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ORIGINAL PAPER

Actual and Desired Masturbation Frequency, Sexual Distress, and Their Correlates

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Abstract

We investigated the prevalence of problematic masturbation using different criteria. We also investigated if masturbation-related distress was associated with sexual abuse history, family attitudes towards sexuality during childhood, and depression and anxiety symptoms. Here, 12,271 Finnish men and women completed a survey reporting masturbation frequency, desired masturbation frequency, sexual distress, childhood sexual abuse, sex-positive family background, as well as depression and anxiety symptoms. Among both sexes, those whose masturbation frequency did not match with desired frequency experienced more sexual distress. Different conceptualizations of problematic masturbation resulted in different proportions of individuals categorized as having it (i.e., 8.3% of men and 2.7% of women experienced self-perceived problematic masturbation, that is masturbating more than they desired and experiencing sexual distress; 2% of men and 0.6% of women masturbated more frequently than average and meanwhile experienced self-perceived problematic masturbation; 6.3% of men and 2.1% of women masturbated less frequently than average but still experienced self-perceived problematic masturbation). Moreover, among both sexes, self-perceived problematic masturbation was positively associated with childhood sexual abuse, depression, and anxiety, while negatively associated with a sex-positive family background. Our results point to the complexity of defining problematic masturbation. Causes of sexual distress related to masturbation need to be carefully examined case by case to choose an appropriate clinical approach.

Keywords Masturbation · Sexual distress · Compulsive sexual behavior · Finnish

Introduction

Masturbation (i.e., self-stimulation of one's own genital organs for purposes of sexual gratification) is a common sexual practice worldwide (Carvalheira & Leal, 2013; Das, 2007; Gerressu et al., 2008; Richters et al., 2014). People engage in solo masturbation for physical pleasure, as well as mutual masturbation to add variation to partnered sex. Regardless of its frequency, some individuals report stress associated with masturbation (Derbyshire & Grant, 2015; Grant et al., 2014; Reid et al., 2010; Spenhoff et al., 2013; Walton et al., 2017). Masturbation may also cause problems in sexual relationships. However, what constitutes problematic masturbation is ill-conceived and more research addressing the impact of masturbation and its correlates is needed. We investigated different ways of defining problematic masturbation (i.e., whether self-perceived, associated with significant distress, or having an above-average frequency), examined associated factors, and then discussed what kinds of interventions may be most appropriate in different situations.

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Masturbation

Masturbation involves the manipulation of one's own genital organs, typically the penis or clitoris, for purposes of sexual gratification (American Psychiatric Association, 2013). The act is usually accompanied by sexual fantasies or erotic literature, pictures, or videos and may also include the use of mechanical devices (e.g., a vibrator) or self-stimulation of other body parts, such as the anus or nipples. Masturbation is a common sexual behavior with, for example, 60% of men

and 36.5% of women engaging in it over the preceding month in a US sample (Herbenick et al., 2023). The corresponding figures in a UK 16–44-year-old sample were 73% and 37% (Gerressu et al., 2008). Similar prevalence rates have been found in other regions (Carvalheira & Leal, 2013; Richters et al., 2014) with lower prevalence reported, for example, in China where 13% of women and 35% of men had masturbated in the preceding year (Das et al., 2009). Women generally report less masturbation than men.

Given that masturbation is common, it is crucial to understand its role in psychological well-being. Historically, masturbation has been prohibited in many religions and cultures given its sole focus on pleasure (Buaban, 2021; Bullough, 2003; Chakrabarti et al., 2002). Recently, this has changed. Masturbation is now considered an important pathway for adolescents to learn about their bodies and sexual responsiveness (Atwood & Gagnon, 1987).

Compulsive Sexual Behavior

Compulsive sexual behavior, also called hypersexuality or sex addiction, involves difficulties controlling sexual impulses, which may cause psychological distress and problems in relationships and interference with regular life (Derbyshire & Grant, 2015; Grant et al., 2014; Reid et al., 2010; Spenhoff et al., 2013; Walton et al., 2017). The prevalence is between 2 and 6% depending on definitions (Coleman, 1992; Kuzma & Black, 2008; Malandain et al., 2020; Odlaug et al., 2013). The prevalence is believed to be higher in men than women and among sex offenders and sexual minorities (Carnes, 2013; Hanson & Morton-Bourgon, 2005; Kafka, 1997; Kelly et al., 2009; Kingston & Bradford, 2013; Kuzma & Black, 2008). For example, a Swedish study found 2% prevalence for women and a 5% for men (Ross et al., 2012). However, how to define compulsive sexual behavior is unclear as is whether it is a helpful diagnostic category. Clearly, it is difficult to estimate prevalence if there is disagreement concerning the definition (Walton et al., 2017). Yet, scholars also report concerns regarding standardized definitions. For example, since evidence concerning the etiology of compulsive sexual behavior is unclear, diagnoses may pathologize normal behavior (Walton et al., 2017) and may be misused in legal settings (Goodman, 2001; Halpern, 2011; Walton et al., 2017). At the moment, the *International Statistical Classification of Diseases and Related Health Problems-11* (ICD-11) has a diagnosis of "compulsive sexual behavior disorder," whereas the *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition* does not (American Psychiatric Association, 2013; World Health Organization, 2019).

The Difficulty in the Diagnosis of Compulsive Sexual Behavior: ICD-11 vs. DSM-5

According to ICD-11 (World Health Organization, 2019), compulsive sexual behavior disorder is described as "a persistent pattern of failure to control intense, repetitive sexual impulses or urges resulting in repetitive sexual behavior." Symptoms associated with compulsive sexual behavior disorder may include constantly engaging in the same sexual activities over and over again and that this has become a major obstacle to maintaining a normal daily life and healthy relationships; having troubles in regulating oneself and reducing the repetitive behavior; triggering significant distress about the sexual behavior; causing difficulties in functioning in other important areas of life; and those symptoms usually last for a fair amount of time (e.g. 6 months or more) (World Health Organization, 2019).

The Sexual and Gender Identity Disorders Work Group[1] submitted a proposal to include hypersexuality in DSM-5, but this was rejected (Grant et al., 2014). Rather, compulsive sexual behavior may be considered as a subcategory of other related mental disorders, specifically impulsive control disorder or a type of addiction.

