



Problematic and Non-Problematic Pornography Use Among LGBTQ Adolescents: a Systematic Literature Review

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Abstract

Purpose of Review Pornography use is highly prevalent among adolescents, yet lesbian, gay, bisexual, transgender, and queer (LGBTQ) adolescents remain an understudied population and knowledge about their pornography use is limited. Therefore, we aimed to provide an overview of LGBTQ adolescents' pornography use patterns and compare them with those of heterosexual adolescents.

Recent Findings Despite the fact that there is limited data to draw conclusions, pornography may be viewed at a younger age for LGBTQ girls, be more prevalent, and be more frequent among LGBTQ adolescents than among their heterosexual counterparts. Despite this higher use pattern, LGBTQ adolescents may not be more prone to developing problematic pornography use based on their reported primary motivations for use. LGBTQ adolescents may not only use pornography to experience sexual pleasure, but they can also use it to learn about sexuality and develop their sexual identity. However, LGBTQ adolescents' pornography use does not appear to be related to more negative outcomes compared with heterosexual adolescents; thus, LGBTQ adolescents do not seem more vulnerable to pornographic materials than heterosexual adolescents.

Summary Although problematic or compulsive pornography use may seem an obvious explanation, LGBTQ adolescents' more frequent pornography use may derive from their unmet needs regarding information on LGBTQ sexual activities and may be considered a part of their sexual identity development process.

Keywords Bisexual · Compulsive sexual behavior · Homosexual · Hypersexuality · LGBT · Pornography

Introduction

With widespread Internet access and the advent of digital technologies, pornography has become readily accessible [1, 2]. The ease of access to pornography has made its use not only common among adults [3–5] but also highly prevalent among adolescents as well [6•, 7, 8•]. This is unsurprising, as teens dominate the online population, with relatively common

exposure to any online content [9]. In 2005, among 1500 American Internet users aged 10 to 17 years, 42% reported past-year exposure to online pornography [10]. Exposure to pornography may appear both intentionally (i.e., deliberate search for pornographic materials) and/or unwantedly (e.g., pornographic materials show up in pop-up advertisements) with unwanted pornography exposure being more prevalent among adolescents than wanted exposure [10, 11]. According to recent nationally representative studies from the USA and Switzerland, 66 to 71% of adolescents reported unwanted exposure to pornography, whereas 29 to 34% reported intentional pornography use [10, 11]. Furthermore, according to recent results from a study examining objective website traffic data [12], online pornography use increased by 10% among children and pre-adolescents (aged 7 to 12 years old) between 2004 and 2016.

These high rates and their continuous rise yielded a proliferation of research examining adolescents' pornography use in the past two decades [6•, 7, 8•]. Several studies examined whether pornography use can affect adolescents' sexual

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attitudes, beliefs, and behaviors [6•, 7, 8•, 13], while only a handful of them examined the background or other potential outcomes of adolescents' pornography use [6•, 8•]. Some reviews described that adolescents' pornography use is only related to higher levels of sexual aggression [7], while other reviews suggested that both sexual attitudes (e.g., having more permissive sexual attitudes) and behaviors (e.g., more frequent causal sexual intercourses) can be negatively affected by pornography use [6•, 8•, 13], even resulting in problematic/compulsive pornography use in the long run [7].

However, relatively little scientific attention has been paid to LGBTQ (lesbian, gay, bisexual, transgender, and queer) adolescents' pornography use [8•], despite the higher frequency of pornography use reported among LGBTQ adults [14, 15]. Adolescents tend to engage more frequently in solitary sexual activities (e.g., pornography use and/or masturbation) than in partnered sexual activities [16]. This pattern may be more strongly expressed among LGBTQ adolescents, as they may experience more difficulties finding romantic or sexual partners. Indeed, LGBTQ adolescents usually have a smaller pool of potential partners relative to their heterosexual peers and they may not feel comfortable revealing their sexual orientation and/or gender identity because of the potential negative consequences, such as peer bullying in school [17, 18]. Thus, it has been shown that they use the Internet more to find partners or information on LGBTQ sexual activities, or to simply explore their sexual identity, attraction, and preferences, relative to heterosexual adolescents [19–22]. Higher Internet use paired with these motivations may render pornography particularly easy to access and attractive for LGBTQ adolescents. Higher use of pornography paired with social stigma still associated with being a sexual or gender minority may, in some cases, pave the way to a problematic or compulsive use. However, even if some studies included LGBTQ adolescents or were specifically interested in this population, knowledge about their pornography use, and whether it is problematic or not, remains fragmentary, limiting the conclusions that can be drawn. Despite the increasing number of reviews focusing on adolescents' pornography use [6•, 7, 8•, 13], none of these studies focused on or made a distinction for LGBTQ adolescents.

Therefore, the present literature review focused on problematic and non-problematic pornography use among LGBTQ adolescents. Although an emphasis was placed on studies that were published in peer-reviewed journals in the past 5 years, prior studies were also included in the present systematic literature review given their importance (e.g., using nationally representative samples). The aims of this literature review were (a) to provide an overview of the current knowledge on LGBTQ adolescents' pornography use and (b) to highlight significant knowledge gaps that should be addressed in future studies. When possible, heterosexual and LGBTQ adolescents' pornography use will be compared.

