



Pornography Consumption in People of Different Age Groups: an Analysis Based on Gender, Contents, and Consequences

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Abstract

Introduction Pornography consumption has increased exponentially in recent decades. Most studies conducted so far are focused on adult samples (typically, between 18 and 30 years old), limiting the generalizability of their results. This study aims to create a taxonomy that groups various pornographic contents and thus explore different aspects of its use (e.g., preference for different pornographic content, excessive and problematic use) in people at different life stages.

Methods Between 2016 and 2019, 8,040 individuals (71.3% men) between 12 and 85 years old ($M = 33.25$, $SD = 14.31$) completed a battery that explores pathological and non-pathological pornography use. Participants were distributed into five age groups (< 18 years old, between 18–25, 26–40, 41–60, and > 60) to perform the different analyses (ANOVA and chi-square tests for the differences between the groups, EFA for the analyses of categories of pornographic content, and hierarchical linear regressions to identify the factors related to problematic use).

Results Pornography use was highly prevalent (> 85%) in all age groups. Using a data-driven approach, we found that the pornographic content explored in this research can be classified within four categories. Using this taxonomy, we found differences according to the age for most of the pornographic content explored (e.g., sexual intercourse with opposite-sex partners [71.6–84.5% in males and 70.2–89.5% in females]). Finally, we found that age conditions the way in which preference for different pornographic content increases the risk of excessive and problematic use.

Conclusions Pornography consumption is frequent in different age groups, although it varies depending on age and content. In addition, some particular pornographic contents were identified that increase the risk of developing an addiction in different developmental stages.

Policy Implications This study provides a preliminary foundation for identifying the unique characteristics of pornography use in different age groups as well as content related to increased problematic use.

Keywords Pornography · Prevalence · Contents · Problematic use · Age groups

Introduction

With the advent of the Internet, pornography consumption has changed dramatically, both in the amount and types of sexual content available through multiple devices (e.g.,

laptop, smartphone). As a result, the number of pornography users and the level of engagement of these users have increased exponentially (Potenza, 2018). Current studies estimate that the prevalence of pornography use is relatively high, especially in men (around 60–98%) compared

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to women (around 30–90%) (Ballester-Arnal et al., 2021; Grubbs et al., 2017; Rissel et al., 2016; Solano et al., 2020).

Age seems to be an important variable when it comes to modulating different aspects of pornography use. However, its influence has been largely overlooked. Longitudinal studies like Price's et al. (2016) found that pornography use has been increasing across successive birth generations, especially in more recent generations, where consumption has increased by 16 percentage points in men and 8 percentage points in women in the 1970s and 2000s. These authors also found that pornography use decreased in each cohort as they grow older. Apart from the effect of the cohort, cross-sectional studies show that consumption is also prevalent in older people (sometimes as prevalent as in younger people) (Ševčíková et al., 2020; Træen et al., 2018), even becoming a practice carried out by 92% of men over 60 years old (Ballester-Arnal et al., 2021).

Pornographic Content

Some of the concerns related to pornography use have to do with the negative impact that certain content, especially violent content, can have on different aspects of sexuality (e.g., development of scripts with negative, sexist sexual attitudes, etc.) (Hald et al., 2010; Rostad et al., 2019). In fact, although the consumption of violent pornography is relatively uncommon (Baer et al., 2015; Ybarra et al., 2011), some studies such as the one carried out by Wright et al. (2016) show a strong association between consumption of violent pornography and aggressive sexual behaviors, especially those involving verbal aggression. This connection results in a greater concern about the negative consequences that may be associated with the consumption of pornography; nonetheless, little is known about people's preferences for pornographic contents different from violence and dominance.

One of the first challenges that arise when analyzing the type of pornography consumed is creating a taxonomy that classifies the overwhelming variety of pornographic content into specific typologies based on the content that is represented. So far, different efforts have been done to generate this taxonomy. Initial theoretically-driven classifications divided pornography into five mutually exclusive categories: i.e., sexually violent material, nonviolent sexually degrading material, nonviolent/non-degrading material, material depicting nudity without sexual behavior, and material involving minors (Gunter, 2001). Similarly, Leonhardt et al. (2019) proposed a classification of pornography into categories according to the degree of sexual explicitness (sexually suggestive media vs sexually explicit media) and the kind of sexual content (paraphilic content). Despite their face validity, these classifications have not yet been confirmed by empirical studies, so their use for research purposes is discouraged. From a data-driven approach (exploratory or

confirmatory factor analyses), two recent studies proposed the classification of pornographic content into two and three categories, respectively: sexually provocative media (non-explicit) vs pornography (explicit sex) (Leonhardt & Willoughby, 2019) and group sex, non-heterosexual sex, or non-mainstream (paraphilic) contents (Hald & Štulhofer, 2016). Although these studies follow a more rigorous approach, they have some limitations, such as not including a category for non-normophilic pornographic content in the first proposal, or the inclusion of complementary categories according to sex and sexual orientation (see Kohut et al., 2019).

Given the current lack of a sound classification of pornographic contents, the first aim of this study was to generate a data-driven taxonomy of pornographic contents based on data from a large sample of pornography users, including older men and women (a population typically overlooked in previous studies). Based on the taxonomy of pornographic contents generated during the previous step, our second aim was to analyze and compare the use of different pornographic materials in different age groups. One of the few studies addressing this aspect was carried out by Hald (2006) in a sample of 688 men and women aged between 18 and 30 years old. In this study, both men and women were found to prefer to watch X-rated contents depicting vaginal intercourse (74.6% in men and 79% in women); however, women showed a preference for “softcore” pornography (nonexplicit sex), while men preferred pornography with a higher degree of sexual explicitness. Ten years later, Hald and Štulhofer (2016) revisited pornographic preferences of 27 different types in a research conducted with 2,337 men and women between the ages of 18 and 40. The results show that “vanilla” sex (oral/vaginal sex, masturbation, etc.) and group sex (threesome, orgy, gang bang) were the most used content, while X-rated content showing paraphilic sexual interests (e.g., violent sex and fetish) were unusual. This finding resonates with that reported by Tripodi et al. (2015) in a sample of university students, where a notable proportion reported having seen scenes of bondage (45%), exhibitionism (37%), fetishism (34%) or pedophilia (17%). These studies focus on adolescents and adults, and do not compare the use of different pornographic content in different life stages, despite the existence of studies that suggest that sexual preferences (both normophilic and paraphilic) change throughout life (Laws et al., 2008).

