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To cite this article: Katerina Litsou , Paul Byron , Alan McKee & Roger Ingham (2020): Learning from pornography: results of a mixed methods systematic review, Sex Education, DOI: [10.1080/14681811.2020.1786362](https://doi.org/10.1080/14681811.2020.1786362)

To link to this article: <https://doi.org/10.1080/14681811.2020.1786362>



Published online: 09 Jul 2020.



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Learning from pornography: results of a mixed methods systematic review

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ABSTRACT

Researchers and media commentators often claim that young people are increasingly learning about sex through pornography, but evidence about this is unclear. This article reports on a mixed methods systematic review of research on pornography use for sexual learning. Ten articles were included that explicitly addressed how porn users describe the educational aspects of pornography. Thematic analysis located five key themes about 'porn education' in these articles: learning the mechanics of sex; learning concerning sexual identities and sexualities; inadequate information through pornography; wrong lessons from pornography; and a need for more relevant sex education. No articles attempted to measure or discuss whether people who access pornography have better (or worse) skills and knowledge about sex and sexual health than those who do not. Sex education is only discussed in relation to young people, neglecting attention to lifelong learning about sex and sexuality. According to this dataset, pornography use can offer useful information about the mechanics of sex, and this is particularly pertinent for young gay men. Many articles reveal that young people are often aware of the shortcomings of pornography as a source of information and guidance, and that improvements to sex and relationships education are necessary.

ARTICLE HISTORY

Received 12 February 2020

Accepted 19 June 2020

KEYWORDS

Pornography; sexually explicit material; sex education; learning; interdisciplinary research

Introduction

It is claimed that pornography is a significant source of sexual education for many young people, especially when other sources of information are limited, inadequate, or unavailable (Harkness, Mullan, and Blaszczyński 2015; Rosengard et al. 2012; Albury 2014; Smith 2013; Lehmillier 2018). Access to pornography through digital media, along with the ability to use anonymous search and browse, makes it easy for people to regularly engage with sexual media (Spišák 2016; Attwood et al. 2015; Paasonen 2011). This has fuelled concern that pornography is a primary source of sex education for many young people, along with worries about what porn is (or is capable of) teaching young people (Albury 2014; Dawson, Nic Gabhainn, and MacNeela 2019b). This article presents the results from a systematic review of studies on pornography use and what people report they are learning from such use.

This research forms part of an interdisciplinary study of the relationship between the consumption of pornography and healthy sexual development, as defined by McKee et al. (2010). More information about the broader project is provided elsewhere (McKee and Ingham 2018; McKee et al. 2019, 2020).

Several systematic reviews have explored research on the consumption of pornography. Ashton, McDonald, and Kirkman (2018), for example, conducted a systematic review on women's experiences of pornography. Their results indicated that women's experiences with pornography are complex and depend on individual micro differences arising from personal desires and public expectations.

In another systematic review of pornography consumption and indicators of sexual risk behaviours, associations were reported between watching pornography, a greater level of unsafe sex practices, and a higher numbers of sexual partners (Harkness, Mullan, and Blaszczyński 2015). Elsewhere, De Alarcon et al.'s (2019) systematic review of online pornography addiction reported that addiction seems to be a subtype of hypersexual disorder, that it can be considered pathological and that it can adversely influence sexual development and sexual functioning. An additional systematic review has reported on research on young people's consumption of pornography (Alexandraki et al. 2018), finding that research has mainly focused on individual related factors, and that more research is needed on the contextual (e.g. social influences) and activity (e.g. Internet practices) aspects of porn use (Alexandraki et al. 2018). None of the above systematic reviews focuses on research regarding the extent to which consumers report pornography as a source of education.

While many researchers have acknowledged that pornography is a source of sexual education, there is little agreement as to what consumers actually learn from it (Albury 2014). School-based sex and relationships education is often criticised for being overly biological, and overly concerned with risk-avoidance rather than suggesting that sex is potentially pleasurable (Allen and Carmody 2012; Philpott, Knerr, and Boydell 2006; Ingham 2005). A similar point can be made about broader pornography research that neglects attention to pleasure through its risk focus, particularly regarding young people's use of porn (Spišák 2016).