Search Strategy, Eligibility Criteria, and Study Selection

Following previous search protocols from systematic literature reviews including adolescents and LGBTQ individuals (for example [6•, 23]), we searched both PsycINFO and Web of Science with the search term ((homosexual* OR gay OR “sexual minority” OR “sexual minorities” OR lesbian* OR bisexual* OR queer OR “sexual orientation” OR “men who have sex with men” OR MSM OR “women who have sex with women” OR WSW) AND (porn* OR “sexually explicit”) AND (adolescent* OR teen* OR youth)) to identify studies examining pornography use among LGBTQ adolescents. We searched for articles that were published in peer-reviewed journals in the past 5 years (deadline: July 23, 2019). Our search resulted in 91 articles in PsycINFO and 51 articles in Web of Science (see Fig. 1). We excluded those articles that (a) were not published in English (PsycINFO: five articles, Web of Science: no article), (b) did not present empirical data (PsycINFO: six articles, Web of Science: seven articles), (c) did not include adolescent samples (we only included articles that examined samples of adolescents aged between 10 and 17 years, and/or with a mean age between 10 and 18 years [6•]) (PsycINFO: 51 articles, Web of Science: 26 articles), (d) did not assess or report the sexual orientation of the participants (or did not use it in any analysis) (PsycINFO: 18 articles, Web of Science: 9 articles), and (e) did not assess or report any pornography use-related behaviors (e.g., frequency of pornography use, reasons for pornography use) (PsycINFO: four articles, Web of Science: four articles). Overall, eight studies met the requirements to be included in this literature review. However, when reading the remaining articles, we further excluded those articles that focused on different topics (e.g., image-based sexual abuse or sexting) (PsycINFO: three articles, Web of Science: one article) resulting in four studies [24–27]. Also, from the overviewed articles and recent literature reviews on adolescents' pornography use [6•, 7, 8•], we identified four more studies [28••, 29•, 30•, 31••] that had not appeared in our search. We added these studies to the review, and we also included three studies [11, 32, 33] that were published before 2014 given their importance (e.g., using nationally representative samples). Thus, in the present literature review, eleven studies that examined pornography use among LGBTQ adolescents or investigated samples of adolescents including LGBTQ individuals will be discussed. The details of the included studies are presented in Table 1.

Methodological Characteristics of the Reviewed Studies

Out of the eleven studies, two focused exclusively on LGBTQ adolescents [24, 28••], while the other nine examined general

Table 1 Summary of empirical studies examining pornography use among LGBTQ adolescents

Author(s) (year published)	Sample characteristic:	Methods	Operationalization of gender identity/sexual orientation	Operationalization of pornography use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Arrington-Sanders et al. [24]	<ul style="list-style-type: none"> - Black biologically male US adolescents - $N = 47$ (0% female) - $M_{age} = 17.7$ years ($SD_{age} = 1.2$ years; age range, 15–19 years) 	<ul style="list-style-type: none"> - Audio-recorded computer assisted self-interview survey (10 min) on demographics, relationships, sexual history, and risk - In-depth face-to-face, semi-structured qualitative interview on first romantic relationships and sexual experiences with other males (90–120 min) - Three follow-up interviews (every 4 months) 	<ul style="list-style-type: none"> - Reporting having had any prior (anal or oral) sex with male partners (66% gay or homosexual, 32% bisexual, 2% straight or heterosexual) 	<ul style="list-style-type: none"> - Source of use around the first same-sex experience - Repeat pornography use at 4-month follow-up interview - Frequency of use at 4-month follow-up interview - Type of pornography used 	<ul style="list-style-type: none"> - Ranges between 6 and 17 years 	<ul style="list-style-type: none"> - 81% used pornography around the first same-sex experience 	<ul style="list-style-type: none"> - Frequency of pornography use at 4-month follow-up interview: 20.7% used it 1–5 times; 20.7% 6–10 times; 0% 11–20 times; 17.2% 21–30 times; and 41.4% more than 30 times 	<ul style="list-style-type: none"> - Information seeking: learning about sex organs and same-gender sex - Visual aid for masturbation - Development and/or confirmation of sexual orientation - Determining readiness to have sex
Ballester-Arnal et al. [25]	<ul style="list-style-type: none"> - Spanish and Mexican adolescents - $N_{total} = 614$ (Mexican = 289 (59% female); Spanish = 325 (64% female)) - $M_{age} = 16.9$ years ($SD_{age} = 0.9$ years; age range, 15–18 years) 	<ul style="list-style-type: none"> - A self-reported online questionnaire on demographics and online sexual activities 	<ul style="list-style-type: none"> - Spanish sample: 70% heterosexual, 19.8% bisexual, and 10.1% homosexual - Mexican sample: 80.2% heterosexual, 16.3% bisexual, and 3.5% homosexual 	<ul style="list-style-type: none"> - Spanish version of the Internet Sex Screening Test [34] 	<ul style="list-style-type: none"> - 100% used the Internet for sexual purposes (including pornography use) - Spanish sample: 62.3% of males and 79.8% of females were recreational users; 37.7% of males and 19.3% of females were risk users; and 0% of males and 0.9% of 	<ul style="list-style-type: none"> - 100% used the Internet for sexual purposes (including pornography use) - Spanish sample: 62.3% of males and 79.8% of females were recreational users; 37.7% of males and 19.3% of females were risk users; and 0% of males and 0.9% of 	<ul style="list-style-type: none"> - 100% used the Internet for sexual purposes (including pornography use) - Spanish sample: 62.3% of males and 79.8% of females were recreational users; 37.7% of males and 19.3% of females were risk users; and 0% of males and 0.9% of 	<ul style="list-style-type: none"> - 100% used the Internet for sexual purposes (including pornography use) - Spanish sample: 62.3% of males and 79.8% of females were recreational users; 37.7% of males and 19.3% of females were risk users; and 0% of males and 0.9% of