Pornographic Contents and Cybersex Addiction

Excessive and problematic pornography use (aka, pornography addiction), one of the most concerning consequences of pornography use (Wéry & Billieux, 2017), has often been encompassed under the umbrella term of “cybersex addiction.” Although some definitions of cybersex are more conservative and only include activities in interaction with other

people in their definition (Ross et al., 2004), the broader ones also include solo sexual activities (e.g., use of pornography) (Döring, 2009) due in part to the fact that pornography use is the most common online sexual activity (OSA) (Ballester-Arnal et al., 2021; Döring et al., 2017). Cybersex addiction is defined as a “maladaptive pattern of online sexual behavior, leading to clinically significant impairment or distress” (Dhuffar & Griffiths, 2015; p. 8). Whereas the diagnostic framework for this clinical condition remains controversial, some proposals identify the following symptoms from cybersex addiction: (a) excessive time/effort spent on OSA; (b) impaired self-control; (c) failure to fulfill family, social, or work responsibilities; and (d) persistence in the sexual behavior despite its consequences (Efrati, 2020; Wéry & Billieux, 2017). Some colleagues have estimated that the prevalence of this clinical condition ranges from 0.8 to 8% of cybersex users (including porn users) who have signs and symptoms of this clinical condition (Ballester-Arnal et al., 2016; Bóthe et al., 2020a; Rissel et al., 2016; Ross et al., 2012). Some studies suggest that consumption of specific pornographic contents (mainly, paraphilics) may be more strongly associated to the risk of developing cybersex addiction. This may be due to tolerance symptoms that can manifest in two ways: (a) with the increase in the frequency or time invested in sexual activity and (b) with the search for increasingly stimulating sexual material, whose variability usually refers to the consumption of paraphilic, violent, illegal pornographic content, etc. (Lewczuk et al., 2021; Orzack & Ross, 2000). Despite these evidences, studies in this regard are still scarce, especially when we talk about specific populations such as the elderly or adolescents. In this sense, studies such as Bártová’s et al. (2020) found in a large sample of Czechs between 18 and 88 years that 12 types of paraphilic interests correlated with the frequency of pornography use; however, it does not specify the effect that age may have. Similarly, Baer et al. (2015) found that the use of certain pornographic content (e.g., violent pornography) correlated with the frequency of pornography viewing in general ($r=0.21$). Although the frequency of online sexual activities (OSA) may not be considered a diagnostic criterion for addiction to cybersex in the absence of other criteria (Bóthe et al., 2020a; Gola et al., 2016), a high frequency is an a priori condition for the diagnosis of this clinical picture. For example, there are people who consume pornography relatively frequently but who maintain control over sexual activity or who do not experience discomfort or interference (Kor et al., 2014). However, in many of the existing diagnostic proposals for sex or cybersex addiction, it is one of the essential diagnostic criteria (e.g., Carnes, 2001). This is probably due to its relationship with the negative consequences experienced, as well as its participation in addiction circuits (e.g., as responses to the craving produced by this behavior, which is strongly linked to compulsive behavior) (Brand et al., 2016; Chen et al., 2018). For this reason, any

aspect that increases the frequency of OSA has typically been considered a potential predictor of cybersex addiction (Wéry & Billieux, 2017). Taking these findings into account, the third objective of this study was to explore whether the use of different pornographic content (including both normophilic and paraphilic content) predicted an increased risk of cybersex addiction and whether this risk varied according to the age of the participants (i.e., if the risk related to the use of certain sexual content—e.g., paraphilic content—differs during adolescence, adulthood, or old age).

In short, the aim of this study was threefold. First, we aimed to create a taxonomy of pornographic content based on data from a large sample of pornography users. Using this taxonomy, the second objective of this study was to analyze and compare the use of different pornographic contents in people at different life stages. Finally, the last goal was to explore whether the use of different pornographic content predicts an increased risk of cybersex addiction and whether this risk was modulated by age.

Method

Participants and Procedure

Data acquisition was conducted between 2016 and 2019 through a secured online platform designed Ad Hoc for this research (<https://adiccionalsexouji.es/>). Participants were enrolled through different recruitment strategies: (a) email blast through different institutions’ listservs such as universities and social groups, (b) banners on Facebook, (c) dissemination of the study on radios/newspapers websites, and (d) tear-off flyers in high-density spots. In the dissemination messages of the survey, it was specified that it was an investigation on online and offline sexual behaviors. The survey was also publicly accessible through any search engine by combining terms such as “pornography” OR “online sexual activity” AND “assessment” (in Spanish).

During the time the study was accessible, around 10,000 participants accessed the survey. Of this sample, only 8040 people participated in this study after eliminating subjects who did not identify as males or females; who did not have a homosexual, bisexual, or heterosexual sexual orientation; and who had not completed at least 80% of the survey responses and misleading, inconsistent, and/or false responses (i.e., responses that report unrealistic ages [0 years, 1000 years, etc.], people who claim to spend 200 h or more per week online, etc.).

Instruments

Sociodemographic Characteristics

Participants were asked to report their age, gender (male, female, or other [note that participants answering the late

category were not included in this study]), religions (atheist/non-practicing believer/practicing believer), sexual orientation (heterosexual, bisexual, homosexual, and other [once again, participants answering the late category were not included in this study]), relationship status, sexual intercourse frequency, and political ideology (Likert scale ranging from 0 [left-wing extremist] to 10 [extreme right wing]).