The Typology of Hypersexuality and Problematic Masturbation

Given that the clinical presentation of individuals who seek professional help for sexually compulsive behavior is diverse, Cantor et al. (2013) proposed a typology. Six types were suggested, including Paraphilic Hypersexuality, Avoidant Masturbation, Chronic Adultery, Sexual Guilt, the Designated Patient, and a situation better accounted for as a symptom of another condition (Cantor et al., 2013). For example, paraphilic hypersexuality involves the patient reporting high frequencies of one or more sexual behaviors and related distress, along with subclinical paraphilic interests (Cantor et al., 2013). Another subtype is avoidant masturbation in which the patient complains about spending an inordinate time viewing pornography and masturbating (Cantor et al., 2013). This may also be a coping mechanism to avoid a task or a chore (Cantor et al., 2013). Both types involve incapability of controlling sexual activities, or specifically masturbation, that has caused marked distress

[1] Sexual and Gender Identity Disorders Work Group: a work group of qualified specialists who are experts in issues regarding sexual dysfunction, gender identity disorders, and hypersexuality, that gives critical appraisals of the relevant diagnoses that appeared in the DSM-IV (or earlier), along with proposed suggestions for reform and revision.
Reference: Zucker, K. J. (2009). Reports from the DSM-V Work Group on Sexual and Gender Identity Disorders. *Archives of Sexual Behavior*, *39*(2), 217–220. https://doi.org/10.1007/s10508-009-9548-9

or other dysfunction in life. According to population-based research in Denmark, 8% of men and 10% of women reported feeling ashamed that they masturbate, and about 20 to 30 percent of them also did not want their partner to know that they masturbate (Frisch et al., 2019). This means that distress or worries about masturbation is not rare. Also, sexual guilt type involves relatively low frequency of specific sexual behavior but self-labeling as being hypersexual together with severe distress (Cantor et al., 2013). Based on the above, three dimensions should be considered when assessing compulsive sexual behavior: the frequency of engaging in the behavior, the ability to control it, and the severity of related distress. In the present study, we specifically investigated problematic masturbation by measuring masturbation frequency, desired masturbation frequency, and sexual distress, expecting to unveil subtypes.

Etiology

Childhood Trauma

Compulsive sexual behavior disorder is related to high rates of childhood traumas (World Health Organization, 2019). Parenting style impacts people's attitudes towards masturbation (Kaestle & Allen, 2011; Klukas et al., 2021). Young adults are likely to interpret silence as a disapproval of masturbation (Kaestle & Allen, 2011). For example, Klukas et al. (2021) found that university students who had not discussed masturbation with their parents had more negative attitudes than those who had discussed it. Klukas et al. also investigated parenting styles, the amount of support a child received, and the amount of control applied by the parents. Children who grew up with low support and high control parents (i.e., authoritarian parenting) reported more negative attitudes toward masturbation (Klukas et al., 2021; Maccoby & Martin, 1983). Also, individuals with compulsive sexual behavior often come from dysfunctional families with 87% reporting disengaged parents and 77% rigid families (Augustine Fellowship, 1986). Hence, experiences of problematic parenting during one's childhood may lead to maladaptive relationships with sexual behavior in adulthood.

Childhood abuse is another factor potentially contributing to compulsive sexual behavior. A US study found that among those who have compulsive sexual behavior, 22% reported childhood physical abuse history and 31% reported sexual abuse history (Black et al., 1997). These prevalence rates are higher than the rate in the general population (US Department of Health and Human Services, 2013). In the case of sexual abuse, sexual behavior in adulthood may be a way of re-enacting what happened in the abusive situation, as a way of forming control and taking back what has been exploited (Giugliano, 2006; Gold & Heffner, 1998; Hall, 2011; Krupnick & Horowitz, 1981). Overall, emotionally disturbing experiences at an early stage of life seems to be a risk factor for compulsive sexual behavior presented in adulthood.

The Current Study

The present study aimed to assess problematic masturbation in the Finnish population, using different criteria, and to discuss how to define problematic masturbation. We investigated the prevalence rates when defining problematic masturbation by individuals who masturbated more than they desired or when they experienced sexual distress about their behavior. We also looked at whether the participants' actual masturbation frequency was above the average masturbation frequency of the general population. We also investigated if masturbation-related distress was associated with sexual abuse history, family attitudes towards sexuality during childhood, and depression and anxiety symptoms. We hypothesized that first, different definitions of problematic masturbation would result in different proportions of people experiencing problematic masturbation, suggesting different classification and diagnosis standards of compulsive sexual behavior. Second, masturbation-related distress would be positively associated with sexual abuse history, negative family attitudes, higher levels of depression and anxiety symptoms. Ultimately, we wanted to provide insights for clinical practice.

Method

Participants

The present study was based on a sample consisting of 12,271 Finnish twins and their siblings between 18 and 49 years of age (men, $n = 4322$, $M = 29.26$ years, $SD = 6.68$ and women $n = 7949$, $M = 28.92$, $SD = 6.80$). The twins were part of the Genetics of Sex and Aggression project that aimed to investigate human sexuality related phenotypes, including sexual function, sexual behavior and its variations, and aggressive behavior. A number of psychometric instruments were also used to measure behaviors and attitudes related to eating, and psychopathology such as anxiety and depression. Participants were ascertained from the Central Population Registry of Finland, which is a government-based registry including personal information of all Finnish citizens, and they responded to questions via a survey. Two separate data collections were undertaken: the first one was conducted in 2005 ($n = 3163$, men $n = 1175$, women $n = 1988$) and the

second one in 2006 ($n = 9108$, men $n = 3147$, women $n = 5961$). More details of the data collection procedures can be found in Johansson et al. (2013).

The following instruments used in the present study were available for participants from both data collections: Masturbation Frequency, Desired Masturbation Frequency, Childhood Trauma Questionnaire, and Brief Symptom Inventory. Sexual Distress Scale and Sexual History and Adjustment Questionnaire were only available for the second data collection. This means that the analyses involving questions about sexual distress and family history interest included 9108 participants whereas all the other analyses included the complete (male and/or female) sample.

Measures

All questions were asked in Finnish of the participants and had been translated from psychometric measures which were originally in English. For the measures specifically created for the present study, the Finnish questions were back-translated into English for the purposes of the present manuscript.

Masturbation Frequency and Desired Masturbation Frequency

Individuals were asked how frequently they engaged in masturbation and their ideal masturbation frequency using an eight-point response scale taken from Derogatis Sexual Function Inventory, where "0" was "not at all," "1" was "less than once per month," "2" was "1–2 times per month," "3" was "once per week," "4" was "2–3 times per week," "5" was "4–6 times per week," "6" was "once per day," "7" was "2–3 times per day," and "8" was "more than 4 times per day" (Derogatis & Melisaratos, 1979).

We created a variable labeled as "Gap between Actual and Desired Masturbation Frequency" (henceforth Gap), calculated as Desired Masturbation Frequency minus Masturbation Frequency. If the value is below zero, it suggests that one masturbates more than one desires, whereas if the value is above zero, it suggests that one masturbates less than one desires. The value indicates the level of discrepancy between the desired frequency and the actual frequency. A dichotomous variable was also created so that if the value was below zero, then it was regarded as masturbating more than desired, while the rest was regarded as masturbating as much or less than desired.

Sexual Distress Scale

Both male and female participants' sexual distress was measured by seven gender-neutral items from the Female Sexual Distress Scale, measuring in past 30 days, including today: "How often did you feel anxious about your sexuality?," "How often did you feel guilty about your sexual difficulties?," "How often did you feel stressed about sex?," "How often did you feel sexually inadequate?," "How often did you feel regrets about your sexuality?," "How often did you feel embarrassed about sexual problems?," and "How often did you feel dissatisfied with your sex life?" (Carpenter et al., 2015; Derogatis et al., 2002). Participants rated on a five-point Likert scale where "0" was "never," "1" was "rarely," "2" was "occasionally," "3" was "often," and "4" was "always" (Carpenter et al., 2015; Derogatis et al., 2002).