Table 1 (continued)

Author(s) (year published)	Sample characteristic: - Study population - Sample size - Gender ratio - Average age (age range)	Methods	Operationalization of gender identity/sexual orientation	Operationalization of pornography use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Bradford et al. (2019)	- Queer and trans US adolescents - $N = 14$ (57% female ^a) - $M_{age} = 16.1$ years ($SD_{age} = 1.3$ years)	- A self-reported online questionnaire on demographics and sex education - In-person group interview about sexual health (90 min)	- Participants used their own labels (7% asexual, 7% bisexual, 7% gay or lesbian, 21% pansexual, 7% straight, 14% unsure/questioning, 14% queer and pansexual, 14% pansexual and unsure/questioning, and 7% gay or lesbian, and unsure/questioning).	- 21% of the participants described using pornography as an informational source	- 21% of the participants described using pornography as an informational source	females were pathological users - Mexican sample: 80.9% of males and 93.8% of females were recreational users; 18.3% of males and 5.6% of females were risk users; and 0.9% of males and 0.6% of females were pathological users	- Information seeking, learning about sexual activities - Development of sexual identity	
Lim et al. [29•]	- Convenient sample of Australian adolescents - $N = 941$ (73% female) - Median _{age} = 20 years for women and 21 years for men ($SD_{age} = -$; age range, 15–29 years)	- Cross-sectional online survey on sexual health and behaviors	- 77% heterosexual, 23% LGBTQ	- Age at first pornography use - Pornography use frequency in the past 12 months - Source of use (solitary, with partner, with friends)	- 37% 13 years or younger, 63% 14 years or older - LGBTQ girls were more likely to use from a younger	- 87% ever viewed pornography ^b	- Frequency of pornography use in the past 12 months: 12% none, 26% less than monthly, 20 monthly, 27 weekly, 15% daily ^b - LGBTQ adolescents were three times more likely to use pornography more frequently than	

Table 1 (continued)

Author(s) (year published)	Sample characteristic:	Methods	Operationalization of gender identity/sexual orientation	Operationalization of use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Luder et al. [11]	<ul style="list-style-type: none"> - Nationally representative sample of Swiss adolescents who used the Internet in the past 30 days - $N = 6054$ (46% female) - $M_{age} = 17.9$ years (age range, 16–20 years) 	<ul style="list-style-type: none"> - Cross-sectional paper and pencil survey on health behaviors and health care use 	<ul style="list-style-type: none"> - Males: 95% heterosexual, 5% bisexual or homosexual - Females: 94.6% heterosexual, 5.4% bisexual or homosexual 	<ul style="list-style-type: none"> - Wanted, unwanted, or no exposure to online pornography in the past 30 days 	<ul style="list-style-type: none"> - Males: 75.9% used pornography in the past 30 days^b - Females: 35.9% used pornography in the past 30 days^b - Both wanted and unwanted exposure to pornography were higher among bisexual and homosexual males. - No significant differences between heterosexual and bisexual and homosexual females regarding exposure to pornography 	<ul style="list-style-type: none"> - Males: 75.9% used pornography in the past 30 days^b - Females: 35.9% used pornography in the past 30 days^b - Both wanted and unwanted exposure to pornography were higher among bisexual and homosexual males. - No significant differences between heterosexual and bisexual and homosexual females regarding exposure to pornography 	<ul style="list-style-type: none"> - 70% used pornography a few times a year or more seldom, 19% used it a few times a month, and 11% used it at least weekly^b. 	<ul style="list-style-type: none"> - Males: 75.9% used pornography in the past 30 days^b - Females: 35.9% used pornography in the past 30 days^b - Both wanted and unwanted exposure to pornography were higher among bisexual and homosexual males. - No significant differences between heterosexual and bisexual and homosexual females regarding exposure to pornography
Mattebo et al. [30]	<ul style="list-style-type: none"> - Random sample of Swedish first-year high school girls - $N = 393$ (100% female) - $M_{age} = 16.6$ years (age range, 15–20 years) 	<ul style="list-style-type: none"> - Cross-sectional paper and pencil survey 	<ul style="list-style-type: none"> - 90% heterosexual, 10% bisexual or homosexual 	<ul style="list-style-type: none"> - Ever used pornography - Age at first pornography use - Pornography use frequency - Context of use - Fantasizing about and/or performing sexual acts seen in pornography 	<ul style="list-style-type: none"> - M_{age} for active search for pornography = 13.9 years (range, 7–18 years) - 9% were bisexual among consumers, while 1% were bisexual among non-consumers. - 3% were homosexual among consumers, and no one was homosexual among non-consumers. 	<ul style="list-style-type: none"> - 54% have ever used pornography and 30% used pornography at the time of data collection^b. - 9% were bisexual among consumers, while 1% were bisexual among non-consumers. - 3% were homosexual among consumers, and no one was homosexual among non-consumers. 	<ul style="list-style-type: none"> - 70% used pornography a few times a year or more seldom, 19% used it a few times a month, and 11% used it at least weekly^b. 	<ul style="list-style-type: none"> - 70% used pornography a few times a year or more seldom, 19% used it a few times a month, and 11% used it at least weekly^b.

