

The influence of masturbation experience on women's sexual satisfaction in a German sample

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Abstract

This online-based study examines individual aspects of female masturbation, the links to individual sex variables, and the influences on women's sexual satisfaction and life satisfaction. Significant correlations of masturbation frequency, age of first masturbation, and orgasmic ability during masturbation were found. It appears that satisfaction with one's own masturbation experiences, as an overarching variable of masturbation, is related to sexual satisfaction and to life satisfaction. Correlations of the individual sex variables to the overall sexual satisfaction are shown. The individual preferences of masturbation can be transferred to sexual activity with a partner and could therefore increase overall sexual satisfaction.

Introduction

Masturbation is a common and widespread sexual practice, which today is described as "an independent form of sexuality that occurs independently of the presence of a partnership or sexual contacts" [1]. Sexual self-stimulation has been, and to some extent still is, a highly debated and controversial topic in human sexuality [2]. Masturbation has been marked by a long-lasting and inglorious history [3]. Today, remnants of the old stigma of doing something shameful and bad still exist [4]. Furthermore, these stigmas are sometimes accompanied by attributions such as being sexually unsuccessful or unrestrained [1]. A de-tabooing of sexual masturbation has led to a positive and appreciative view of masturbation in sexually liberal countries. However, it is still not taken for granted in all social groups, cultures, and religions [5,2]. Research examining women's sexual pleasure remains rare, although there has been growing evidence in recent years that masturbation has a positive impact on sexual health [2]. Getting to know one's own body and sexuality can be seen as a prerequisite for later sexual satisfaction [6]. Nevertheless, clear gender differences emerge in experiences with masturbation emerge [7,5,3].

Female masturbation behavior has changed significantly in recent decades. A study with West German students conducted in 1966 (N= 3666) and replicated in 1981 (N= 1922) found that female masturbation increased significantly. At age 20, 46% of women admitted to masturbation in 1966, whereas in 1981, 73% of women admitted to masturbate. No such extreme

Received: Jan 01, 2024

Accepted: Feb 01, 2024

Published Online: Feb 08, 2024

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Keywords: Masturbation; Self-Satisfaction; Female; Sexual Satisfaction; Orgasm.

Cite this article: Kasten E, The influence of masturbation experience on women's sexual satisfaction in a German sample. *J Clin Med Images Case Rep.* 2024; 4(1): 1623.

difference was seen among men (1966; 89% of men, 1981; 92%) [7]. In addition, women's masturbatory behavior doubled before their first sexual intercourse (from 32% in 1966 to 63% in 1981) [7]. Current findings indicate that 94.5% of women have masturbated at least once in their lifetime, with 63.1% of women self-pleasuring at least once a week or more [2].

For females, in particular, masturbation seems to be associated with the onset of sexual contact in early adolescence [1]. A German study on youth sexuality describes that many young girls have their first sexual experiences not with themselves but in interaction with a partner, and even the stimulus for masturbation in some girls comes first from their partner [3]. The frequency and positive attitudes toward masturbation are also significantly lower among girls than among boys [3]. Females who masturbate in adolescence reported having more frequent orgasms during sexual intercourse and tended to have lower sexual arousal difficulties [8].

Older women report fewer orgasm problems and greater satisfaction with their orgasm, while also reporting lower satisfaction with their overall sex life [2]. High frequency of masturbation appears to be associated with positive attitudes toward sexuality, positive body self-image, generally higher sexual activity, and a greater ability to fantasize sexually [1]. Masturbation is associated with a women's ability to orgasm, healthy sexual function, and greater sexual satisfaction within a partnership [9].

The impact of the experience of female masturbation

on sexuality in a relationship has hardly been researched yet [1]. Whether and to what extent relationship status and masturbation are related could only be shown occasionally and often not without contradictions. One study shows that women who do not have a relationship or sex masturbate more [10]. According to another study, in women, the frequency of masturbation is independent of the presence of a sexual partner [11]. Show that among individuals in long-term relationships [5], sexual intercourse becomes less frequent, but the frequency of masturbation remains stable over time. In contrast, describe that longer relationships are associated with a lower frequency of masturbation [8]. According to, for many women, masturbation is not a substitute for a partner [2], but an additional way to achieve sexual pleasure, as well as a strategy for relaxation and stress management.