Use of Different Pornographic Contents

First, participants self-reported whether they had ever searched for pornography (*yes/no*). Those who answered positively were asked about the type of pornography they used to search (*When you go online to search for pornographic material, what type of content do you look for?*). Participants were able to answer from a list of 10 specific types of pornography (“sexual intercourse with opposite-sex partners,” “sexual activity involving domination and submission,” etc.). These contents were extracted and adapted from studies assessing preferences for different pornographic contents (Hald, 2006; Hald & Štulhofer, 2016; Tripodi et al., 2015; Wéry & Billieux, 2016) and included normophilic and paraphilic sexual materials. Information on scale content and psychometric properties is reported in detail in the “Results” section.

Cybersex Addiction

Excessive and problematic engagement in cybersex (including problematic pornography use) was assessed through the Spanish version of the Internet Sex Screening Test (ISST, Ballester-Arnal et al., 2010). The ISST, originally developed by Delmonico (1997), evaluates the degree to which the online sexual behavior is excessive and problematic. Twenty-five items on a dichotomous scale (*true/false*) provide a total score ranging from 0 to 25. Ballester-Arnal et al. (2010) reported good internal consistency ($\alpha = 0.88$) and test–retest stability ($r = 0.82$) in a sample of college students between 18 and 25 years old. In our study, internal consistency was excellent ($\alpha = 0.93$; $\omega = 0.93$).

Data Analyses

First, participants were distributed into five groups according to their age: aged from 12 to 17 years old (children and adolescents), from 18 to 25 (young adults), from 26 to 40 (adults), from 41 to 60 (older adults), and over 60 years old (elderly). These age ranges were chosen because they represent typical generational stages used in previous studies (e.g., Smith & Baltes, 1990). This approach is similar to that followed by Price et al. (2016) or by Ballester-Arnal et al. (2021) in similar studies where they also compared pornography consumption in different age groups. Subsequent

analyses were performed comparing participants in these five age groups.

First, participants’ profile in each age group was compared through one-way analyses of variance (ANOVAs) (continuous variables) and chi-square tests (categorical variables). Given the notable sample size, differences between different age categories were analyzed through the effect size instead of the significance level (even when significance was also reported for transparency purposes). Two effect size indices (Cohen’s f for ANOVAs and Cramer’s V for chi-square tests) were computed by using G*Power (version 3.1). For Cohen’s f , effect sizes of about 0.10 were considered small, close to 0.25 moderate, and greater than 0.40 large (Cohen, 1988); for Cramer’s V , these sizes corresponded to values of 0.10, 0.30, and 0.50 (Ellis, 2010).

For the analysis of the consumption of different pornographic contents, we first conducted an exploratory factor analyses (EFA). Through this approach, we aimed to reduce the number of variables involved in data analysis and simplify interpretation of the results by identifying common categories of pornographic materials (i.e., generating a taxonomy of pornographic categories). FACTOR software (version 9.2) was used to conduct this EFA (Lorenzo-Seva & Ferrando, 2013). The main advantage of FACTOR over other statistical software is that it allowed to perform an EFA based on tetrachoric/polychoric correlation matrix. This option is recommended when modeling dichotomous data (such in the case of the scale employed in this research to assess the use of different pornographic contents) (Ferrando & Lorenzo-Seva, 2017). We employed parallel analysis (PA) to determine the number of factors to retain. This analysis was conducted on the basis of the polychoric correlation matrix using the optimal implementation function (Timmerman & Lorenzo-Seva, 2011). Following Gaskin and Happell’s (2014) recommendations, factors were extracted through principal components analysis (PCA) and by using an oblique rotation (Oblimin). Three reliability indices were estimated according to the number of items per factor: Ordinal Cronbach’s alpha and Omega for scales comprising three or more items and the Spearman-Brown reliability for scales comprising only two items (Eisinga et al., 2013). We employed an R package («userfriendlyscience») (Peters, 2014) to obtain these indices.

Then, we compared participants’ use of different pornographic contents in different age groups at two levels: (a) at an item level (i.e., percentages of positive responses to each particular pornographic material across the five age groups, chi-square test) and (b) at a factor level (i.e., average scores in each pornographic category, obtained from the sum of the different pornographic contents consumed, one-way ANOVA). Given the obvious differences between men and women in their preferences for different pornographic contents, these analyses were separated.

Finally, a series of hierarchical linear regressions (one per age group) were performed to explore the predictive power of each pornographic content over cybersex addiction (measured through the ISST). Each pornographic content was introduced into the first block. In order to test the possible moderating role of sex on the relationship between each pornographic content and cybersex addiction, gender interaction terms were entered into the second block.

Results

Sociodemographic Characteristics

The study sample consisted of 8,040 participants divided into five categories: the first (children and adolescents) and the last category (elderly) are less represented (<500 participants) than the remaining categories (n between 1,540 and 2,739). Except in the children and adolescents' group (44.5% males; 55.5% females), most respondents were males (between 60 and 82.9% in the remaining age categories). Regarding their relationship status, the majority of adults, older adults, and elderly (65.6%, 76.4%, and 74.3%, respectively) had a stable partner at the time of the evaluation.

Almost half of the young adults also had a stable partner at the time of the evaluation, while the majority of children and adolescents (55.2%) did not have a stable partner. In all the age groups, the majority of respondents had sex (including solo and partner masturbation) between 1 and 3 times per week. Only minor differences emerged between groups regarding religious ($V=0.07$) and political beliefs ($V=0.09$) (Table 1).