According to the government's latest Relationships and Sex Education guidelines in England, pornography presents a distorted picture of sexual behaviours, can damage the way people see themselves in relation to others and negatively affects how they behave towards sexual partners (Department for Education UK 2019, 28). Much research literature implies that watching pornography can have negative effects on audiences, claiming that pornography can be a poor source of sexual education. For example, it has been proposed that as a result of watching pornography, people are more likely to: engage in sexual behaviours which elevate the risk of acquiring sexually transmitted infections (Braun-Courville and Rojas 2009); have less progressive gender role attitudes (Brown and L'Engle 2009); be less willing to intervene as a bystander in a possible rape situation (Foubert, Brosi, and Bannon 2011); and have increased likelihood of engaging in unprotected insertive anal sex (which entails high HIV infection risk) (Eaton et al. 2012).

There are also more general systematic reviews of pornography, with most of them focusing on supposed negative aspects of pornography use. We found no systematic reviews on pornography as a positive source of sexual learning. The very limited research on positive aspects of pornography use has focused on women and men who have sex

with men (McCormack and Wignall 2017; Smith 2007). Some exceptions that focus on broader populations include McKee (2007a), McKee, Lumby, and Albury (2008), Rissel et al. (2017) and Attwood, Smith, and Barker (2018). The present systematic review addresses a gap in pornography research by focusing on research where pornography users report what they learn from pornography.

Methods

A mixed methods interdisciplinary systematic review was conducted to explore what people say they learn from their use of pornography. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed as a general guide (PRISMA 2015). The review addressed if and how pornography is used as a source of sex education and, more specifically, on the relationship between pornography use and users’ knowledge about the biological and physical aspects of sex. It was not possible to conduct a formal meta-analysis since there is no general consensus among researchers regarding the search terms they use from one study to another (Boland, Cherry, and Dickson 2017), including a lack of agreement on what constitutes pornography or sexually explicit material (McKee et al. 2020).

Four databases were searched – ProQuest, EBSCO, Scopus and JSTOR. The search terms used were: (porn* OR ‘sexually explicit material’ OR ‘visual sexual stimuli’) AND (education OR information OR learn* OR knowledge OR ‘sexual health’). These search terms were each nominated by at least two members of the study’s Delphi Panel (McKee et al. 2020). Two of the authors [KL and PB] conducted the searches independently, each made a list of the results and then cross-checked the lists for discrepancies. After duplicates had been removed, 692 articles remained; these were screened by title and abstract independently by the same two authors. Articles were eligible for inclusion if they reported original research data that used qualitative and/or quantitative methods which addressed the consumption of pornography and the topic of sex education, were written in English and were published between January 2000 and December 2017. Articles for which decisions could not be made solely on the basis of abstracts and titles, were read in full. Finally, 10 articles were included in the review in accordance with the inclusion criteria mentioned above. The number of exclusions at each stage is presented in Table 1, and the final list of articles can be found in Table 2.

Analysis proceeded in line with the six steps identified in Braun and Clarke’s (2006) thematic analysis guidelines. Thematic analysis was chosen as it is not firmly attached to any specific theoretical background and thus seemed appropriate for an interdisciplinary enquiry such as this. Two researchers coded independently, looking for themes and making sure that their coding captured important information from the data in relation

Table 1. Articles inclusion process.

	removed	total
Initial total		983
Endnote removal of duplicates	284	699
Hand removal of duplicates	7	692
Title and abstract screened	634	58
Full article screened	48	
Final inclusion	-	10

Table 2. List of included articles.