Studies among women have shown that the Female Sexual Distress Scale has high test–retest reliability and a strong internal consistency coefficient (Cronbach's alpha) ranging from 0.86 to 0.90 s, as well as a good discriminant validity (Bae et al., 2006; Carpenter et al., 2015; Derogatis et al., 2002, 2008). Since questions in the Female Sexual Distress Scale are not always formulated in a gender-specific context, it has been applied to male samples and has revealed similar reliability and validity in differentiating men with and without sexual distress (Santos-Iglesias et al., 2020). Thus, we used the Sexual Distress Scale both for men and women for our study. Cronbach's alpha of the current sample was 0.89.

As the level of distress is a crucial measure to determine whether the behavior is significant to cause mental health concern, we decided to use a cutoff point to differentiate those who were troubled by their sexuality and those who were not. According to Derogatis et al. (2002, 2008), a criterion score of ≥ 15 was suggested as a cutoff to validly distinguish the presence of sexual distress in the 12-item reduced scale. Applying it to the 7-item scale, 8.75 is the cutoff score. However, this would lead to too many participants categorized as experiencing sexual distress (i.e., 25.6% of men and 35.2% of women). Instead, we categorized those who scored one standard deviation above the mean as sexually distressed individuals on our 7-item scale, since those were the people who reported a remarkably higher distress level compared with the average. In this case, men (M = 5.9, SD = 4.98, n = 3064) who scored above 10.88 and women ($M = 7.03$, $SD = 5.44$, $n = 5871$) who scored above 12.46 were regarded as experiencing sexual distress. It resulted in the same size (i.e., 17.1%) of both genders defined as having sexual distress.

Self-Perceived Problematic Masturbation

Combining information from the two dichotomous variables Gap and Experienced Sexual Distress, we created a new variable: Self-Perceived Problematic Masturbation with four groups: "masturbation frequency as or less than desired, no sexual distress," "masturbation frequency more than desired, no sexual distress," "masturbation frequency as or less than desired, sexual distress," and "masturbation frequency more than desired, sexual distress."

Sexual Abuse Subscale of the Childhood Trauma Questionnaire (CTQ)

We used the subcategory of sexual abuse from the Childhood Trauma Questionnaire, which contains five questions about childhood sexual abuse (Bernstein et al., 2003). For example, participants were asked if they were touched in a sexual way, if someone tried to make them do sexual things, etc., and they reported on a five-point Likert-type scale with response options ranging from "1" = "never" to "5" = "very often" (Bernstein et al., 2003). Studies have shown that the CTQ Sexual Abuse subscale has high reliability and validity with test–retest reliability coefficients ranging from. 79 to. 86 and a Cronbach's alpha ranging from. 66 to. 92 (Liebschutz et al., 2018). A higher score indicates that one has experienced more frequent sexual abuse during one's childhood. In this study, the Cronbach's alpha of CTQ Sexual Abuse was 0.89.

Sex-Positive Family Background

Seven items from the Sexual History and Adjustment Questionnaire were used to evaluate parental attitudes towards sexuality that participants experienced in their family before they were 16 years old, including the degree of comfort they felt in talking about sexual matters with their mother and father, how they would characterize their mother's and father's attitude toward sexuality when they were growing up, "Overall, how well do you feel that your upbringing prepared you to deal with issues of sexuality and sexual relationships?," "How often do you remember issues of sexuality being discussed in your home when you were growing up?," and "In general, how often was there physical contact/affection displayed in your family?" (Fisher et al., 2013). We also added a question about childhood experiences with nudity: "In your family, what was the attitude like towards nudity during your childhood?" Participants responded to all the questions on a five-point Likert scale with response options ranging from "1" = "extreme discomfort/negative" to "5" = "extreme comfort/positive" for questions about comfortableness and attitudes; or "1" = "almost never" to "5″ = "very often" for questions about frequency (Fisher et al., 2013). The subscale of Overall Attitudes, including Maternal Attitudes Subscale and Paternal Attitudes Subscale, has revealed a Cronbach's alpha of 0.78 (Fisher et al., 2013). The mean of the eight questions was computed and coded as Sex-Positive Family Background, where a higher value suggested a more positive family background about sexuality. In this study, Cronbach's alpha of Sex-Positive Family Background in the Sexual History and Adjustment Questionnaire was 0.82.

We did a factor analysis to test the scale appropriateness. The inter-item correlations varied between 0.21 and 0.62 and were all significant. KMO was 0.82 and Bartlett's Test of Sphericity was significant $\chi^2(28) = 23{,}167.13$, $p < .001$. Scree plot indicated the presence of one factor (Eigenvalue 3.67 when the next Eigenvalue was 1.10) that captured 45.9% of the variance. All factor loadings exceeded 0.58 with the highest loading item being "How often do you remember issues of sexuality being discussed in your home when you were growing up?" These results demonstrate that the scale was unidimensional and usable.

Depression and Anxiety in the Brief Symptom Inventory (BSI)

Lastly, we assessed participants' depression and anxiety symptoms by using the Brief Symptom Inventory (Derogatis, 1993). Six questions were asked to evaluate depression: for example, "During the past 7 days, how much were you feeling hopeless about the future?" and another six questions were asked to evaluate anxiety, for example "During the past 7 days, how much were you distressed by nervousness or shakiness inside?" (Derogatis, 1993). Participants reported from a five-point Likert scale with response options ranging from "0" = "not at all" to "4" = "extremely." Previous research provided proof for good internal consistency reliability and validity (Conoley & Kramer, 1989; Derogatis, 1993). Higher scores indicated more symptoms of depression and anxiety. In this study, the Cronbach's alpha of BSI Depression was 0.84 and BSI Anxiety was 0.85.

Statistical Analyses

Statistical analyses proceeded in three stages via SPSS for Mac (Version 28): First, since the sample contains data from twins and their siblings, we conducted Generalized Estimating Equations (GEE) accounting for dependencies of responses of members of the same family. Using GEE, we examined gender differences in masturbation frequency, desired masturbation frequency, and sexual distress. Second, we evaluated the percentage of participants experiencing problematic masturbation when using different assessments by conducting descriptive analyses and GEE. Third, we investigated if masturbation-related distress was dependent on related factors (i.e., sexual abuse, family attitudes towards sexuality during childhood, depression, and anxiety symptoms) using Pearson correlations and GEE.

Results

Demographic Information

Table 1 presents the general characteristics of the sample.