Classification and Prevalence of Use of Different Pornographic Contents

First, we conducted an EFA to group ten different pornographic contents within common categories. The applicability of the EFA was confirmed through the Kaiser–Meyer–Olkin index ($KMO=0.703$), the Bartlett's test of sphericity ($\chi^2(45)=5175.6, p<0.001$), and the determinant of the polychoric correlation matrix (0.346). Parallel analysis (PA) suggested to retain four pornography categories (factor eigenvalues > 1.14). This factorial solution accounted for 77.16% of the variance of the 10 pornographic contents (factor 1: 33.96%; factor 2: 17.46%; factor 3: 14.30%; factor 4: 11.42%). Correlations between these factors were positive and significant ($p<0.001$), especially between "unusual sexual

Table 1 Participants' characteristics according to the age group

	Children and adolescents ($n=373$) % or M (SD)	Young adults ($n=2,739$) % or M (SD)	Adults ($n=2,271$) % or M (SD)	Older adults ($n=1,540$) % or M (SD)	Elderly ($n=466$) % or M (SD)	Inferential statistic	Effect size
Gender							
Male	44.5%	60.0%	82.9%	79.2%	77.3%	$\chi^2=507.50^{***}$	$V=0.26$
Female	55.5%	40.0%	17.1%	20.8%	22.7%		
Age	16.27 (0.95)	21.60 (2.10)	32.24 (4.27)	49.60 (5.71)	66.27 (4.19)	$F=23012.23^{***}$	$f=0.96$
Religious beliefs							
Atheist	49.2%	55.2%	44.3%	43.0%	49.7%	$\chi^2=130.82^{***}$	$V=0.07$
Practicing believer	17.6%	9.4%	13.8%	13.9%	16.1%		
Non-practicing believer	33.2%	34.5%	41.4%	43.1%	34.2%		
Sexual orientation							
Heterosexual	71.0%	73.0%	80.8%	84.6%	92.6%	$\chi^2=161.74^{***}$	$V=0.11$
Bisexual	20.2%	16.0%	8.8%	8.4%	5.0%		
Homosexual	8.8%	11.0%	10.5%	7.1%	2.4%		
Relationship status							
I don't have a partner	55.2%	38.9%	24.2%	17.6%	17.2%	$\chi^2=470.23^{***}$	$V=0.19$
Stable couple	30.3%	47.9%	65.6%	76.4%	74.3%		
Sporadic couple	14.5%	13.2%	10.2%	6%	8.5%		
Sexual intercourse frequency							
Between 5 and 6 times/year or less	13.4%	5.4%	3.8%	4.3%	9.2%	$\chi^2=320.6^{***}$	$V=0.14$
Between 1 and 3 times/month	24.6%	16.9%	14.2%	19.9%	28%		
Between 1 and 3 times/week	53%	60.2%	67.4%	73.5%	62.8%		
More than 3 times/week	9%	17.5%	14.6%	2.3%	0%		

*** $p<.001$

interests (e.g., violent sex, fetish)” and “sexual intercourse” ($\rho=0.566$; $p<0.001$), “soft porn (nonexplicit sex)” and “sexual intercourse” ($\rho=0.400$; $p<0.001$), and “unusual sexual interests” and “chronophilias (paraphilias according to age/maturity categories [we only include children and adolescents in this category])” ($\rho=0.355$; $p<0.001$). Reliability, average scores on each factor, and prevalence of positive responses for each item were included in Tables 2 (males) and Table 3 (females).

As displayed by their increased average score in the general scale, young adults and adults showed a broader range of searches of different kind of pornographic content (M_{males} of 3.41 and 3.51; M_{females} of 2.83 and 2.70). On the contrary, respondents in the elderly category (i.e., > 60 years old) obtained the lower average scores

($M_{\text{males}}=2.29$; $M_{\text{females}}=1.11$). Despite being significant, differences according to the age group reached small effect size ($f_{\text{males}}=0.159$; $f_{\text{females}}=0.181$).

Regarding the preference for particular pornographic contents, average scores in factor 1 (“soft pornography”) and especially in factor 2 (“sexual intercourse”) were notably higher than those obtained in the remaining categories, suggesting that sexual content comprised by these factors represent the most popular pornography in our sample. In both factors, respondents in the five age categories obtained similar average scores. Once again, differences according to the age group were low ($f=0.091$ and $f=0.089$ in males; $f=0.069$ and $f=0.178$ in females), meaning that preferences for these sexual contents slightly varied in the different age groups.

Table 2 Use of different pornographic contents according to the age group (males)

	Children and adolescents ($n=166$) % or M (SD)	Young adults ($n=1,643$) % or M (SD)	Adults ($n=1,881$) % or M (SD)	Older adults ($n=1,220$) % or M (SD)	Elderly ($n=360$) % or M (SD)	Inferential statistic	Effect size
Pornography consumption (yes)	97.3%	97.4%	97%	94%	85.5%	$\chi^2=84.36^{***}$	$V=0.147$
10-item scale on preferred pornographic contents ($\alpha=0.75$; $\omega=0.61$) (range=0–10)	3.29 (1.85)	3.41 (1.80)	3.51 (1.79)	3.16 (1.73)	2.29 (1.56)	$F=24.58^{***}$	$f=0.159$
Soft porn (Spearman-Brown reliability=0.74) (range=0–2)	0.68 (0.91)	0.70 (0.84)	0.84 (0.88)	0.77 (0.87)	0.55 (0.81)	$F=8.11^{***}$	$f=0.091$
Nude people in suggestive postures (naked bodies in suggestive postures)	32.1%	32.2%	39.9%	36.3%	29.7%	$\chi^2=21.12^{***}$	$V=0.075$
Nude people showing their genitals (explicit photos of the genitals)	37.6%	39%	45.4%	39.9%	25%	$\chi^2=35.94^{***}$	$V=0.098$
Sexual intercourse (Spearman-Brown reliability=0.67) (range=0–2)	1.26 (0.60)	1.32 (0.52)	1.28 (0.55)	1.23 (0.58)	1.12 (0.62)	$F=7.00^{***}$	$f=0.089$
Sexual intercourse with opposite-sex partners	71.6%	81.5%	84.5%	82.3%	80.7%	$\chi^2=13.90^{**}$	$V=0.061$
Sexual intercourse with same-sex partners	55%	50.2%	44.8%	42.2%	34.4%	$\chi^2=29.30^{***}$	$V=0.088$
Unusual sexual interests ($\alpha=0.76$; $\omega=0.77$) (range=0–4)	0.97 (0.88)	1.09 (0.96)	1.14 (0.97)	1.03 (0.93)	0.56 (0.64)	$F=17.77^{***}$	$f=0.138$
Sexual intercourse with more than two people	57.8%	65.5%	67.7%	67.2%	46.2%	$\chi^2=41.33^{***}$	$V=0.105$
Sexual activity involving urine and feces	8.3%	5%	7.8%	6.6%	3.3%	$\chi^2=12.38^*$	$V=0.057$
Sexual activity involving domination and submission	22.9%	27.2%	26.5%	23%	6.1%	$\chi^2=47.30^{***}$	$V=0.112$
Rape and/or sexual violence	10.1%	12.6%	13.2%	7.7%	1.9%	$\chi^2=36.84^{***}$	$V=0.099$
Chronophilias (Spearman-Brown reliability=0.63) (range=0–2)	0.39 (0.56)	0.31 (0.49)	0.25 (0.46)	0.12 (0.35)	0.06 (0.24)	$F=33.83^{***}$	$f=0.189$
Sexual activity with children (pedophilia)	3.7%	1.6%	1%	0.9%	0%	$\chi^2=11.51^*$	$V=0.055$
Sexual activity with adolescents (hebephilia)	34.9%	29.4%	23.9%	11.2%	7.5%	$\chi^2=132.69^{***}$	$V=0.188$