Table 1 (continued)

Author(s) (year published)	Sample characteristic:	Methods	Operationalization of gender identity/sexual orientation	Operationalization of pornography use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Peter and Valkenburg [32] ^c	- Study population - Sample size (gender ratio) - Average age (age range)	- Two-wave online panel questionnaire study on sexual issues - $N = 1445$ (49% female) - $M_{age} = 14.5$ years ($SD_{age} = 1.68$ years; age range, 12–17 years)	- 95% exclusively heterosexual, 5% were not exclusively heterosexual [35]	- Types of pornography used - Pornography use frequency in the past 6 months	- 30.1% used pornography intentionally in the past 6 months ^b .			
Peter and Valkenburg [33] ^c	- A random sample of Dutch adolescents from a nationally representative panel - $N = 1445$ (49% female) - $M_{age} = 14.5$ years ($SD_{age} = 1.68$ years; age range, 12–17 years)	- Two-wave online panel questionnaire study on sexual issues	- 95% exclusively heterosexual, 5% were not exclusively heterosexual [35]	- Pornography use frequency in the past 6 months				

Table 1 (continued)

Author(s) (year published)	Sample characteristic: - Study population - Sample size - Gender ratio - Average age (age range)	Methods	Operationalization of gender identity/sexual orientation	Operationalization of pornography use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Vandenbosch and Peter [31••] ^d	- A random sample of Dutch adolescents who had not watched pornography before the first wave of data collection from a nationally representative panel - $N = 400$ (63% female) - $M_{age} = 14.6$ years ($SD_{age} = 1.37$ years; age range, 13–17 years)	- Three-wave online panel questionnaire study with an interval of 6 months on sexual issues	- 95% exclusively heterosexual, 5% were not exclusively heterosexual [35]	- Pornography use frequency in the past 6 months		- 18% of the adolescents who had not used pornography before one year later ^b - Sexual orientation was not a significant predictor of starting to use pornography.	- 12% watched less than once in a month, 4% watched 1–3 times a month, and 6% watched once per week or more ^b . - 80% did not watch videos with sex in the past 6 months, 10% watched less than once in a month, 4% watched 1–3 times a month, 6% watched once per week or moreb. - LGBTQ adolescents use pornography more frequently than heterosexual adolescents.	

Table 1 (continued)

Author(s) (year published)	Sample characteristic: - Study population - Sample size - Gender ratio - Average age (age range)	Methods	Operationalization of gender identity/sexual orientation	Operationalization of pornography use	Age at first pornography use	Prevalence of pornography use	Frequency of pornography use	Reasons for pornography use
Vandenbosch et al. [26••] ^d	- A random sample of Dutch adolescents from a pool that is similar to the Dutch population - $N = 1022$ (46% female) - $M_{\text{age}} = 15.1$ years ($SD_{\text{age}} = 1.38$ years)	- Three-wave online panel questionnaire study with an interval of 6 months on sexual issues	- 94% exclusively heterosexual, 6% were not exclusively heterosexual [35]	- Pornography use frequency in the past 6 months - Enjoyment of pornography use - Perceived utility of pornography use			- Adolescent watched pornography less than once a month on average in each wave of data collection ^b . - Sexual orientation was not associated with pornography use frequency in any data collection wave.	- Neither enjoyment nor utility of pornography use was associated with sexual orientation in any data collection wave.
Vandenbosch and van Oosten [27••] ^d	- A random sample of Dutch adolescents from a pool that is representative to the Dutch population - $N = 1467$ (50% female) - $M_{\text{age}} = 14.9$ years ($SD_{\text{age}} = 1.40$ years; age range, 13–17)	- Three-wave online panel questionnaire study with an interval of 6 months on sexual issues	- 94% exclusively heterosexual, 6% were not exclusively heterosexual [35]	- Pornography use frequency in the past 6 months - Enjoyment of pornography use - Perceived utility of pornography use		- 46% used pornography at wave 1, 48% at wave 2, and 51% at wave 3 ^b	- Adolescent watched pornography less than once a month on average in each wave of data collection ^b . - Sexual orientation was not associated with pornography use frequency in any data collection wave.	- Only utility of pornography use was positively associated with sexual orientation in wave 1 data collection, indicating that LGBTQ adolescents used pornography more frequently than heterosexual individuals to gain information and learn from it.

N, sample size; *M*, mean; *SD*, standard deviation; *LGBTQ*, lesbian, gay, bisexual, transgender, and queer individuals

^a Participants could use their own gender identity labels; this ratio is based on the gender assigned at birth

^b The percentages refer to the total sample (including both heterosexual and LGBTQ adolescents)

^c These studies used the same dataset

^d These studies used the same dataset

number of studies found remained limited and their design presented important shortcomings, it can be concluded that the reviewed studies employed diverse methodological approaches and assessed various aspects of pornography. Although this diversity may provide a broader overview on LGBTQ adolescents' pornography use, it makes it more difficult to draw conclusions from these studies.