Studies in western societies illustrate that masturbation, especially in younger generations, is practised by men and women for their own sake [6] and tends not to be seen as suboptimal compensation for lack of a sexual partner [10]. In general, for both sexes, the absence of emotional fulfilment, both within and outside of a committed sexual partnership, has been shown to lead to more masturbation [10]. Whereas intimacy in a relationship has a positive effect on the probability of orgasm and sexual satisfaction [12]. Relationship satisfaction and marital satisfaction also positively affect sexual satisfaction [13]. 69.4% of 765 American women felt that masturbation improved their pleasure in sexual encounters [14]. In addition, women who masturbate state that they feel more comfortable talking about sex with their partners [15]. It has been repeatedly confirmed that women are much more likely to experience orgasm during masturbation than during sexual intercourse [15,16,17].

Nevertheless, satisfaction from masturbation is generally lower than satisfaction from partnered sex [17]. It is suggested that women value the nature of orgasms differently, and for satisfaction, orgasm achieved through penetration appears to be very significant despite the fact that this may be achieved by only a few women [18]. Studies often cite the need for clitoral stimulation to achieve orgasm [19]. Masturbation during sexual intercourse offers one possible combination: Clitoral stimulation during penetration by the woman herself or by her partner is more likely to result in orgasm, although this is practiced by only a tiny proportion of women surveyed [18].

Masturbation appears to be related to various positive factors, leading to the assumption that it also has positive aspects for sexual health [1,8]. A healthy sexual life for young adults allows for a complete understanding of sexual orientation, sexual preferences, and thus leads to intimate and mature relationships [20]. It can be assumed that greater sexual activity and the masturbatory behavior, have an impact on sexual well-being [21]. Women's sexual satisfaction certainly significantly impacts life satisfaction and general well-being [22-24]. How individual aspects of sex and masturbatory activity impact sexual satisfaction and life satisfaction remains an open question to date [1,25].

There is currently an enormous deficit in sexuality-related teaching and research in the human and social sciences [26]. For example, to date, sex education curricula, in addition to education about the female cycle or contraception, have not included a particular focus on sexual well-being and, by extension, masturbation in young girls [3,14]. In addition, sexual

experience and behavior are not widely addressed in most curricula at universities, colleges, and even psychotherapeutic or counseling training programs today [26]. Although there are many clinical studies on sexual dysfunction, these have done little to improve understanding of the mechanisms and outcomes of everyday sexual interactions or sexual satisfaction in women [23]. To date, few studies have examined aspects of human masturbatory behavior and sexual pleasure in women; this deficiency continues to allow for the possibility of controversy and misunderstanding [2]. Moreover, many studies examining masturbatory behavior often only measure the frequency, which might not be an appropriate and sufficient metric [1]. The rarity of psychological studies and the diversity of existing research findings, makes it challenging to provide a more precise overview for a current understanding of women's masturbation.

This paper aims to examine individual aspects of masturbation and their relationship to women's sexual satisfaction. Masturbation aspects in this study include the factors: masturbation frequency, orgasmic ability during masturbation, age of first masturbation, and masturbation satisfaction. Similar variables are additionally collected regarding partnered sexuality. It is assumed that early masturbation experiences in young women create a distinct exploration of their own bodies and sexuality. This allows exploration and practice of sexual preferences and the body's sexual responses, such as the experience of orgasm. This acquired knowledge could positively impact satisfying needs later, with or without a partner, and could increase women's overall sexual satisfaction and general satisfaction with life. Negative correlations are expected between the age of first masturbation experience and satisfaction with one's masturbation and sexual satisfaction. In addition, positive correlations between the frequency of masturbation or intercourse, and the ability to orgasm during masturbation or partnered sex with sexual satisfaction are each expected. Furthermore, positive associations are expected between masturbation satisfaction, sexual satisfaction, and life satisfaction.