Author and Country	Aim	Participants and Age Range in Years	Method		Definition of pornography	Main Findings
			Survey in real life	Not provided		
Aggarwal, Sharma, and Chhabra (2000) India	'To examine the knowledge of medical students about sex, the sources of learning about sex and the sexual behaviour and practices of young adults' (p. 226).	Male and female students, 17–25				'Common source of knowledge about sex were friends, pornographic films, books and magazines' (p. 226).
Arrington-Sanders et al. (2015) USA	'The role SEM plays on sexual development among Black adolescent males who engage in sex with other males and whether young men describe that SEM impacts sexual and risk-taking behaviour during first same-sex sexual relationships' (p. 598).	Black same-sex attracted men, 15–19	Mixed methods: Online survey Semi-structured qualitative interviews		'Sexually explicit material was defined as any kind of material aiming at creating or enhancing sexual feelings or thoughts in the recipient and, at the same time, containing explicit exposure and/or descriptions of the genitals and clear and explicit sexual acts such as vaginal intercourse, anal intercourse, oral sex, masturbation, bondage, etc.' (p. 600).	'SEM was used primarily for sexual development and learning about the mechanics of same-gender sex. Secondly, to determine readiness for sex, learn about sexual performance, introduce sexual scripts, and develop models about how sex should feel' (p. 597).
Castro-Vazquez and Kishi (2002) Japan	'To propose an educational intervention for sexuality education courses at a Japanese senior high school' (p. 465).	Men, 15–18	Semi-structured interviews	Not provided		'Interviews show the ways in which informants create their own sexual cultures by incorporating, discarding or frankly rejecting notions of sex, contraception and risk that are included in sex education at school, in pornography and in talking with peers' (p. 465).

(Continued)

Table 2. (Continued).

Author and Country	Aim	Participants and Age Range in Years		Method	Definition of pornography	Main Findings
		Men	Women			
Doornwaard et al. (2017) Netherlands	'To gain in-depth insight into Dutch adolescents' motives, perceptions and reflections towards internet use for finding information or advice related to romance and sexuality, searching for and viewing pornographic or erotic material and romantic and sexual communication' (p. 1038).	Men and women, 16–19		Web-based focus groups	'Pornography may comprise videos, pictures or written text. Such sexual images or texts are sometimes referred to as erotica' (p. 1040).	'Sex-related Internet use seems an increasingly normalized and common phenomenon. Participants perceived the Internet as a useful source of sexual information, stimulation, inspiration, and communication. Yet they discussed a range of negative consequences and risks related to sex-related online behaviours, particularly concerning pornography's potential to create unrealistic expectations about sex and sexual attractiveness. Participants generally believed they had the necessary skills to navigate through the online sexual landscape in a responsible way, although they believed other young people could be influenced inadvertently and adversely by sex-related online content' (p. 1038).
Hesse and Pedersen (2017) Canada	'To determine whether the frequency of SEM consumption predicts knowledge of sexual human anatomy, physiology, and typically practiced sexual behaviour. Also to investigate self-perceived effects of SEM consumption and whether participants report SEM as a positive or negative contributor to various aspects of life' (p. 754).	Men and women, 15–58		Survey online	'Any kind of material aiming at creating or enhancing sexual feelings or thoughts in the recipients and at the same time contain explicit exposure and/or descriptions of the genitals and clear and explicit sexual acts such as vaginal intercourse, anal intercourse, oral sex, masturbation, bondage, sadomasochism, rape, urine sex, animal sex etc. Participants were asked to refer to this definition throughout completion of the questionnaires and were informed that man of mixed-race was that material containing men and women posing or acting naked such as seen in Playboy/Playgirl did not contain clear and explicit sexual acts and were to be disregarded as pornography' (p. 761).	'We determined that contrary to expectations, frequency of SEM exposure did not contribute to inaccurate knowledge of sexual anatomy, physiology, and behaviour. Participants reported greater positive self-perceived effects of SEM consumption than negative effects' (p. 754).

(Continued)

Table 2. (Continued).

Author and Country	Aim	Participants and Age Range in Years	Method	Definition of pornography	Main Findings
Kubicek et al. (2010) USA	'To explore how and where YMSM receive relevant information on sexual health/behaviour' (p. 243).	Young men who have sex with men, 18–24	Mixed methods: Self-completed on-line interviews and surveys	Not provided	'Findings indicate that information related to gay men's sexuality is not readily available from family, friends, or schools. At initiation of anal intercourse, respondents generally had limited information about HIV and sexually transmitted infections (STIs). In some cases, this resulted in the perception that activities such as unprotected sex were 'low risk'. Many mentioned they first learned about anal sex during their sexual debut, describing painful and/or unpleasant experiences. Some relied on older/more experienced partners, the Internet, and pornography for information' (p. 243).
Smith (2013) USA	'To identify motivation for viewing sexually explicit material'. 'To explore the experiences of adolescents as they learned about sexuality' (p. 62).	Men and women, 18–32	Open-ended semi-structured interviews	Not provided	'Motivations for viewing SEM included curiosity about sex, curiosity about SEM, viewing with romantic partners, in groups or for individual pleasure' (p. 62). 'Positive assessments were that some content portrayed a more realistic range of people and bodies and it was a safe means of exploring and learning about sexuality' (p. 62). 'Negative assessments included encountering upsetting content and feeling that it portrayed unrealistic sexual behaviours and interactions' (p. 62).