Age at First Use, Prevalence, and Frequency of LGBTQ Adolescents' Pornography Use

First experiences with pornography may have an impact on adolescents' development [6•, 7, 8•]. This influence can be more emphasized in the case of LGBTQ adolescents because LGBTQ sexuality-related topics are rarely covered in sexual education programs. LGBTQ adolescents may often rely exclusively on what they could find on the Internet to obtain sexual information [24, 35, 36]. Among the reviewed studies, only two (one exclusively among LGBTQ boys) reported LGBTQ participants' age when they first viewed pornographic materials. In a sample of 47 Black adolescent boys who reported prior sex with male partners, *first experiences with pornography* varied between 6 and 17 years [24]. This age range is too large to draw any significant conclusion, but it is similar to the results of previous studies on general adolescent populations reporting their first exposure to pornography between the ages of 6 and 19 years [37, 38] with a mean age of 11 years for boys and 12 years for girls [39]. Among a sample of 941 Australian adolescents including 23% of LGBTQ individuals, LGBTQ girls, but not boys, were more likely to watch pornography from a younger age compared with non-LGBTQ adolescents [29•]. These findings indicate that LGBTQ girls may be more prone to start using pornography at an earlier age compared with heterosexual girls to discover their sexual interests or find information on LGBTQ sexual activities. Both heterosexual and LGBTQ boys start to look for information on sexual activities at such young ages that LGBTQ boys may not have opportunities at a significantly younger age to start to use pornography (i.e., before the age of 11 [39]).

Due to methodological issues, technological changes, and cultural differences, *prevalence rates of adolescents' pornography use* vary widely from one study to another, with lifetime prevalence ranging from 25 to 98% [6•]. Determining pornography use among LGBTQ youth is even more complicated because studies on adolescents' pornography use often did not report participants' sexual orientation and/or gender identity, or even when they did, they did not calculate prevalence rates for each sexual/gender minority group separately. Eight studies [11, 24, 27••, 28••, 29•, 30•, 31••, 32] provided information on pornography use prevalence among LGBTQ adolescents. In a nationally representative sample of Swiss

adolescents, unwanted exposure to pornography was almost five times higher among LGBTQ boys than among heterosexual boys, while wanted exposure (i.e., intentional pornography use) was six times higher among them [11].

In a sample of 47 US Black adolescent boys, approximately 81% of LGBTQ boys used pornography around their first same-sex sexual experience [24] and, in another qualitative study, 21% of LGBTQ boys (out of 63) reported using pornography as an information source [28••]. Mixed results were reported regarding adolescent girls. In a study examining a convenience sample of 393 Swedish first-year high school girls [30], significantly more LGBTQ girls used pornography than heterosexual girls (3 to 9% of the pornography user group were LGBTQ, whereas only 0 to 1% of the nonuser group were LGBTQ). However, in another study examining a nationally representative sample of 6054 Swiss adolescents [11], no significant differences were identified between heterosexual and LGBTQ girls regarding their pornography use (2.21% of nonuser girls reported being bisexual or homosexual, while 3.15% of pornography user girls reported being bisexual or homosexual). The differences between the results of these studies may be attributed to the characteristics of the examined samples (e.g., Swiss versus Swedish adolescents; nationally representative versus random sample) and might derive from the different levels of sexual liberalism (Sweden has one of the highest levels of sexual liberalism in Europe [40]). In sum, no accurate prevalence rates of pornography use among LGBTQ adolescents can be determined based on current scientific data. However, it may be assumed that higher rates of lifetime prevalence of pornography use can be observed among LGBTQ adolescents than among heterosexual adolescents (especially among LGBTQ boys) [11, 30•] presumably due to the information seeking and the sexual identity-related roles of pornography use [24, 27••, 28••].

Concerning the *frequency of pornography use*, six studies [24, 26••, 27••, 29•, 30•, 33] provided information about LGBTQ adolescents' pornography use frequency. These studies reported contradictory results. Some studies among nationally representative samples of Dutch adolescents reported that adolescents viewed pornography less than once a month on average in the past 6 months, with no significant differences between LGBTQ and heterosexual adolescents [26••, 27••]. However, other studies using a nationally representative sample of Dutch adolescents [33] and a convenience sample of Australian adolescents [29•] reported that pornography use among LGBTQ adolescents was up to three times more frequent than among heterosexual adolescents. The mode (most often reported value) of pornography viewing was weekly use considering the past 12 months in the total Australian sample [29•], while it was less than once a month considering the past 6 months in the total Dutch sample [33]. These mixed findings, even within nationally representative samples of Dutch adolescents, may be explained by the different cohorts

examined: the study [33] reporting significant differences was conducted in 2008, whereas the studies with nonsignificant differences took place between 2013 and 2014 [26••, 27••]. In sum, it may be assumed that LGBTQ adolescents use pornography more frequently than heterosexual adolescents (i.e., more than once a month), but this difference may not be as accentuated as reported in the Australian study using a convenience sample [29•].

To conclude, based on current data in the literature, age at first use, the prevalence, and frequency of pornography use among LGBTQ adolescent cannot be reliably determined. LGBTQ girls may start to use pornography at a younger age [29•] than heterosexual girls and pornography use may be more prevalent and more frequent among LGBTQ adolescents than among heterosexual adolescents [11, 30•]. The reported results corroborate previous work reporting more frequent pornography use and higher levels of hypersexuality among LGBTQ men than among heterosexual men [14, 41], and more frequent pornography use and higher levels of hypersexuality among LGBTQ women than among heterosexual women [14, 15, 42]. Thus, findings in both LGBTQ adolescent and adult samples indicate that not only gender- or sexual orientation-based differences should be examined regarding pornography use, but also the interaction of gender and sexual orientation should be considered in future studies as well [14, 43, 44].