Table 1 General characteristics of the sample

Demographic information	Men (n = 4322)	Women (n = 7949)
Age	M = 29.26, SD = 6.68	M = 28.92, SD = 6.80
Relationship status	70.72% has a partner	79.24% has a partner
Number of brothers and sisters in addition to the twin sibling	M = 2.28, SD = 2.13	M = 2.05, SD = 1.85
Age of first-time sex	M = 18.00, SD = 3.18	M = 17.34, SD = 2.76
Number of sexual partners within the past year	M = 1.84, SD = 4.23	M = 1.47, SD = 1.78

Masturbation Frequency

A GEE was conducted to compare the two genders regarding masturbation frequency. The results showed that men (M = 3.18, SD = 1.80, n = 4322) masturbated more than women (M = 1.62, SD = 1.45, n = 7949), Wald $\chi^2(1) = 2207.10$, $p < .001$. Table 2 presents the exact masturbation frequency distributions among men and women.

Table 3 presents the desired masturbation frequency distributions among men and women.

Gap Between Actual and Desired Masturbation Frequency

A GEE was conducted to compare gender differences in the gap of masturbation frequency between actual and desired levels. The results showed that men (M = -0.47, SD = 1.26, n = 3987) scored lower than women (M = -0.01, SD = 0.85, n = 7432), Wald $\chi^2(1) = 428.40$, $p < .001$. Sixty-two point three percent of men (n = 3987) reported a balanced level of masturbation, meaning that they masturbated as frequently as they desired, while 30.2% of them reported masturbating more than they wanted and 7.5% reported masturbating less than they wanted. On the other hand, 76.2% of women (n = 7432) reported a balanced level of masturbation, meaning that they masturbated as frequently as they desired, while 11.9% of them reported masturbating more than they wanted and 11.9% reported masturbating less than they wanted. Table 4 presents the exact response distributions among men and women on this variable.

A GEE was conducted to compare differences of the masturbation frequency between those who masturbated more than desired and those who did not. The results showed that among men, those who masturbated more than desired reported higher masturbation frequency (M = 3.71, SD = 1.53, n = 2781) compared with the rest (M = 3.01, SD = 1.84, n = 1206), Wald $\chi^2(1) = 151.32$, $p < .001$. Among women, those who masturbated more than desired also reported higher masturbation frequency (M = 2.5, SD = 1.36, n = 882) compared with the rest (M = 1.52, SD = 1.42, n = 6550), Wald $\chi^2(1) = 374.82$, $p < .001$.

Sexual Distress

A GEE was conducted to compare gender differences on the continuous sexual distress variable. The results showed that women (M = 7.03, SD = 5.44, n = 5871) experienced higher sexual distress than men (M = 5.9, SD = 4.98, n = 3064), Wald $\chi^2(1) = 92.45$, $p < .001$.

Another GEE was conducted to compare differences in sexual distress between those who masturbated more than desired and those who did not. The results showed that men who masturbated more than desired reported higher level of sexual distress (M = 7.75, SD = 5.46, n = 883) compared with the rest (M = 5.17, SD = 4.57, n = 2065), Wald $\chi^2(1) = 154.04$, $p < .001$. Similar results were found in women as well so that those who masturbated more than desired reported higher level of sexual distress (M = 8.28, SD = 5.34, n = 673) compared with the rest (M = 6.89, SD = 5.43, n = 5069), Wald $\chi^2(1) = 40.00$, $p < .001$.

A GEE was conducted to compare the effect of the discrepancy between masturbation frequency and desired masturbation frequency on sexual distress. As shown in Fig. 1a, for men, Pairwise Contrasts indicated that the mean scores of sexual distress of those who masturbated more than desired (M = 7.75, SD = 5.46, n = 883), as well as those who masturbated less than desired (M = 7.17, SD = 5.93, n = 133), were significantly higher compared to those who reported a balanced masturbation frequency (M = 5.03, SD = 4.44, n = 1932) [Wald $\chi^2(2) = 178.34.00$, $p < .001$]. For women, as shown in Fig. 1b, all three groups differed from each other [Wald $\chi^2(2) = 202.49$, $p < .001$]. Post Hoc comparisons indicated that the mean scores of sexual distress of those who masturbated more than desired (M = 8.28, SD = 5.34, n = 673), significantly differed from those who masturbated less than desired (M = 9.62, SD = 5.81, n = 636). Both groups also significantly differed from those who reported a balanced masturbation frequency (M = 6.49, SD = 5.26, n = 4433). This shows that for both men and women, sexual distress may come from masturbating more than one desires, but also from not meeting the desired frequency.

Among those men who masturbated frequently (i.e., more than once per day), 26 out of 90 (i.e., 28.9%) experienced sexual distress, and among those women who masturbated frequently (i.e., more than once per day), 3 out of 13 (i.e., 20.1%)

Table 2 Distribution of masturbation frequency among men and women

Masturbation frequency	Men (%) (n = 4322)	Women (%) (n = 7949)
Not at all	9.2	26.9
Less than once/month	11.1	27.2
1–2 times/month	14.2	19.8
Once/week	18.4	13.5
2–3 times/week	25.5	9.1
4–6 times/week	11.1	2.5
once/day	8.1	0.8
2–3 times/day	2.1	0.2
> 4 times/day	0.3	0.0

Table 3 Distribution of desired masturbation frequency among men and women

Desired masturbation frequency	Men (%) (n = 3987)	Women (%) (n = 7432)
Not at all	16.9	29.5
Less than once/month	13.0	24.2
1–2 times/month	13.3	18.9
Once/week	20.0	14.4
2–3 times/week	20.1	9.5
4–6 times/week	8.0	2.2
Once/day	6.5	1.2
2–3 times/day	1.5	0.1
> 4 times/day	0.6	0.0

Table 4 Distribution of gap among men and women

Gap	Men (%) (n = 3987)	Women (%) (n = 7432)
− 8	0.0	0.0
− 7	0.0	0.0
− 6	0.4	0.0
− 5	0.8	0.1
− 4	2.2	0.3
− 3	4.4	1.1
− 2	8.3	2.9
− 1	14.1	7.5
0	62.3	76.2
1	5.2	8.0
2	1.4	2.7
3	0.5	0.8
4	0.3	0.3
5	0.1	0.0
6	0.0	0.1
7	0.0	0.0
8	0.10	0.0

If the value is below zero, it suggests that one masturbates more than one desires, whereas if the value is above zero, it suggests that one masturbates less than one desires. The value indicates the level of discrepancy between the desired frequency and the actual frequency. If the value is zero, it means that one masturbates as frequently as one desires

experienced sexual distress. This means that frequent masturbation is not necessarily associated with sexual distress.

Different Definitions of Problematic Masturbation

Three dimensions of problematic masturbation assessment are determined by the following variables: the frequency of engaging in the behavior, determined by the discrepancy between masturbation frequency of the individual and the average masturbation frequency of the sample; the ability to control it, determined by the discrepancy between masturbation frequency and desired masturbation frequency; and the severity of related distress, determined by the score of sexual distress scale. As shown in Table 5, different assessments of problematic masturbation (i.e., masturbating more than one desired or not, experiencing sexual distress or not, the masturbation frequency being above average frequency or not) resulted in different percentages of individuals that could be categorized as having problematic masturbation.