(Continued)

Table 2. (Continued).

Author and Country	Aim	Participants and Age Range in Years	Method	Definition of pornography	Main Findings
Mattebo et al. (2014) Sweden	The aims were to gain a deeper understanding of how personnel, who work with adolescents, reason about the effect of pornography and its spread in the media, and to explore how well prepared they consider themselves to be in addressing sexual health and gender equality' (p. 196).	Men and women, 28–60	Focus group discussions	'Pornography is hard to define but one definition is sexually explicit pictures, texts or other material whose primary purpose is to cause sexual arousal' (p. 197).	'Conflicting messages about sexuality became the core category. Pornography conveyed a contradictory message compared with national public health goals, societal laws, and regulations. Young people use pornography as a source of information and stimulation. Pornography contributed to norm-creating ideals and a demanding sexuality, thus, confirming the traditional gender order. A professional approach was required when addressing sexuality and gender equality issues and requested better training tools and more cultural competence' (p. 196).
Rosengard et al. (2012) USA	To understand how families serve as sexual information sources, the messages adolescents recall from family and how family learning experiences affect sexual behaviour among at-risk adolescents' (p.83).	Men and women, 15–18	Semi-structured in-depth interviews	Not provided	'Many participants identified family as sexual health information sources. Primary messages recalled: risks of sex, protection, and relationship advice. Many adolescents portrayed learning experiences as negative, cautionary, lacking detail and not always balanced with positive messages. Participants who reported four or more sexual risks were the only group to identify pornography as a sexual health information source. Participants who reported fewer than four sexual risks were most likely to identify family sexual health information sources' (p. 83).

(Continued)

Table 2. (Continued).

Author and Country	Aim	Participants and Age Range in Years		Method	Definition of pornography	Main Findings
		Men and women,	Years			
Rothman et al. (2015) USA	'To answer the following: What types of pornography do youth report watching; where and for what purpose? Do youth feel that pornography exposure has an impact on their own sexual behaviours? How do parents react to their pornography use?' (p. 736).	Men and women, 16–18		Interviews	Not provided	'Youth primarily reported watching pornography that featured one-on-one sexual intercourse but also reported having seen extreme pornography (e.g., public humiliation, incest); youth reported watching pornography on home computers or smartphones, and that pornography was frequently watched in school; youth reported watching for entertainment, for sexual stimulation, instructional purposes, and to alleviate boredom; many copied what they saw in pornography during their own sexual encounters; pressure to make or to imitate pornography was an element of some unhealthy dating relationships; and parents were generally described as unsupportive of youth's use of pornography but underequipped to discuss it' (p. 736).

to the research question: namely, what is the relationship between pornography use and users' knowledge about the biological and physical aspects of sex. These results were then shared with the wider research team and, after discussion, five major themes were identified.

Notably, the terms pornography or sexually explicit material (SEM) were not defined consistently across the reviewed articles, reflecting the absence of an agreed definition of pornography (Harkness, Mullan, and Blaszczyński 2015; McKee et al. 2020). Rather than applying a strict definition of pornography, we use the terms used in the literature discussed. In our closing discussion, we follow a definition commonly suggested and used by pornography researchers (Hald and Malamuth 2008, 616), whereby pornography (or SEM) is seen as any kind of material intended to create or enhance sexual feelings or thoughts in the recipient and at the same time containing explicit exposure and/or descriptions of genitals and sexual acts. Throughout this paper the terms pornography and sexually explicit material are used interchangeably.

The terms 'sexuality education', 'sexual education' and 'sex education' are used throughout the literature reviewed, and are used interchangeably throughout this paper signifying any type of sexual education, broadly defined, provided in schools and other systems such as homes. The term 'learning' mentioned as any type of sexual learning throughout the paper, refers to any kind of learning in relation to any type of sexual activity and sexuality in general. The terms sex education and sexual learning can be considered umbrella terms, incorporating many different aspects of learning, for example learning about how one's body responds to different erotic presentations. This paper discusses only those issues that came up specifically from the included papers and not all aspects of sexual learning.

