs, a large degree of variation between studies in how pornography use is defined and measured, little attention to how developmental variables such as age and maturation impact relationships between pornography use and outcomes, limited attention to the potential processes underlying these relationships, a bias towards the negative effects of pornography and the status quo regarding sexual norms, and homogenous samples which are primarily from Westernized countries. Several of these and additional limitations are discussed further below.

First, although this review was focused primarily on North American literature, virtually no work has been done in a Canadian context. It is therefore difficult to know the extent to which Canadian adolescents use different forms of pornography, and whether the observed relationships between pornography use and different outcomes would be the same within a Canadian context. Comparing to the international literature is helpful, since it illustrates to what extent the potential effects of adolescents' pornography use are consistent in geographic and cultural contexts beyond the United States. Still, the lack of Canadian research is a limitation of this review and body of literature.

Second, much of the research is cross-sectional rather than longitudinal, so adolescents are surveyed at one point in time rather than followed over time. Longitudinal designs allow researchers to tentatively infer causality, if pornography use at an earlier time point is related to an outcome at

a later point⁸. If there is simply an association between pornography use and another variable at the same time point, we are not able to say whether pornography use causes that variable, pornography use is caused *by* that variable, or some other factor explains the relationship between the two. An example is the research on sexting; it is quite possible that an increasing developmental interest in sex explains both pornography use and sexting behaviour rather than sexting behaviour being an outcome of pornography use. Thus, Peter and Valkenburg (2016) suggest that it is premature to interpret relationships as pornography *causing* changes in sexual attitudes, sexual development, and behaviour. Despite this caveat, some of the longitudinal work discussed above using analytic models (particularly work by Peter and Valkenburg) does imply some causal relationships between earlier pornography use and later outcomes.

A third limitation in the literature is the degree of variation between studies in how pornography is defined and used as a variable. Peter and Valkenburg (2016) highlight the variations between types of use (e.g., intentional use, unintentional exposure, any exposure), the time frame of use (e.g., past 30 days, ever), the form of media (e.g., Internet, video, magazine), and the content of pornography (e.g., “soft”, “hard”, violent, paraphilic). As there is some evidence that the form of media may be important (Bonino et al., 2006), this was specified when possible in the above descriptions of North American research. Similarly, the content of pornography was described when relevant, although few studies asked about or considered the content of pornography used. This is a limitation that is important to address via future research, since it appears to affect the relationships between adolescent pornography use and outcomes (e.g., Štulhofer et al., 2010; Ybarra et al., 2011). For example, Ybarra and colleagues (2011) found that sexual aggression was related to violent pornography but not mainstream, nonviolent pornography.

Fourth, there is a significant negative bias in the literature (Peter & Valkenburg, 2016), wherein researchers have primarily approached the topic attempting to examine potential risks and dangers of adolescent pornography use rather than whether it can be associated with positive outcomes (e.g., greater sexual knowledge and sexual efficacy), and can be used in a positive way within sexual and romantic relationships. To and colleagues (2012) did assess the relationship between pornography use and sexual knowledge, but their focus was on knowledge related to physical development, fertility, pregnancy, contraception, menstruation, and sexually transmitted infections. This is not the type of information adolescents are likely to learn through pornography use. Although existing research suggests that pornography use may negatively affect the sexual self in some ways, it is noteworthy that in qualitative research many adolescents also describe positive effects on their sexual development (acquisition of sexual knowledge and greater confidence). Thus, research that is not focused specifically on hypothesized harms to adolescents may provide a more complete picture of how pornography affects their sexual and reproductive health. Similarly, there is a bias toward the status quo in how variables are assessed and findings are presented within this body of literature (Peter & Valkenburg, 2016). For example, there is generally an underlying

⁸ To truly conclude causality, an experimental design is needed where participants are randomly assigned to groups and the variable is manipulated (e.g., one group watches pornography and one does not).

assumption that permissive sexual attitudes are problematic, and some items used to measure adolescents' permissive attitudes are outdated by contemporary standards (e.g., "people should not have sex before marriage"). Associations between casual sex and pornography use, for example, should also be considered in relation to larger sociocultural changes to sexual norms.

Finally, the literature focuses primarily on heterosexual adolescents (or more commonly, sexual orientation is not assessed or considered). This is a major oversight given that there is evidence LGBTQ+ adolescents use pornography more frequently than non-LGBTQ+ adolescents (e.g., Lim et al., 2017; Luder et al., 2011), and that pornography may play an important role in same-sex-attracted adolescents' sexual identity development and acquisition of knowledge about sexual relationships (Arrington-Sanders et al., 2015). It is therefore important to consider adolescents' sexual orientation and how it affects the relationships between pornography use and adolescents' sexual and reproductive health. While none of the research reviewed examined adolescents' gender orientation and how it related to pornography use, this would be an interesting avenue of further research given that pornographic scripts often feature specific (and sometimes very problematic) gendered sexual roles.

4. Conclusions

A small body of research exists within North America looking at the potential effects of adolescent pornography use on their sexual and reproductive health. Based on this literature, pornography use among North American adolescents appears to: affect the developing sexual self in both positive (e.g., increased knowledge) and negative (e.g., comparison and uncertainty) ways; predict more permissive and negative gender-stereotyped attitudes towards sex; increase adolescents' likelihood of engaging in sexual intercourse and some specific sexual behaviours, but not necessarily risky sexual behaviours like condom non-use; and be predictive of perpetrating sexual harassment and aggression, primarily for male adolescents. This research is almost all with American adolescents, and therefore may or may not be reflective of Canadian adolescents. However, comparison with international literature suggests that the observed relationships between pornography use and sexual and reproductive health outcomes are fairly similar in other geographic and cultural contexts (the majority of this research was conducted in Westernized European countries).

Importantly, not all of the relationships between pornography use and specific outcomes are direct relationships. Factors such as sex (whether adolescents are male or female), how much adolescents like and engage with the pornographic material, the degree to which pornography is perceived as being realistic and useful, and the content of pornography impacted many of the relationships between pornography use and sexual and reproductive health outcomes. This suggests that it is not just exposure to pornography that is related to many of the outcomes reviewed, but also how adolescents perceive and engage with this material, and relate it to their own sexual lives. These factors have primarily been studied in the international literature, and add to our understanding of how pornography use may affect adolescents; further attention to mediating/moderating factors in the North American literature is required.

It is also important to reiterate that most of the studies reviewed were not longitudinal, and the available evidence does not prove that pornography use causes these effects. However, pornography use is associated with the outcomes described above, and for some of these outcomes longitudinal evidence suggests that pornography use at an earlier time point is predictive of these outcomes at a later time point. Such work also helps show bi-directional effects, wherein “outcome” variables may also be predictive of pornography use. Further longitudinal research within a North American context is needed, in order to better assess whether and how pornography use impacts sexual and reproductive health.

Overall, the research suggests that pornography use is related to, and may impact, North American adolescents’ attitudes and beliefs, sexual self, sexual behaviour, and engagement in sexual harassment and aggression. These findings appear to be consistent with the broader international literature on adolescent pornography use. Although not definitively causal, the presence of relationships between pornography and many sexual and reproductive health outcomes suggests that more research is needed to understand the potential impacts of pornography use on adolescents. Further research should include Canadian adolescents, be longitudinal, be attentive to researcher assumptions and bias, and consider other factors which may be important to better understand the potential effects of adolescent pornography use.

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