* $p<.05$; ** $p<.01$; *** $p<.001$

Table 3 Use of different pornographic contents according to the age group (females)

	Children and adolescents (<i>n</i> = 207) % or <i>M</i> (<i>SD</i>)	Young adults (<i>n</i> = 1,095) % or <i>M</i> (<i>SD</i>)	Adults (<i>n</i> = 387) % or <i>M</i> (<i>SD</i>)	Older adults (<i>n</i> = 320) % or <i>M</i> (<i>SD</i>)	Elderly (<i>n</i> = 106) % or <i>M</i> (<i>SD</i>)	Inferential statistic	Effect size
Pornography consumption (yes)	78.3%	75.3%	83.2%	55.1%	21.3%	$\chi^2 = 112.81^{***}$	$V = 0.270$
10-item scale on preferred pornographic contents ($\alpha = 0.75$; $\omega = 0.61$) (range = 0–10)	2.56 (1.74)	2.83 (1.68)	2.70 (1.68)	2.01 (1.45)	1.11 (0.68)	$F = 10.61^{***}$	$f = 0.181$
Soft porn (Spearman-Brown reliability = 0.74) (range = 0–2)	0.32 (0.62)	0.31 (0.61)	0.35 (0.64)	0.20 (0.50)	0.17 (0.38)	$F = 1.46$	$f = 0.069$
Nude people in suggestive postures (naked bodies in suggestive postures)	11.7%	14.5%	17.5%	10.3%	10%	$\chi^2 = 3.91$	$V = 0.059$
Nude people showing their genitals (explicit photos of the genitals)	21.3%	17.6%	19%	12.4%	20%	$\chi^2 = 3.06$	$V = 0.052$
Sexual intercourse (Spearman-Brown reliability = 0.67) (range = 0–2)	1.23 (0.61)	1.42 (0.64)	1.33 (0.65)	1.12 (0.72)	0.78 (0.55)	$F = 6.87^{***}$	$f = 0.178$
Sexual intercourse with opposite-sex partners	70.2%	89.5%	87.3%	82.5%	80%	$\chi^2 = 28.65^{***}$	$V = 0.159$
Sexual intercourse with same-sex partners	56.4%	59.4%	51.2%	47.4%	10%	$\chi^2 = 14.13^{**}$	$V = 0.123$
Unusual sexual interests ($\alpha = 0.76$; $\omega = 0.77$) (range = 0–4)	0.81 (0.98)	0.99 (0.99)	0.96 (0.98)	0.67 (0.81)	0.17 (0.38)	$F = 5.92^{***}$	$f = 0.137$
Sexual intercourse with more than two people	48.9%	56.2%	58.7%	48.5%	30%	$\chi^2 = 7.40$	$V = 0.081$
Sexual activity involving urine and feces	3.2%	2%	1.2%	2.1%	0%	$\chi^2 = 1.77$	$V = 0.039$
Sexual activity involving domination and submission	21.3%	34.4%	26.6%	23.7%	0%	$\chi^2 = 16.69^{**}$	$V = 0.121$
Rape and/or sexual violence	13.8%	13.2%	14.3%	3.1%	0%	$\chi^2 = 10.45^*$	$V = 0.096$
Chronophilias (Spearman-Brown reliability = 0.63) (range = 0–2)	0.20 (0.43)	0.12 (0.34)	0.06 (0.24)	0.02 (0.13)	0.00 (0.00)	$F = 6.87^{***}$	$f = 0.145$
Sexual activity with children (pedophilia)	1.1%	0.6%	0%	0%	0%	$\chi^2 = 2.75$	$V = 0.049$
Sexual activity with adolescents (hebephilia)	19.1%	12.9%	7.1%	2.1%	0%	$\chi^2 = 21.68^{***}$	$V = 0.138$

* $p < .05$; ** $p < .01$; *** $p < .001$

At an item-level, in males, the prevalence for pornographic contents included in the “soft porn” category varied according to the age group in a range between 25 and 45.4%. While in females, the prevalence ranged from 10 to 21.3%. In both groups, differences according to the age group only reached a small effect size (V of 0.075 and 0.098 in males and V of 0.052 and 0.059 in females). As for contents depicting “sexual intercourse,” prevalence of male participants who used materials such as “sexual intercourse with opposite sex partners” was $> 70\%$ in all the age groups and ranged between 34.4 and 55% for “sexual intercourse with same-sex partners” (V of 0.06 and 0.08). In females, prevalence of use of these sexual contents ranged between 70.2 and 89.5% ($V = 0.15$) and 10 and 59.4% ($V = 0.12$).