Results

Our systematic review resulted in ten articles that met the search requirements. In these articles, five main themes were identified regarding consumption of pornography and how it functioned as a source of sex education. These themes were derived from studies that predominately related to young people and school-based sex education. Eight out of the ten articles focused specifically on young people, even though the search terms did not specify a particular age group. The following five themes are not mutually exclusive, they overlap and interact and are listed from most to least common across this literature.

Learning the mechanics of sex

The most prevalent theme concerned young people's use of pornography as a source of information to learn 'how to have sex'. The articles frequently mentioned that inadequate sexual education and lack of sexual information about the mechanics of sex led people to engage with pornography. Pornography was mentioned by participants within these studies as being used for learning about sexual performance, positions and roles. For example, Arrington-Sanders et al. (2015, 602) mentioned that:

'Sexual performance was a key theme that emerged among participants as a reason why they watched SEM. Sexual performance included learning about position and sexual roles in certain positions; how adolescents should act during sexual activity with sexual partners; and how sex should feel (experiences of pain and pleasure)'.

It was often stated that it was from pornography that young people first learned 'what goes where' (Arrington-Sanders et al. 2015), 'what to do' (Rosengard et al. 2012) and 'how it works' (Kubicek et al. 2010). This includes information about the function of sexual organs, 'how to masturbate and ejaculate' (Arrington-Sanders et al. 2015), and sexual roles. In their study of US teenagers from alternative high schools and correctional facilities, Rosengard et al. (2012, 88) cite a 17-year old Hispanic woman:

'[Before watching porn] I didn't know that sex was like a penis going into a vagina. I thought it was just like when you hump somebody. Like I used to sit on people's laps and think that I was havin' sex'.

A 17-year old man of mixed-race was quoted:

'At first I was just humpin' and stuff but and then seein' that you stick it in the hole so it went on from that. I don't know, I thought I was good at it ... I just copied what I seen and since ... like ... like at that time, I thought like anybody who was on TV or tape must be great so I thought I was great and good at it' (Rosengard et al. 2012, 90).

In another of the articles, participants who realised that their knowledge was lacking from personal experience chose to privately address their 'ignorance' by consulting pornography:

'Participants described risking considerable social embarrassment if they were to ask others about sexual behaviours because their peer group stigmatised anyone who seemed to be ignorant about sex. Thus, online SEM offered participants the opportunity to learn more about these topics without risking embarrassment or loss of status' (Smith 2013, 69).

Some articles reported that, upon realising that pornography can provide information about sex that is not found in formal sex education, young people continued to engage with pornography as an information source about sex and how it should feel (Aggarwal, Sharma, and Chhabra 2000). Arrington-Sanders et al. (2015) stated:

'youth described sexual development as a process that occurs over time and not all at once where participants described learning about sexual performance through a series of experiences and experiments to determine what felt enjoyable' (603).

Rothman et al. (2015) studied pornography use among 16 to 18-year-olds in the USA and reported that pornography was used to learn sex techniques, including how to perform oral, anal and vaginal sex. A 17-year-old woman in this study explained:

'I never knew how to like, suck dick, basically, and I went on there to see how to do it. And that's how I learned' (Rothman et al. 2015, 740).

A lack of useful sex education at school was commonly noted, particularly in studies of men who have sex with men. In Kubicek et al.'s (2010) study of young men who have sex with men, for example, one participant stated:

'Because there's really no information on [anal sex] ... there's really no strong definition nor strong advice about anal sex. It's usually just through word of mouth or from porn' (p. 251).

Finally, learning how to determine readiness for sex through watching pornography was also mentioned, as well as pornography's value in helping to relax and feel prepared for sex. For example, Arrington-Sanders et al. (2015, 602) reported:

'Youth described watching SEM to determine their readiness to have sex. Participants described if they felt aroused by the sex and that they understood how to perform the sex, they were more likely to be ready to engage in sexual activity. SEM served as a bridge to begin sexual activity by calming nerves about sex and helping them to mentally prepare for initiation of sexual activity'.