Motivations Underlying LGBTQ Adolescents' Pornography Use

As pornography use among LGBTQ adolescents appears more common and frequent, the question arises as to why they may view pornography more frequently than heterosexual adolescents. This issue can be approached from different perspectives, but arguably, the most relevant one is the perspective of motivations for pornography use. Findings of four studies regarding the potential roles and reasons of pornography use among LGBTQ adolescents will be discussed here [24, 26••, 27••, 28••]. Three main themes were identified and examined as potential reasons of pornography use: (1) development of sexual identity; (2) information seeking and learning; and (3) sexual pleasure. Information seeking and learning and sexual pleasure motivations were also explored in the case of general adolescent populations [37, 45], while sexual identity development may be specific to LGBTQ populations as it was described as a primary function of pornography use (besides information seeking) based on qualitative interviews with LGBTQ adolescents [24, 28••].

Concerning the *development of sexual identity*, two qualitative studies (range from 14 to 47 LGBTQ adolescents) [24, 28••] emphasized the potential role of pornography use to recognize or confirm sexual/gender identity and/or sexual

orientation. LGBTQ adolescents may realize during pornography use that they are attracted to same-sex (or both to same- and mixed-sex) individuals, leading to the discovery of their sexual attraction [24]. Also, LGBTQ adolescents may not feel aroused by heterosexual pornography, and this experience may contribute to further clarify their sexual preferences [24]. Besides the discovery or clarification of sexual orientation, pornography use may also serve as a tool for LGBTQ adolescents to determine whether they are ready to engage in LGBTQ sexual activities [24]. After learning about LGBTQ sexual activities, LGBTQ adolescents may use pornography to eliminate or reduce their stress regarding the initiation of LGBTQ sexual activities. In sum, pornography use may play an important role in the development and validation of LGBTQ adolescents' sexual orientation/gender identity, in contrast to heterosexual adolescents, among whom this motivation was not explored in prior studies [37, 45]. These findings are in line with those of previous studies among adults, suggesting that self-exploration (i.e., using pornography to identify one's sexual needs and preferences) may be an important factor underlying pornography use [46] and it might be fruitful to assess it in relation to different pornography use characteristics (e.g., frequency of use), especially among LGBTQ individuals.

Concerning *information seeking*, four studies—two qualitative studies among LGBTQ adolescents [24, 28••] and two nationally representative quantitative studies among general adolescent populations including LGBTQ adolescents [26••, 27••]—reported that LGBTQ adolescents use pornography to search for information regarding LGBTQ sexual activities. Based on the results of in-depth qualitative interviews [24, 28••], pornographic materials are among the first search results when looking for sexual information on the Internet. As these studies' findings suggest, LGBTQ adolescents may use these images and videos to learn about sexual roles, responsibilities, and positions; actions during sexual activities; or potential feelings during different sexual activities (e.g., whether it is normal to experience pain during given sexual activities). Moreover, LGBTQ adolescents could learn about sexuality-related health protective behaviors (e.g., condom use) from pornography, if these behaviors were presented in the viewed videos, which is rarely the case for condoms [24, 47].

In the qualitative studies conducted among LGBTQ adolescents [24, 28••], participants often reported that pornography was the only source of information about LGBTQ sexual activities and they referred to pornography as a “manual” to sex, indicating that these materials may serve as sexual scripts in off-line sexual activities. If these pornographic videos contained realistic information on sexual activities (e.g., using condom during sexual activities, sexual consent, mutual sexual pleasure), pornographic videos could provide important information. Despite using pornography as a primary information source of LGBTQ sexual activities, LGBTQ

adolescents claimed that they would have used other sources if they had (easily) found any other relevant information on the Internet [28••]. These qualitative studies' findings were further corroborated in a large, nationally representative longitudinal study conducted in the Netherlands [26••]: using pornography to find information and learn about sexual activities was significantly and positively associated with LGBTQ sexual orientation, but only during the first wave of data collection when adolescents were 15 years old on average. LGBTQ adolescents may start to use pornography to seek information on LGBTQ sexual activities, but eventually they learn enough about these activities and use pornography for other reasons, such as a visual aid to masturbation or to achieve sexual pleasure [24].

Although experiencing *sexual pleasure* is the most prevalently reported motivation for pornography use among adults [46, 48] and is among the most frequently reported one in general adolescent populations [37, 45], this reason was not, however, described as a primary motivation in qualitative, in-depth interviews with LGBTQ adolescents [24]. Only two studies [24, 26••] examined pornography use in light of sexual pleasure and enjoyment among LGBTQ adolescents. In a qualitative study among 47 Black LGBTQ boys [24], achieving sexual pleasure by masturbation was one of the reasons of *repeated* pornography use. These results suggest that frequent pornography use may serve similar reasons for LGBTQ adolescents as for heterosexual adolescents or adults and may become part of their sexual life after the emergence of their gender identity/sexual orientation. These results were corroborated in a nationally representative longitudinal study [26••] as well, in which sexual orientation was not significantly related to the enjoyment of pornography use, suggesting that both LGBTQ and heterosexual adolescents use pornography to a similar extent to experience sexual pleasure or to evoke positive feelings.

In sum, LGBTQ adolescents not only use pornography as a visual aid to masturbation or to experience sexual pleasure but pornography can also play important roles in their sexual identity development and as a primary information source for learning about sexuality. Based on previous studies among adult populations [46, 48, 49], sexual pleasure (i.e., using pornography to increase sexual arousal or as a visual aid to masturbation), sexual curiosity (i.e., seeking information about sexual activities and learning about sexuality), and self-exploration (i.e., identification of one's sexual needs and preferences) motivations had weak, if significant, associations with problematic pornography use or compulsive sexual behaviors. These findings may suggest that although LGBTQ adolescents can use pornography more intensively than heterosexual adolescents in some cases [29•, 33], they may not do so as a result of compulsive or problematic pornography use. Instead, they can use pornography because they do not receive enough information on LGBTQ sexual activities in

formal sexual education or from their parents [24, 28••]. To conclude, even if more LGBTQ adolescents use pornography and that they do so more frequently, they may not be more prone to develop problematic pornography use based on their reported primary motivations for pornography use, but other potential negative outcomes or consequences of their pornography use should be considered.