Following the terminology proposed in previous studies (Joyal et al., 2015; Tripodi et al., 2015), the third factor was called “unusual sexual interests” (i.e., contents depicting sexual practices not commonly reported during offline sexual relationships). According to the age category, in both genders, average scores on this factor barely varied between children and adolescents and older adults (M_{males} between 0.97 and 1.14 and $M_{females}$ between 0.65 and 0.99), notably decreasing in elderly participants ($M_{males} = 0.56$; $M_{females} = 0.17$). Analyzing the prevalence of contents included in this factor revealed that between 30 and 67.7% of respondents in all the age categories, both in males and females, searched for pornographic contents including “sexual intercourse with more than two people.” Searching for contents depicting “sexual activity involving domination and

submission” was relatively common among children and adolescents and middle-aged categories (reported by > 20% of males and females); however, it decreases considerably in the elderly group in both genders. Contrarily, searching for materials depicting “rape and/or sexual violence” and “sexual activity involving urine and feces” was very uncommon and stable across all the age categories (V_{males} of 0.099 and 0.057; $V_{females}$ of 0.096 and 0.039, respectively), suggesting that these sort of pornography did not represent a major preference in our sample.

The fourth factor (i.e., “chronophilias”) includes pornographic contents reflecting a sexual attraction toward children (pedophilia) or adolescents (hebephilia) (Seto, 2017). Average scores on this factor were extremely low in the five age categories, especially in females. In both genders, averages scores systematically decreased with age (M_{males} of 0.39 in children and adolescents and 0.06 in the elderly; $M_{females}$ of 0.20 and 0, respectively). The highest prevalence was found for “sexual activity with adolescents,” especially in children and adolescents (34.9% males; 19.1% females) and young adults (29.4% males; 12.9% females). This prevalence of respondents searching for hebephiliac contents progressively decreased with age, thus reflecting a loss of interest to the extent that difference between the age of the actors in the pornographic scene and the age of the pornography consumer increased.

Predictive Power of Pornography Contents over Cybersex Addiction

Finally, we tested whether the fact of viewing specific pornographic contents was associated with increased scores in the ISST (i.e., cybersex addiction) (Table 4).

Our results indicated that only some types of pornography were linked to increased scores in cybersex addiction. In all age groups, gender (specifically being male) increased the likelihood of having higher scores on the ISST test. In children and adolescents, the use of three different pornographic contents (“sexual intercourse with more than two people” [$B = 1.41$; $p = 0.016$], “sexual activity involving domination and submission” [$B = 1.48$; $p = 0.038$], and “sexual activity with adolescents” [$B = 1.59$; $p = 0.021$]) were related to cybersex addiction ($R^2 = 31.6\%$; $f = 10.11$; $p < 0.001$). In this age group, only the consumption of pornography involving *sexual intercourse with more than two people*, in interaction with gender (being a male), predicted an increased risk of cybersex addiction.

In young adults, most pornographic content explored significantly explained the 40.5% of the variance of cybersex addiction ($f = 129.22$; $p < 0.001$). As for interactions terms between gender and sexual contents, being a woman and looking for “sexual intercourse with opposite-sex partners” and “sexual intercourse with same-sex partners” were

associated with higher ISST scores ($B = 2.37$, $p < 0.001$, and $B = 0.86$, $p = 0.021$, respectively).

In adults, the vast majority of pornographic contents were associated with a higher ISST scores. As for the interaction terms between gender and sexual contents, searching for “nude people in suggestive postures” and “sexual activity with adolescents” was associated with increased risk of cybersex addiction in men ($B = -1.78$, $p = 0.021$; $B = -2.86$, $p = 0.017$); in women, the risk increased when viewing “sexual intercourse with opposite-sex partners” and “sexual activity involving domination and submission” ($B = 1.65$, $p = 0.031$; $B = 1.81$, $p = 0.011$).

As for older adults and elderly, gender (men) and certain pornographic contents (“nude people showing their genitals,” “sexual intercourse with more than two people,” or “sexual activity with adolescents”) explained the 36.8% and the 40.4% of the variance in the ISST scores, respectively. The interaction between gender and the different pornographic contents did not significantly increase the explanatory power model.

Discussion

In this study, we aimed to (1) generate a data-driven taxonomy of pornographic contents, (2) analyze and compare the use of different pornographic materials in different age groups, and (3) explore whether the use of different pornographic content predicted an increased risk of cybersex addiction. In this sense, we found four categories of pornography to classify the wide variety of normophilic (i.e., vaginal, anal, oral, and group sex) and paraphilic or non-mainstream contents (i.e., sadomasochism, fetish, bondage and dominance, violent coercive, and bizarre/extreme) (Hald, 2006; Hald & Štulhofer, 2016; Štulhofer et al., 2010). As for the preference for different pornographic contents in different age groups, contents depicting sexual intercourse were the most consumed in practically all age groups, with hardly any variation according to age and gender. Other content that may be classified as unusual or uncommon such as sexual relations with more than two people or sexual activity involving domination and submission are also relatively frequent in men and women, although they decrease in the more extreme age ranges (children and adolescents and elderly). Finally, this study provides a nuanced description of which particular pornographic contents increase the risk of cybersex addiction in different developmental stages.