Learning about sexual identities and sexualities

This theme covers how young people learn about sexual identities and sexualities from watching pornography. This includes their own and other people's sexualities and what they find to be sexually arousing. Studies of same sex attracted young men reported that pornography use assisted in realising one's sexual orientation. For example, Arrington-Sanders et al. (2015) report an 18-year-old gay man as saying:

'I started straight porn but I noticed that I didn't like it because it had a female in it for real and I didn't like it. It was just something that I would just look at the guy. I watch it but I just look at the guy do the stuff' (p. 602).

In the same study, a 19-year-old gay man is reported as saying:

'Porn taught me a lot. I first started out with straight porn. Porn actually helped me realize that I was gay. When I was watching porn, it started from just boys and girls but I started looking at the guy more. So then I got interested in two guys and a girl and then it just went to two guys and then to more guys and that's when I noticed, "Wow, I don't like girls anymore"' (Arrington-Sanders et al. 2015, 602).

Kubicek et al. (2010) report that some participants' first exposure to gay culture was through watching pornography. One young participant reported that:

'I started going to gay porn sites and I was like "That's hot". So then that's kind of how I got exposure to, I guess, gayness' (p. 252).

Inadequate information through pornography

The third theme was that pornography does not provide adequate sexual health information. Many of the articles reported that participants did not see pornography as useful for learning about sexual health, and some participants reported that pornography often seemed to focus too much on 'fetish' and 'kinky' behaviours (e.g. fisting, water sports, and bestiality) (Kubicek et al. 2010, 252). One participant from Kubicek et al.'s (2010) study is quoted saying that he:

'only learned dirty stuff because they really do dirty things, not healthy. And I'm like ... I would learn nothing positive from those movies' (p. 252).

Some articles mentioned that information about protection from sexually transmissible infections (STIs) and unwanted pregnancies was not present on account of condoms not

being used. In this way, pornographic videos were not regarded as being useful for sexual health knowledge. Castro-Vazquez and Kishi (2002) cite a 16-year-old heterosexual man:

‘... If you ask if I learnt about contraception, I would say, no ... but anyway, I would say that all those videos show us about sex, but not about ‘etiquette’, reproduction, contraception and stuff like that. We see videos to satisfy our sexual desires’ (475).

Wrong lessons from pornography

The fourth theme identified was concern, both amongst researchers and young people, that consumers might get the ‘wrong’ lessons from porn. Pornography was described as providing unrealistic expectations about sexual encounters. Young people who used pornography were concerned that other consumers (but not themselves) might get the wrong lessons from pornography via a third person effect (Hald and Malamuth 2008; Ven-Hwei and Ran 2002), such as by encountering ‘unrealistic’ messages about sex, bodies, pleasure, and ‘risky’ sex acts. Lack of emotion, exaggerated looks and performance, long duration of sex and the submissive role of women in pornography were described as unrealistic and misleading (Doornwaard et al. 2017; Smith 2013). Doornwaard et al. (2017) report a 17-year-old man participant as saying:

‘Porn is often loveless, women are frequently treated disrespectfully, and the actors do things that aren’t comfortable or arousing in real-life’ (p. 1043).

While some participants regarded this kind of pornography as being arousing, they questioned the unrealistic aspects of what they have watched, exemplified by a 16 year old man (Doornwaard et al. 2017):

‘When I am aroused, pornography is fun to watch. But afterwards I regularly ask myself what I just looked at. Not that I view very absurd stuff, but it often is very unrealistic’ (p. 1044).

Young women, in particular, reported concerns relating to their self-image, the unlikely scenarios and the unrealistic expectations placed on them through watching pornography (Smith 2013). Young women who did not watch pornography also stated that they felt insecure about their appearance and their sexual performance (Doornwaard et al. 2017). For example, a 20-year-old said:

‘So I’d almost be like pissed if that is how it turned out just because the woman is doing everything that the guy wants to do, and I’m definitely not like that at all’ (Smith 2013, 71-72).