The Association between Gender and Problematic Masturbation

A series of GEE were performed to assess the relationship between gender and problematic masturbation. First, there was a significant association between gender and self-perceived problematic masturbation, Wald $\chi^2(1, n = 8690) = 5.42$, $p = .020$, where 8.3% men and 2.7% women reported self-perceived problematic masturbation. There was also a significant association between gender and those who masturbated less than average but still experienced sexual distress, Wald $\chi^2(1, n = 4464) = 23.33$, $p < .001$, where among those whose masturbation frequency was less than average, 11.5% men and 15.3% women reported experiencing sexual distress. Third, there was a significant association between gender and those who masturbate less than average but still had self-perceived problematic masturbation, Wald $\chi^2(1, n = 4333) = 30.43$, $p < .001$, where among those whose masturbation frequency was less than average, 6.3% men and 2.1% women reported self-perceived problematic masturbation.

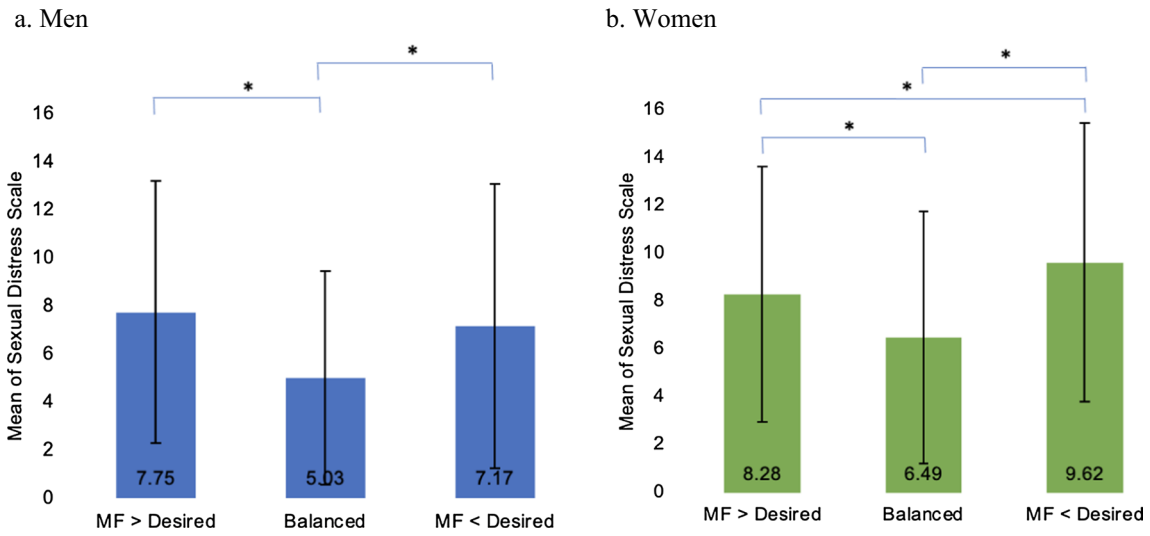

Fig. 1 Mean of sexual distress scale among men and women with different discrepancies between masturbation frequency and desired masturbation frequency. *Note*: "MF > Desired" refers to masturbation frequency more than desired; "Balanced" refers to masturbation frequency as desired; "MF < Desired" refers to masturbation frequency less than desired. *Indicated that there was a significant difference between two groups

Table 5 Frequencies of problematic masturbation among men and women using different definitions

Definition of problematic masturbation	Men (%)	Women (%)
Masturbation frequency more than desired	30.2 ($n = 3987$)	11.9 ($n = 7432$)
Self-perceived problematic masturbation (i.e., masturbation frequency more than desired and experiencing sexual distress)	8.3 ($n = 2948$)	2.7 ($n = 5742$)
Masturbation frequency above average, experiencing self-perceived problematic masturbation	2 ($n = 2948$)	0.6 ($n = 5742$)
Masturbation frequency below average, experiencing self-perceived problematic masturbation	6.3 ($n = 2948$)	2.1 ($n = 5742$)

The Association between Masturbation Frequency Below or Above Average and Problematic Masturbation

Two GEE were performed to assess the relationship between those who masturbated below or above average and sexual distress, as well as self-perceived problematic masturbation, separately examining men and women. The results showed that among men, there was a significant association between masturbation frequency below or above average and sexual distress, Wald $\chi^2(1, n = 3064) = 160.61$, $p < .001$. There was also a significant association between masturbation frequency below or above average and self-perceived problematic masturbation, Wald $\chi^2(1, n = 2948) = 79.23$, $p < .001$. Among women, there was a significant association between masturbation frequency below or above average and sexual distress, Wald $\chi^2(1, n = 5871) = 65.58$, $p < .001$. Additionally, there was a significant association between masturbation frequency below or above average and self-perceived problematic masturbation, Wald $\chi^2(1, n = 5742) = 22.98$, $p < .001$.

Influences of Related Factors on Self-perceived Problematic Masturbation

A series of GEE were computed to analyze how self-perceived problematic masturbation related to sexual abuse, sex-positive family background, depression and anxiety symptoms. As shown in Table 6, for both sexes, self-perceived problematic masturbation was positively associated with sexual abuse, depression, and anxiety, while negatively associated with sex-positive family background.

Next, a series of GEE were conducted to compare how different subgroups in self-perceived problematic masturbation were affected by different related factors (i.e., sexual abuse, sex-positive family background, depression and anxiety symptoms) differently. For men, the results revealed that Sexual Abuse [Wald $\chi^2(3, 2905) = 15.32$, $p = .002$], Sex-Positive Family Background [Wald $\chi^2(3, 2942) = 30.92$, $p < .001$], Depression [Wald $\chi^2(3, 2906) = 330.31$, $p < .001$], and Anxiety [Wald $\chi^2(3, 2906) = 183.99$, $p < .001$] all had different levels in the subgroups of self-perceived problematic masturbation (see Fig. 2a–d). For women, similar results were found that Sexual Abuse [Wald $\chi^2(3, 5733) = 37.42$, $p < .001$], Depression [Wald $\chi^2(3, 5668) = 430.95$, $p < .001$], and Anxiety [Wald $\chi^2(3, 5650) = 272.10$, $p < .001$] had significantly different levels in the subgroups of self-perceived problematic masturbation (see Fig. 2e–g).

Lastly, we conducted a series of GEE among those whose masturbation frequency was below average, comparing if related factors especially had negative effects on them. As shown in Table 7, Sex-Positive Family Background, Depression, and Anxiety had significantly negative effects on self-perceived problematic masturbation among both men and women.

Discussion

We found that those who masturbated more than desired reported higher masturbation frequency, although men reported a generally higher masturbation frequency and experienced less sexual distress compared with women. Also, for both men and women, those who masturbated more or less than desired turned out to experience more sexual distress compared to those whose masturbation frequency was as desired. Importantly, different conceptualizations of problematic masturbation (i.e., whether defined by masturbating more than one desired or not, experiencing sexual distress or not, the masturbation frequency being above average frequency or not) resulted in different proportions of individuals categorized as having problematic masturbation. Moreover, self-perceived problematic masturbation was positively associated with childhood sexual abuse, depression and anxiety symptoms, while negatively associated with sex-positive family background.