As one of our main objectives, in this study, we have created a taxonomy of pornographic content that comprises four categories: soft pornography, sexual intercourse, unusual sexual interests, and chronophilias. This classification resonates with other more theoretical proposals that have not been empirically proven, such as that proposed by Leonhardt

Table 4 Predictive power of different pornographic contents over excessive and problematic pornography use (ISST)

	Children and adolescents (<i>n</i> = 373)			Young adults (<i>n</i> = 2,739)			Adults (<i>n</i> = 2,271)			Older adults (<i>n</i> = 1,540)			Elderly (<i>n</i> = 466)		
	<i>B</i>	<i>R</i> ²	<i>F</i>	<i>B</i>	<i>R</i> ²	<i>F</i>	<i>B</i>	<i>R</i> ²	<i>F</i>	<i>B</i>	<i>R</i> ²	<i>F</i>	<i>B</i>	<i>R</i> ²	<i>F</i>
Model 1		31.6%	10.11***		40.5%	129.22***		32.7%	70.74***		36.8%	50.74***		40.4%	17.32***
Item 1. Nude people in suggestive postures (naked bodies in suggestive postures)	0.18			0.41			0.27			0.14			-0.47		
Item 2. Nude people showing their genitals (explicit photos of the genitals)	0.76			1.36***			1.86***			2.53***			1.69**		
Item 3. Sexual intercourse with opposite-sex partners	0.58			0.45*			-0.07			0.52			0.74		
Item 4. Sexual intercourse with same-sex partners	0.35			1.32***			0.94***			1.10**			1.50**		
Item 5. Sexual intercourse with more than two people	1.41*			1.03***			1.34***			2.22***			2.21***		
Item 6. Sexual activity involving urine and feces	0.85			1.66***			1.41**			0.26			-0.28		
Item 7. Sexual activity involving domination and submission	1.48*			0.72***			1.103***			2.59***			2.86**		
Item 8. Rape and/or sexual violence	0.96			1.74***			0.98**			0.52			0.46		
Item 9. Sexual activity with adolescents (hebephilia)	1.59*			1.47***			0.99***			1.25**			1.73*		
Item 10. Sexual activity with children (pedophilia)	-0.46			2.41**			-1.21			5.51**			- ^a		
Gender	-3.04***			-3.50***			-4.46***			-3.05***			-1.81**		
Model 2		32.5%	5.98		41.6%	71.23***		33.4%	40.57**		36.9%	28.43		40.8%	12.85
Gender*Item 1	1.93			-0.54			-1.78*			-1.34			3.63		
Gender*Item 2	-3.77			-0.10			1.65*			-0.31			- ^a		
Gender*Item 3	0.84			2.37***			1.43			1.25			2.97		
Gender*Item 4	1.43			0.86*			0.52			-1.48			-1.52		
Gender*Item 5	-2.60*			0.10			-0.29			0.05			-1.03		
Gender*Item 6	-0.26			0.88			-0.63			-0.13			- ^a		
Gender*Item 7	2.73			0.39			1.81*			2.82*			- ^a		
Gender*Item 8	-0.39			0.64			-0.69			-1.54			- ^a		
Gender*Item 9	1.95			-0.78			-2.86*			-1.28			- ^a		
Gender*Item 10	-3.84			-0.87			- ^a			- ^a			- ^a		

^a = empty cells represent interaction terms not included in the regression analysis because of limitations in sample size (typically, because we did not have data from females using these particular pornographic contents)

* *p* < .05; ** *p* < .01; *** *p* < .001

et al. (2019) with their categories sexually suggestive, sexually explicit, and paraphilic, according to the degree of sexual explicitness and the kind of sexual content. Except for the small nuance of the chronophilias where according to our results seem to have some distinction of what could be considered "paraphilic" or "unusual sexual interest", although both categories have a high correlation with each other. On the contrary, our taxonomy differs from that proposed by Hald and Štulhofer (2016). With a methodology similar to that employed in this study, they suggested a classification into three categories, focusing on gender, sexual orientation, or non-mainstream pornographic contents. These differences may be due to the number of participants (being much larger in our study) and, above all, to the age range of the respondents. In our study, we cover much broader age ranges that help us to take into account the differences in the consumption of pornography that can occur at different stages of life (Ballester-Arnal et al., 2021; Ševčíková et al., 2020), offering us a taxonomy of pornographic content with greater validity and internal consistency.

Analyzing the consumption of pornography following this categorization, we observe that, in general, there are hardly any variations in the pornographic content searched based on age, and, following the same line as the most recent research, we show a slight decrease in the consumption of pornography in older adults compared to younger people (Price et al., 2016). The most frequent pornography preferences in both genders in the different age groups explored is classified as normophilic (i.e., sexual intercourse with opposite or same sex partners). These data would not support the hypothesis that some authors hold about the increase in recent decades in exposure to paraphilic pornography, mainly among men, especially that containing sexual violence or child pornography (Davis et al., 2018; Romito & Beltramini, 2015). This hypothesis is given by the apparent increase in aggressive content in pornographic videos, especially the more subtle violence (Bridges et al., 2010; Carrotte et al., 2020) and how viewing of this pornographic material can favor the acquisition of these sexual scripts in offline sexual behaviors (Bridges et al., 2016; Wright, 2011). However, as studies like those of Baer et al. (2015) or Shor and Seida (2019) show, despite the increase in paraphilic content available online, this type of online sexual content is the least consumed by users, as well as the worst valued. Except for the use of online pornography with adolescents' sexual content, whose frequency is logically higher among the group of children and adolescents who would seek sexual practices with their peers, so it could not be considered a paraphilic practice. Our results reflect lower percentages of paraphilic pornography interests than other studies, which may be due to methodological differences, including the characteristics of the participants (clinical vs non-clinical sample, cultural differences, etc.) or the limited list of pornographic content

provided (Hald & Štulhofer, 2016; Neutze et al., 2011; Sun et al., 2015).

Lastly, we explore the relationship between different pornographic content and cybersex addiction. Our results show that only a few types of pornography have been linked to cybersex addiction. Specifically, viewing some pornography content classified as unusual (pornography involving domination or submission or sexual intercourse with more than two people) or paraphilic (chronophilias) is related to cybersex addiction measured by the ISST. Some studies suggest that persistent pornography users may exhibit habituation to normophilic content, which translates into an increase in the use of unusual and extreme pornographic material (Foubert, 2016; Hilton & Clark, 2011; Tripodi et al., 2015). This habituation may be due to the development of tolerance, one of the characteristic symptoms of addictions which, in the particular case of cybersex addiction, may be reflected in a need to seek more exciting and extreme content (i.e., paraphilic) to achieve previous sexual satisfaction (Lewczuk et al., 2021). This phenomenon may explain why the consumption of this particular pornographic content may be related to the development of cybersex addiction. However, as some authors suggest, this relationship may occur in the opposite direction: a previous interest in paraphilic sexual content (in the most severe cases, the presence of a previous paraphilic disorder) may increase the use of the Internet for sexual purposes (Griffiths, 2012; Ross et al., 2012). It would therefore be necessary to further investigate the relationship between these two variables to determine how they are interrelated.