Potential Outcomes of LGBTQ Adolescents' Pornography Use

Even if more frequent pornography use may not be associated with problematic pornography use among LGBTQ adolescents, it has to be noted that *problematic pornography use* or *compulsive pornography use* may be present in the case of some LGBTQ adolescents [16, 50, 51]. According to recent studies [16, 51, 52], between 5 and 14% of adolescents may have a disposition toward problematic pornography use or showed symptoms of compulsive pornography use, although sexual orientation and/or gender identity was not considered in these studies.

Only one study [25•], using convenience samples of 2227 Mexican and Spanish adolescents, examined the potential role of sexual orientation in excessive and problematic/compulsive engagement in online sexual activities (including pornography use) comparing three user profiles (i.e., recreational use: no expected negative consequences; at-risk use: excessive cybersex use; and pathological use: compulsive, out-of-control cybersex use). According to the results, being LGBTQ increased the possibility of being an at-risk user of online sexual activities (i.e., excessive cybersex use) by 1.5 times. However, it was not examined whether being LGBTQ increased the risk of being in the pathological user profile (i.e., compulsive, out-of-control cybersex use) or not. It should be noted that this study examined a wide range of online sexual activities with true or false items (e.g., buying sexual products online, finding romantic partners online) and pornography use was only a part of it. Hence, these findings suggest that excessive cybersex use (including pornography use) may be more prevalent among LGBTQ adolescents, but it was not reported whether problematic/compulsive cybersex (including pornography use) was more prevalent among LGBTQ adolescents or not. Moreover, to the best of the authors' knowledge, emotional avoidance and stress reduction motivations for pornography use have not been examined among LGBTQ adolescents, but they may be more prevalent among them due to homophobic stigmatization, bullying, or discrimination [14, 17, 18]. These motivations could contribute to the development of problematic/compulsive pornography use in the long run [46].

Problematic/compulsive pornography use may affect only a smaller group of LGBTQ adolescents, but there are some other risks of pornography use that may be considered:

unprotected sexual behaviors. As we discussed previously, LGBTQ adolescents' primary goal with pornography use is to learn about LGBTQ sexual activities and they use pornographic videos as "scripts" for sexual acts [24]. If unsafe sexual behaviors (e.g., condomless anal sex, inconsistent condom use, or more casual sexual partners) are depicted in pornographic materials, adolescents may be more at risk of engaging in unprotected sexual behaviors. This may be more accentuated among LGBTQ adolescents because they tend to model the actors' behaviors and they do not have any other source of information from which they could learn about safe sexual behaviors [24, 28••]. However, in a longitudinal study examining the effects of pornography use on sexual risk behaviors [32], pornography use was not associated with adolescents' sexual risk behaviors over time and sexual orientation did not have an effect on this association. Thus, LGBTQ adolescents may not be more at risk trying out unsafe sexual behaviors viewed in pornography. Nevertheless, further studies are needed to better understand the complex associations between pornography use and unprotected sexual behaviors (e.g., gender-specific associations between different sexual risk behaviors and pornography use [53], or the potential effects of first time exposure on the associations of pornography use and sexuality-related outcomes [39]).

Limitations in Current Knowledge and Suggestions for Future Research

Although research on adolescents' pornography use has been proliferating in the past two decades [6•, 7, 8•, 13], little scientific attention has been paid to pornography use among LGBTQ adolescents, leading to several shortcomings and knowledge gaps in this research area. Out of the eleven studies reviewed here, only two studies focused exclusively on LGBTQ adolescents [24, 28••], and both of these used qualitative methods. Moreover, when LGBTQ adolescents were included in studies examining general adolescent populations, often no or insufficient information was provided to compare heterosexual and LGBTQ adolescents' pornography use [29•, 30•, 33]. There is a lack of robust, large-scale, quantitative studies focusing on LGBTQ adolescents' pornography use in comparison to heterosexual adolescents' use (e.g., no study has directly compared pornography use motivations between heterosexual and LGBTQ adolescents).

Furthermore, the ethnic diversity in the reviewed studies was narrow, limiting and potentially biasing the generalizability of the results. Most of the studies utilized samples from high-income European countries (one from Spain [25•], one from Switzerland [11], one from Sweden [30•], and five from the Netherlands [26••, 27••, 31••, 32, 33]), whereas only two samples were collected in the USA [24, 28••], one in Mexico [25•], and one in Australia [29•]. Unfortunately, no studies

were conducted in low-income countries. Based on the minority stress model [54], LGBTQ adolescents may experience stress as a result of being members of sexual minority groups and being stigmatized for it. However, this stress may be more pronounced in the case of those adolescents who are not only stigmatized because of their sexual orientation or gender identity but also because of their ethnicity, race, or culture as well. This "double" stigmatization may result in higher levels of stress and more negative feeling, which in turn, may lead to more frequent or even problematic pornography use as a way of coping with these negative experiences [49]. Therefore, well-powered studies should be conducted on ethnically and culturally diverse samples of adolescents to examine this hypothesized double stigmatization in relation to problematic and non-problematic pornography use in the framework of the minority stress model [54].