Different Assessments of Problematic Masturbation

The prevalences we found were generally within the range of the prevalence rates of compulsive sexual behavior found in previous literature (Coleman, 1992; Kuzma & Black, 2008; Malandain et al., 2020; Odlaug et al., 2013). Yet different assessment criteria seem to categorize different people as having problematic masturbation.

Masturbation Frequency

For both sexes, associations between masturbation frequency below or above average and sexual distress, and between masturbation frequency below or above average and self-perceived problematic masturbation suggest that masturbation frequency below or above average is a strong predictor of whether one experiences sexual distress. It also strongly predicts whether one perceives oneself to be masturbating in a problematic way. As identified by Cantor et al. (2013), one feature of paraphilic hypersexuality is that the client would report extremely high frequencies of one or more sexual behaviors, and it is sufficient to lead to distress. Our findings are in line with this result that frequency is an important dimension in the assessment of problematic masturbation.

The Ability to Control Masturbation

We also found that masturbating more than one desired is associated with a higher level of sexual distress. Masturbating more than one desired suggests poor behavioral control resulting in feelings of concern or anxiety about one's sexuality. However, for both men and women, those who masturbated less than desired also reported experiencing more sexual distress than those who masturbated as they desired. For women, those who masturbated less than desired actually experienced even more sexual distress than those who masturbated more than desired. It seems important that one's sexual practices match with one's desire since the balance is related to better sexual mental health by and large.

The Severity of Related Distress

Gender as a Predictor of Sexual Distress: Consistent with previous literature, women in our study reported a lower masturbation frequency compared with men (Das, 2007; Das et al., 2009; Gerressu et al., 2008). However, women experienced more sexual distress. Significant associations between gender and self-perceived problematic masturbation, between gender and those who masturbated less than average but still experienced sexual distress, and between gender and those who masturbate less than average but still had self-perceived problematic masturbation, all suggest that women are more likely to experience more sexual distress. This means that the exact masturbation frequency may not play a decisive role. Instead, how people perceive their masturbation frequency is central. As demonstrated in previous research, masturbation remains highly stigmatized (Coleman, 2003; Hogarth & Ingham, 2009; Kaestle & Allen, 2011; Shibley Hyde & Jaffee, 2000). College students widely indicated shame, awkwardness, and guilt associated with masturbation (Kaestle & Allen, 2011). Particularly, studies showed

Table 6 Correlations between masturbation frequency, desired masturbation frequency, gap between actual and desired masturbation frequency, sexual distress, sexual abuse history, sex-positive family background, depression, and anxiety for men (in the below diagonal, n = 4322) and women (in the above diagonal, n = 7949)

Men\women	MFre[a]	DMFre[b]	Gap[c]	SDS[d]	SfPPM[e]	SexAbu[f]	SPFB[g]	Depre[h]	Anxi[i]
MFre	1	.835**	− .237**	.119**	.069**	.046**	.028	.161**	.114**
DMFre	.766**	1	.336**	.138**	.056**	.045**	.040*	.155**	.118**
Gap	− .257**	.424**	1	.038*	− .022	− .001	.021	− .003	.016
SDS	.238**	.092**	− .201**	1	.759**	.092**	− .164**	.399**	.329**
SfPPM	.181**	.009	− .242**	.791**	1	.089**	− .129**	.311**	.259**
SexAbu	.013	.006	− .011	.080**	.082**	1	− .095**	.104**	.109**
SPFB	.069**	.106**	.056*	− .112**	− .092**	− .067**	1	− .175**	− .143**
Depre	.208**	.126**	− .099**	.474**	.385**	.112**	− .171**	1	.722**
Anxi	.114**	.057**	− .069**	.384**	.316**	.121**	− .122**	.705**	1

**Correlation is significant at the 0.01 level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

[a]MFre: The frequency of masturbation. The higher the number is, the more frequent the masturbation

[b]DMFre: The desired frequency of masturbation. The higherthe number is, the more frequent one wishes to masturbate

[c]Gap: The value of desired masturbation frequency subtracts masturbation frequency (i.e. Gap between Actual and Desired Masturbation Frequency). If the value is below zero, it suggests that one masturbates more than one desires, and the lower the number is, the larger discrepancy it implies. If the value is above zero, it suggests that one masturbates less than one desires, and the higher the number is, the larger discrepancy it implies

[d]SDS: The summary variable of the Sexual Distress Scale. The higher the number is, the more sexual distress one has experienced in the past 30 days

[e]SfPPM: Self-Perceived Problematic Masturbation, defined by Masturbation Frequency More Than Desired Dichotomous plus those who scared one Standard Deviation above the Mean in Sexual Distress Scale. The value 0 suggests that one masturbates as frequent as one desires and does not experience sexual distress; the value 1 suggests that one masturbates more than one desires and does not experience sexual distress; the value 10 suggests that one masturbates as frequent as one desires, and experiences sexual distress; the value 11 suggests that one masturbates more than one desires, and experiences sexual distress

[f]SexAbu: The question about childhood sexual abuse "I believe that I was sexually abused" in Childhood Trauma Questionnaire. The higher the number is, the more frequent one believes that one was sexually abused

[g]SPFB: Sex-Positive Family Background–the summary variable of Parental Attitudes Items in Sexual History and Adjustment Questionnaire. The higher the number is, the more positive parental attitudes towards sexuality one experienced during childhood (before the age of 16)

[h]Depre: The subcategory of Depression in Brief Symptom Inventory. The higher the number is, the more severe depression symptoms one shows in the past seven days

[i]Anxi: The subcategory of Anxiety in Brief Symptom Inventory. The higher the number is, the more severe anxiety symptoms one shows in the past seven days

that attitudes towards masturbation are more prohibitory among women than men, which means that women commonly reported more internalized guilt and negative feelings about masturbation (Fahs & Frank, 2014; Fahs & Swank, 2013; Kaestle & Allen, 2011). Women may be socialized in a way that they generally feel distressed about their sexuality, regardless of the frequencies of sexual activities. As such, distress associated with masturbation may be primarily a maladaptation in the thinking process.

Psychological Interpretation as a Predictor of Sexual Distress*:* Importantly, among those masturbating more than once per day, only 28.9% of men and 20.1% of women experienced sexual distress, whereas some participants whose masturbation frequency was less than average still reported self-perceived problematic masturbation. This suggests that the psychological interpretation of people's masturbation behavior is essential. Some people masturbate often but do not regard this as problematic. On the other hand, some do not necessarily have a high masturbation frequency, but they may consider themselves masturbating too much and thus fall in the problematic masturbation category. Similar cases were reported in Cantor et al. (2013) study in that clients categorized into the "sexual guilt" type present self-labels of hypersexuality but lack any overt behavioral extremes. In fact, their frequencies of sexual behaviors are within group norms around their age (Cantor et al., 2013). In this situation, self-reported sexual distress should be taken into consideration in the assessment since the thinking process towards each individual's behavior matters in affecting their mental health. More importantly, evaluating both the reported distress and frequency is essential.