In our study, we also found that the use of non-paraphilic pornographic contents (sexual intercourse with same-sex partners or nude people showing their genitals) increased the risk of developing cybersex addiction, although not in all age groups. This may be due to factors such as anonymity and accessibility, cybersex factors related to its addictive potential (Cooper et al., 1999; Griffiths, 2012). These characteristics of cybersex allow people to experiment with sexuality over the Internet by facilitating access to sexual content that cannot be accessed offline. For example, in sexual relations with same-sex partner –punished in many contexts– or fulfilling certain sexual fantasies that are not easily accessible offline may increase the consumption in people (Castro-Calvo et al., 2018; Giménez-García et al., 2021; Green et al., 2012; Ross et al., 2012). This would explain why factors such as belonging to a sexual minority or sexual dissatisfaction, regardless of having paraphilic sexual attractions or not, have been linked to the problematic cybersex use (Daspe et al., 2018; Studer et al., 2019). Another factor that has been related to a predisposition to problematic cybersex use is gender, specifically being a man (Ballester-Arnal et al., 2021; Weinstein et al., 2015; Wéry & Billieux, 2016). Our results also show this relationship in all age groups; however, in general, the different pornography

content does not affect cybersex addiction in a different way. These data show the need to take into account the type of pornography content consumed online when evaluating addiction to pornography and/or cybersex, regardless of age and gender.

This study is not without its limitations. On the one hand, we find limitations related to the sample, including a smaller sample size in some groups (children, adolescents, and the elderly) and the type of sampling (convenience sampling). Furthermore, as it is a cross-sectional study, we do not take into account the effect of the birth cohort which, as other studies such as Price et al. (2016) or Wright (2013) show, could further enrich the study and provide data on both effects (age and year of birth) on pornography consumption. Another limitation of our study is related to the percentage of women in the sample: the proportion of women in the sample notably decreased with age (in particular, in older age ranges), meaning that women in these age ranges are underrepresented in our research. This underrepresentation of women in older age ranges may be explained by the traditional values and social norms related to the expression of sexuality in women: compared to men, women have been more often judged when expressing their sexual experiences and interests (Lai & Hynie, 2011; Zaikman & Marks, 2017). These negative experiences may explain their lower rates of participation in a study focused on sexual behavior and also explain why younger girls (less exposed to traditional sexual scripts) are more likely to participate and report their sexual experiences. Other sociodemographic variables—such as sexual orientation or cultural differences—have also been related to the use of the Internet for sexual purposes (Bóthe et al., 2020b; Green et al., 2012; Velezmoro et al., 2012) but are not analyzed in this research. Therefore, future studies analyzing the effect that these variables have on the use of pornography in different life stages warrant further research.

Another important limitation of this study is the evaluation of cybersex addiction. Due to the multiple manifestations it represents (including the problematic consumption of pornography) (Varfi et al., 2019), the discrepancies in its definition and diagnostic criteria (Wéry & Billieux, 2017) and the limited number of validated questionnaires, especially in Spanish; in this study we decided to use a more general measure of cybersex addiction to assess the excessive and problematic use of pornography. Our taxonomy of pornography was based on only 10 types of content, not including others such as MILF or hentai that can also be prevalent in society (Ogas & Gaddam, 2011; Pornhub, 2019), which is another limitation. In future studies, it would be interesting to include a greater number of types of pornography, as well as to explore the frequency of use of each type to know if the negative consequences are associated with a single or prolonged viewing (Kingston et al., 2008; Lewczuk et al., 2021), or the level of arousal, being also an important aspect in the development of addiction (Lai

et al., 2013). Despite the limitations described above, we consider that our work provides relevant information on some issues very little studied so far, such as pornographic preferences in men and women in different age groups or how it affects the viewing of specific sexual pornographic content in [cybersex addiction](#), among others.

Conclusions

Firstly, this study allows us to obtain a taxonomy of pornographic content composed of four categories in which both paraphilic and non-paraphilic contents are included, through a sample that encompasses different developmental stages.

In second place, the findings of this study showed that pornography consumption is relatively frequent in different age groups, especially in men, and that hardly varies throughout life. In addition, the pornographic content classified as normophilic is the most frequently consumed in all ages.

Finally, factors such as gender and the consumption of unusual or paraphilic pornography and even some content that can be classified as normophilic can be related to the risk of cybersex addiction at different life stages.

These data show that pornography is something common in the population and is currently part of the sexuality of pre-adolescents, adolescents, adults, and the elderly. For this reason and for the differences found, especially with regard to the risk of addiction, it is important to take into account generational differences when taking preventive approaches and promoting healthy use of the Internet for sexual purposes.

Author Contribution RBA and MDGL contributed to study design, obtaining funding, and/or study supervision. RBA, MDGL, JCC, MGB, and CGG participated in recruiting participants, collecting data, and analysis/interpretation of data. RBA, MGB, and JCC participated in writing of the paper.

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Data Availability Not applicable.

Code Availability Not applicable.

Declarations

Ethics Approval The study procedures were carried out in accordance with the Declaration of Helsinki. The Institutional Review Board of the

Jaume I University approved the study. All participants in the research were informed about the study and gave their consent.

Informed Consent All participants in the research were informed about the objectives of the survey, completion times, as well as about the anonymity and confidentiality of the responses and the right to stop the survey in any point and for any reasons. After reading all information, participants had to give their consent to participate in the online survey by clicking on the bottom “I accept to take part in the survey.”

Conflict of Interest The authors declare no competing interests.

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