Materials and methods

An online questionnaire was created and submitted exclusively to women of legal age to measure female sexuality for this study. Participants were acquired through forums, social networks, and Sona (the proprietary test person system for students of the Hamburg Medical School, Germany). The questionnaire for data collection was provided via the Unipark questback EFS 2019 software during a period from 01.04.2020 to 01.06.2020. The participation in the survey was voluntary; there were no financial incentives.

Questionnaire: In addition to sociodemographic characteristics, information was collected on individual aspects of masturbation and sexuality experiences. The constructs of sexual satisfaction and life satisfaction were collected using German versions of validated scales (New Sexual Satisfaction Scale (NSSS-SD) and the Satisfaction with Life Scale (SWLS)). Items that capture sociodemographic variables such as age, level of education, and gender were included to retrospectively filter out non-conforming male subjects. Questions on sexuality include sexual orientation, sexual relationship status (current presence of a sexual partner), age of first sexual intercourse, the average estimated frequency of sex in a four-week period, personal evaluation of the above mentioned frequency (whether it is

perceived as much/less), and orgasmic ability during sex.

Items were also created to examine various aspects of masturbation. At first, the question here was whether there had been a masturbation experience so far. If the answer was positive, the participants received additional items about their masturbation experience. These included the age of the first masturbation, the average frequency of masturbation in a period of four weeks, the personal rating regarding the previously mentioned amount for masturbation frequency, the orgasmic ability during masturbation, and finally, the general satisfaction with one's own masturbation, which will be described as the variable of masturbation satisfaction in this article.

The German short version of the New Sexual Satisfaction Scale (NSSS-SD) [13] was used to collect an individual score on general sexual satisfaction of participating women. The scale normalization was recently verified with a representative sample of N=2524, the internal consistency is

$$\alpha = .96 [13],$$

and with only 12 items, it forms an economic measuring instrument for sexual satisfaction. Here, the NSSS-SD captures both self-related items ("How satisfied are you with your sexual body responses?") and partner-related questions ("How satisfied are you with your partner's sexual creativity?"). In the original German version, the item's wording makes no distinction between a male partner and a female partner. For this study, the individual items were modified so that homosexual women also felt addressed. The response categories include a five-point Likert scale with gradations from "very satisfied" to "not at all satisfied." The German version of the Satisfaction with Life Scale (SWLS) captures general life satisfaction with its five items. For the German version, there is an internal consistency of

$$\alpha = .92[27].$$

The response categories are scaled from "strongly disagree" to "strongly agree" using a seven-point Likert scale. However, for this work, the order of the response categories was reversed to align from low to high with the NSSS. This creates a format of the online questionnaire that is more uniformly structured for participants. A high score corresponds to high overall life satisfaction.

Statistical analyses: Data were analysed using IBM; SPSS Statistics versions 25 and 27. First, reliability was tested for the NSSS (= .898) and SWLS (= .833) scales, which indicated high internal consistency and were thus found to be appropriate. The sexual satisfaction questionnaire (NSSS-SD) and the life satisfaction questionnaire (SWLS) were evaluated using the summed total score. According to the measuring instrument, the higher the value, the higher the respective satisfaction. As an additional prerequisite for further calculations, the variables were examined with regard to the normal distribution. The distribution of the variables NSSS and SWLS was right-skewed. However, due to the central limit theorem, a normal distribution can be assumed for the sample size, as N=244 women. To view the sample descriptively, frequencies, means, standard deviation, and range were calculated. Since some variables are ordinally scaled (e.g., masturbation-orgasm frequency) and/or have outliers (e.g., masturbation frequency), the previously postulated correlations are calculated uniformly.

Using the Spearman rank correlation coefficient. Only

the correlation between sexual satisfaction (NSSS) and life satisfaction (SWLS) is additionally determined with a Pearson correlation.