Furthermore, Cantor et al. (2013) also suggested the existence of "the designated patient," meaning that referrals are instigated not by the client, but by the client's romantic

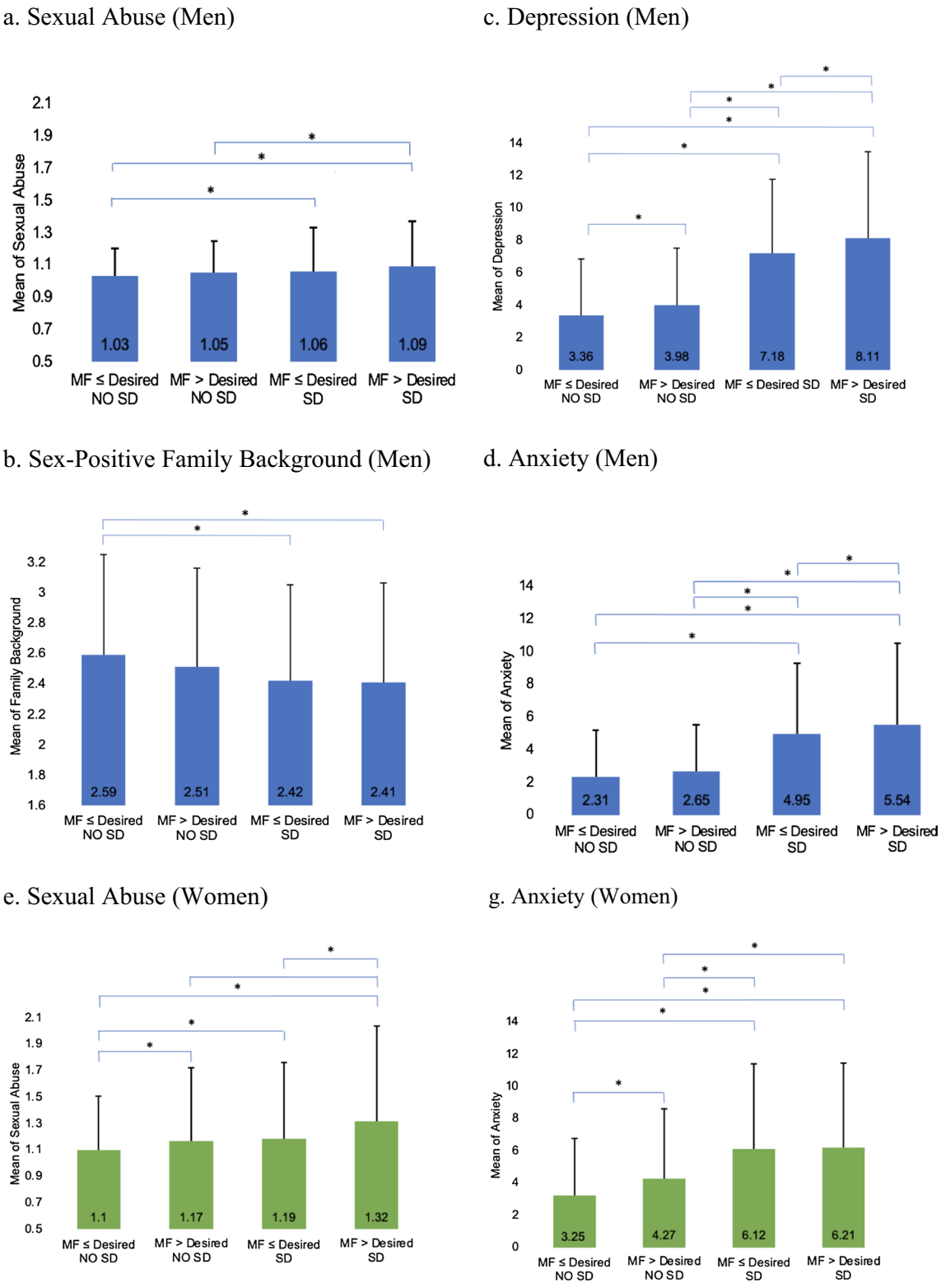

Fig. 2 Mean of related factors among men and women in different subgroups of self-perceived problematic masturbation. *Note*: "MF ≤ Desired No SD" refers to masturbation frequency as or less than desired and has no sexual distress. "MF > Desired NO SD" refers to masturbation frequency more than desired and has no sexual distress. "MF ≤ Desired SD" refers to masturbation frequency as or less than desired and has sexual distress. "MF > Desired SD" refers to masturbation frequency more than desired and has sexual distress.*Indicated that there was a significant difference between two groups

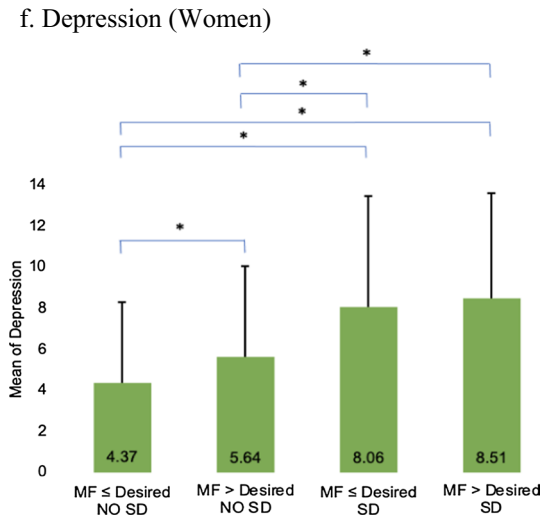

Fig. 2 (continued)

partner. In our study, although we did not measure if the participants' self-perception of problematic masturbation was initiated by themselves or not, it is possible that some participants heard complaints from their partners and thereafter felt concerned about their sexual behavior. An underlying message may be that their partner was expressing frustration that they were unhappy with their sex life and felt disturbed when realizing that those clients would rather masturbate themselves than have sex with them. When assessing problematic masturbation, it is also paramount to ask about the origins of the related sexual distress and figure out if there are external influential factors that prompt clients to seek treatment.

Above all, as Cantor et al. (2013) synthesizes the typology, "no single model applies to all clients presenting with or complaining of hypersexuality" (p. 884). Different assessment criteria presented in our study open room for a more in-depth discussion about how to understand and diagnose problematic masturbation.

Etiology

Childhood Trauma

Our results showed that childhood trauma was associated with self-perceived problematic masturbation in adulthood. Traumatic childhood experience is known to be related to problems in relationships, emotions, and behaviors in adulthood (Diehl et al., 2019; Kizilok, 2021). Childhood sexual abuse may be especially relevant for compulsive sexual activities since survivors may indulge themselves in frequent sex as a way of coping with traumatic memories (Giugliano, 2006; Gold & Heffner, 1998; Hall, 2011; Krupnick & Horowitz, 1981). In contrast, growing up in a sex-positive family background is likely to be beneficial because if parents feel uncomfortable talking about sex or respond negatively to adolescent masturbation, this may contribute to misunderstanding of masturbation and make it a major source of sexual distress (Coleman, 2003; Gagnon, 1985; Kaestle & Allen, 2011). In sum, negative sex-related experiences at an early age are likely to contribute to negative interpretations of masturbatory behavior at later stages.