Additionally, studies among LGBTQ adolescents mainly focused on boys or did not compare LGBTQ boys and girls [24, 28••]. However, prior results indicate that LGBTQ men and women report some important differences in their sexual behaviors and some of the reviewed studies also indicated that LGBTQ boys and girls differed in their pornography use [14, 29•, 43, 44]. Examining only LGBTQ boys and drawing conclusions from their behaviors regarding all LGBTQ populations may lead to inappropriate overgeneralizations. In sum, conclusions that can be drawn at this point are considerably limited by the number and methods of the studies published to date. Therefore, it would be beneficial to examine not only LGBTQ boys' but also LGBTQ girls' and other genders' pornography use and sexual behaviors in large-scale, quantitative studies. When LGBTQ individuals' pornography use and/or other sexual behaviors are examined, the interaction of gender and sexual orientation should always be taken into account not only in the case of adults [14] but also in the case of adolescents as well [29•].

The frequency of pornography use is the most prominently assessed characteristic [55] and similar trends may be identified in the case of LGBTQ adolescents' pornography use as well [11, 24, 29•, 31••, 32, 33]. Although pornography use frequency can provide important information on the intensity of use, far-reaching conclusions cannot be drawn from these data without considering other pornography use characteristics. For example, pornography use frequency cannot be used in itself to determine whether a given individual's pornography use should be considered problematic or not [56] or whether it could lead to negative consequences or not [57, 58]. Although weak-to-moderate positive associations were identified between pornography use frequency and problematic pornography use in a recent longitudinal study among adolescent boys, religiosity played an important role in this association [51]. In the reviewed studies, only one study [25•] assessed problematic/compulsive cybersex use (including pornography use) among both heterosexual and LGBTQ

adolescents. Although these preliminary results suggested that more excessive pornography use may be present among LGBTQ adolescents (no information was reported about compulsive use), systematic investigations are needed in which not only the frequency of pornography use but also its severity (i.e., problematic or non-problematic use) are simultaneously assessed to examine when and under which circumstances pornography use may become problematic and may lead to negative consequences.

Moreover, assessing the frequency of pornography use without considering the reasons of or the motivations for pornography use may also lead to false conclusions. If LGBTQ adolescents use pornography often, it may indicate that they have problems with their pornography use. However, when the motivational basis of their pornography use is simultaneously considered with their frequency of use, it may become clear that an intense use of pornography is part of sexual orientation or gender identity development [24, 28••]. Therefore, future studies should not only assess the frequency of pornography use but also aim to identify the underlying motivations using longitudinal designs, which may be useful to characterize the developmental trajectories of pornography use among LGBTQ adolescents. These studies would not only contribute to the better understanding of pornography use in LGBTQ adolescents' sexual orientation development, but it may also draw attention to the potential overpathologizing of pornography use when problematic pornography use is determined based only on a cross-sectional assessment of pornography use frequency, without considering other important characteristics of use. Different methodological approaches including qualitative studies or person-centered analysis may also provide valuable, in-depth knowledge regarding the underlying psychological processes (e.g., motivations, unmet needs, different forms of romantic attachment) that may differentiate between problematic and non-problematic pornography use among LGBTQ adolescents [59–62].

Conclusions

Conclusions that can be drawn from prior studies at this point are considerably limited, but some important findings regarding LGBTQ adolescents' pornography use should be noted. Previous studies suggest that, compared with their heterosexual peers, more LGBTQ adolescents have already used pornography and they may do it more frequently than heterosexual adolescents [29•, 33]. Although problematic or compulsive pornography use [25•, 50, 51] may explain this phenomenon, the literature suggest that LGBTQ adolescents' more frequent pornography use rather derives from their unmet needs regarding information on LGBTQ sexual activities (i.e., school-based sexual education programs do not provide any or sufficient information on this topic) and may be

considered as a part of their sexual and/or gender identity development process [24, 27••, 28••]. Thus, LGBTQ adolescents' pornography use should not be systematically considered as problematic or compulsive without any other indicators of problematic sexual behaviors.

As a first step, although preliminary results are available about adolescents' problematic/compulsive pornography use [16, 51, 63], further studies are needed to test (1) whether scales developed in adult populations can be reliably used in adolescents and (2) whether scales developed in general adolescent populations may be applied in samples of LGBTQ adolescents. Then, large-scale longitudinal studies with sufficient subsamples of LGBTQ adolescents should be conducted to examine both heterosexual and LGBTQ adolescents' problematic and non-problematic pornography use. Empirical work examining pornography use among adolescents is more and more common [51, 53, 64], but LGBTQ adolescents are still underrepresented or completely missing in these studies. Also, large-scale, longitudinal studies—ideally incorporating different cultures—would be essential to examine the background and potential outcomes of LGBTQ adolescents' pornography use considering the possible gender differences among LGBTQ teens to fill current knowledge gaps. From an applied perspective, LGBTQ adolescents do not receive sufficient information on LGBTQ sexual activities in school-based sexual education programs (and they may not feel comfortable to ask about it at home), and when they try to find relevant information on the Internet, pornographic materials are among the first search results [24, 28••, 65]. Thus, easily accessible, anonym online sexual education programs for LGBTQ adolescents are crucial to provide reliable information on LGBTQ relationships and sexual activities [24, 28••, 36].

Compliance with Ethics Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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