A need for more relevant sex education

The final theme is a call for improved sex education, better addressing the needs of young people. This theme differs from themes regarding the learning that takes place from watching pornography, but it is included due to the importance of considering broader aspects and systems of sexual learning. Researchers call for a broadening of the scope of sexual education:

‘to lean away from only teaching about pregnancy prevention and male erections’ (Hesse and Pedersen 2017, 768),

'the need to improve knowledge about different aspects of sex' (Aggarwal, Sharma, and Chhabra 2000, 226)

and

'that schools need to develop strategies on how to teach students basic and effective search methods on obtaining information pertaining to sexual health on the Internet. This would ensure that students receive comprehensive sexual health information from credible websites' (Mattebo et al. 2014, 197).

In addition, it was suggested that specific education for same-sex attracted young men is required, along with the need for teachers to be well trained and comfortable in discussing sexual diversity (Kubicek et al. 2010):

'More policy level strategies are needed that insure federal funding is allocated to comprehensive sexual health education programs that provide [same-sex attracted] young men with the skills and information needed to make an informed, responsible, and healthy decisions prior to first same-sex' (Arrington-Sanders et al. 2015, 606).

Discussion

A key finding from our analysis, looking across these five themes, is that none of the articles attempted to measure or discuss whether people who consume pornography have better knowledge, improved skills and/or different attitudes about sexual health and sex than people who do not.

Two of our themes – inadequate information through pornography and wrong lessons from pornography – indicate that pornography provides limited or inaccurate information about sex and sexual health. At the same time, there is research that shows that watching sexually explicit media is just one of many factors influencing young people's sexual behaviour (Hald, Kuyper, Adam, and de Wit 2013).

Further, there is no clear evidence showing that people who do not get adequate sexual education actually choose to watch pornography by way of compensation. There is only limited cross-sectional research on this topic. An Irish university student sample, aged 18–24 years, showed that satisfaction with school-based sex education was not associated with pornography use as a source of sexual information and that individuals may use pornography for information regardless of the sex education they received at school (Dawson, Nic Gabhainn, and MacNeela 2019a).

One article in our sample claimed that pornography was the only available source for men who have sex with men to learn about anal sex, since information about this is not provided through school-based sex education (Kubicek et al. 2010). However, this same paper does not provide evidence on specific ways of using pornography, nor on whether pornography users have better sexual knowledge, sexual skills and attitudes in comparison to non-users. More generally, there is evidence from across a range of research that people use porn to enhance their sex lives, as a form of play, recreation, as well as other reasons (Attwood 2005; Tsaliki 2011; Ashton, McDonald, and Kirkman 2018; Albury 2014; Rissel et al. 2017; McKee 2007b).

According to this dataset, pornography use can offer information about many aspects relating to the mechanics of sex – what goes where and what bodies can do in a range of

sexual situations, as well as learning about one's sexual identity, sexual desire, sexual pleasure, all of which are important kinds of sexual learning that many schools continue to fail to address. Authors claim that it is important that there is at least one source of information that can provide accurate sexual health education and encourage open communication regarding these issues for those who need it (Gesser-Edelsburg and Elhadi Arabia 2018; Lehmiller 2018).

A key issue raised in a number of the articles reviewed is that young people seem aware of the shortcomings of pornography as a source of information and guidance. The potential harm created when young people use pornography as a form of sex education can potentially be mitigated by engaging more directly with young people regarding their pornography use

Limitations

This systematic review only included articles published in the English language between January 2000 and December 2017, excluding books, book chapters and unpublished material. Due to rapid change in the availability of sexually explicit material accessible via smart phones (Spišák 2016), some important information will inevitably be missing from the selected articles.

Conclusions

People – especially young people – learn about sex from pornography. The authors of most of the articles examined here highlight the need to adopt a more holistic perspective on sexual health promotion as opposed to one primarily concerned with a risk-reduction. In particular, it is recommended that information should be provided regarding the use of pornography in order to get sexual pleasure, how to avoid viewing sexually explicit material when people do not want to view it, as well as information to encourage more critical evaluation of the sexual information and sexual acts depicted in sexually explicit materials (Smith 2013). In addition, more research is needed to identify whether people who watch sexually explicit material do have better knowledge of the mechanics (and other aspects) of sex than those who do not; as well as whether they have a more (or less) comprehensive understanding of common sexual roles and sexual identities.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Australian Research Council [DP 170100808].

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