Depression and Anxiety Symptoms

Associations between self-perceived problematic masturbation and depression and anxiety symptoms indicate that problematic masturbation may be related to the mood states of individuals. One possible explanation is that depressed or stressed individuals are more likely to experience distress in various aspects of life, and this may include distress about their sexuality. Or it may be that they are anxious about other areas in life, and that excessive masturbation is

Table 7 Means, standard deviations, and generalized estimating equations statistics for men and women whose masturbation frequency was below average

Variable	SPPM$_a$			NO SPPM			*GEE*		
	M	*SD*	*n*	*M*	*SD*	*n*	Wald χ^2	*df*	*p*
a. Men									
Sexual abuse	1.08	0.27	58	1.03	0.18	1282	1.52	1	.218
Sex-positive family background	2.28	0.61	1302	2.51	0.64	60	8.34	1	.004
Depression	8.03	6.24	1289	3.24	3.51	60	35.40	1	<.001
Anxiety	1.24	5.54	1291	1.1	2.91	60	22.40	1	<.001
b. Women									
Sexual abuse	1.22	0.61	33	1.11	0.44	2890	1.13	1	.288
Sex-positive family background	2.19	0.63	34	2.49	0.69	2935	7.69	1	.006
Depression	8.18	5.26	34	4.56	4.2	2891	17.16	1	<.001
Anxiety	5.56	4.47	34	3.55	3.86	2885	6.82	1	.009

a. SPPM: Self-Perceived Problematic Masturbation, defined by Gap between Actual and Desired Masturbation Frequency plus those who scored one Standard Deviation above the Mean in Sexual Distress Scale

a coping mechanism for them to deal with stress or negative life events. For instance, people with compulsive sexual behavior may have mood regulation issues that masturbation is a method to escape from bad feelings. Likewise, as Cantor et al. (2013) notices, avoidant masturbators reported feelings of anxiety or dysthymia. Some found masturbation could soothe such negative emotions, whereas some reported that masturbation could result in anxiety or depression (Cantor et al., 2013). Thus, it is also important to check clients' mood regulation and general mental health status, recognizing other stressors that cause sexual distress and self-perceived problematic masturbation.

Looking particularly into those who masturbated below average, related factors were also associated with negative impacts. The environment one grows up in is likely to have a fundamental influence on one's perspective toward sexuality. In this case, while the masturbation frequency is in fact less than average frequency, but self-perceiving having problematic masturbation, a crucial contributing factor is that the environment at an early age may not contribute to accepting one's sexual desire, interest, or previous sexual experiences. Indeed, as Mark and Haus (2019) acknowledge, one's culture has a large impact on one's development of healthy sexuality. In clinical practice, it is important to carefully explore the causes of one's compulsive sexual behavior. Different causes may provide insights for therapists to determine whether the problematic behavior has more to do with the absolute frequency, which may include the use of medications or interventions to reduce the excessive behavior. Or the problematic behavior is more self-perceived that does not include a high frequency but is accompanied by high distress. In this case, treatment has to work on adjusting the thinking process, making peace with oneself, and ultimately reducing sexual distress.

Strengths, Limitations, and Future Research

This study has several strengths. First, our study has a large sample size that was representative of the general Finnish population. Second, we had measures for participants' masturbation frequency, desired masturbation frequency, sexual distress, childhood trauma, depression, and anxiety symptoms. When possible, we used the latest scales with established reliability and validity (Derogatis & Melisaratos, 1979; Conoley & Kramer, 1989; Derogatis, 1993; Derogatis et al., 2002; Bernstein et al., 2003; Fisher et al., 2013Carpenter et al., 2015). Third, our findings have important implications for the debate about diagnosing compulsive sexual behavior and for treatment approaches. While Cantor et al. (2013) presents specific cases for clients who seek treatment, we employed a different approach by using a large dataset but came to similar results.

Nevertheless, the study has a few limitations. First, masturbatory behavior was only measured by the actual frequency and desired frequency of masturbation. We did not ask about participants' exact practices during their masturbation, so whether idiosyncratic techniques in masturbation influence problematic masturbation was unknown. For instance, viewing pornography while masturbating may make a difference as the background literature suggests that excessive consumption of pornography may be a risk factor for developing sex addiction, including problematic masturbation (Cantor et al., 2013). Higher pornography use is also associated with more frequent masturbation (Fischer & Træen, 2022). Specifically, if pornography use is not consistent with one's moral beliefs, it is likely to be associated with greater psychological distress and self-perceived problems around pornography use (Grubbs & Perry, 2019).

Besides, the Sexual Distress Scale targeted the participant's general distress and anxiety of sexuality, instead of specifically focusing on the distress associated with masturbation. Future research should investigate the impact of specific masturbation behaviors and the relation to the use of pornography and associated distress, rather than only measuring frequency and distress in general. Additionally, as Buaban (2021) and Bullough (2003) claim, religious beliefs are a common moderator of sexual attitudes and behaviors. In the current study, we did not include measures about religious background, which should be covered in future studies. In the third place, data of the current sample was collected more than a decade ago. People's attitudes towards sex and sexual practices may have changed and new data collection is in need. Lastly, the study did not include interventions and the etiology analyses were based on correlations between variables. Therefore, no conclusions can be made for causations, which means that the detailed causes of self-perceived problematic masturbation require further longitudinal studies on the same participants over years. Causational studies are of vital importance because this field is understudied. Further findings of etiology could provide more insights for clinical treatment.

Conclusion

Due to the stigma and misunderstandings, masturbation may have the potential to elicit overwhelming guilt and pressure in individuals. Our results indicate that self-perceived problematic masturbation may come from masturbating more than one desires, high masturbation frequency, and merely experiencing significant distress about one's sexuality regardless of actual masturbation frequency. Further, self-perceived problematic masturbation is related to childhood trauma (i.e., childhood sexual abuse and/or sex-negative family background), depression and anxiety symptoms. Future research

concerning idiosyncratic masturbation, use of pornography, and causational studies are warranted.

Author's Contribution Conceptualization: SH, PS; Methodology: PS; Planning and completing original data collections: PS, PJ; Formal analysis and investigation: SH, PS; Writing—original draft preparation: SH; Writing—review and editing: TN, PJ, PS; Funding acquisition: PJ, PS; Resources: PJ, PS; Supervision: TN, PS.

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Declarations

Conflict of interest The authors declare no conflict of interest.

Ethical Approval Research plans for data collections were conducted in accordance with the Declaration of Helsinki and were approved by the Departmental or University level Research Ethics Committees at Åbo Akademi University, as appropriate.

Informed Consent Informed consent was obtained from all the participants involved in the study.

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