Results

Sample description: The total sample includes 244 women aged 18-58 years, with an average age of 24.26 years (SD= 6.198). Almost all the women interviewed had at least a (technical) high school diploma (99.7%, n=243), which means that the educational level of the sample group can be considered high. 88.5% of the interviewees indicated their sexual orientation as heterosexual. The question about the status of the sexual relationship was not about indicating a steady partnership, but about sexual relationships. This includes, for example, friends with benefits, open relationships, love affairs, etc. Overall, 76.3% of the women had a sexual partner at the time of the survey. (Table 1) shows a detailed description of other sample characteristics. (Figure 1) shows the age at the first sexual interaction compared to the age at first masturbation experience. The age range for the first masturbation experience is much more comprehensive (range: 5 - 45 years) than for the first sexual intercourse (range: 13 - 26 years). Only four women reported never having masturbated in their lives. Those who had sexually self-pleasured at least once were asked about their satisfaction with their masturbation. The majority of participants (n=192, 78.8%) reported being satisfied with their masturbation (often; always). The response distribution for masturbation satisfaction is plotted in (Table 2).

When asked about the average number of times they have sex and masturbate in an average four-week period, women indicated a higher average value for sex (M:7.58; SD:7.656), compared to masturbation (M:6.62; SD: 6.825). After stating how often they have sex or masturbate on average in four weeks, they

Table 1: Sociodemographic variables

	M	SD	MOD	Min	Max
NSSS	46.83	8.07	48	14	60
SWLS	26.51	4.82	30	5	35

Annotation: NSSS: New Sexual Satisfaction Scale (Range-Potential: 12-60); SWLS: Satisfaction with Life Scale (Range-Potential: 5-35); MOD: Modal value; Min: Minimum, Max: Maximum.

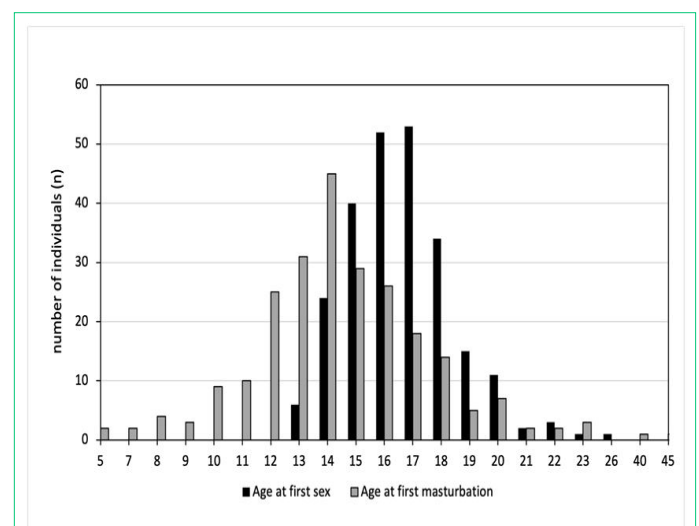


Figure 1: Distribution of age frequencies between first sex and first masturbation.

Table 2: Frequencies of the NSSS and the SWLS.

	M	SD	MOD	Min	Max
NSSS	46.83	8.07	48	14	60
SWLS	26.51	4.82	30	5	35

Annotation: NSSS: New Sexual Satisfaction Scale (Range-Potential: 12-60); SWLS: Satisfaction With Life Scale (Range-Potential: 5-35); MOD: Modal value; Min: Minimum; Max: Maximum.

Table 3: Response distribution of masturbation satisfaction.

"How satisfied are you with your masturbation?"	n	%
Never satisfied	3	1.2
Rarely satisfied	4	1.6
Sometimes	41	16.8
Often satisfied	105	43.0
Always satisfied	87	35.7
Missing specification (never masturbated before)	4	1.6

Table 4: Subjective assessment of the frequencies of sex and masturbation.

"How often/rarely do you perceive the value above to be?"	Sex n (%)	Masturbation n (%)
Very rare	40 (16.4)	39 (16.0)
Rarely	41 (17.2)	46 (18.9)
Occasionally/sometimes	91 (37.3)	103 (42.2)
Frequently	63 (25.8)	43 (17.6)
Very often	8 (3.3)	9 (3.7)

Table 5: Orgasm ability during sex and masturbation.

"How easily do you achieve orgasm during sex/masturbation?"	Sex n (%)	Masturbation n (%)
I have an orgasm 0-25% of the time	68 (27.9)	13 (5.3)
I have an orgasm 25-50% of the time	55 (22.5)	15 (6.1)
I have an orgasm 50-75% of the time	57 (23.4)	21 (8.6)
I have an orgasm 75-100% of the time	64 (26.2)	191 (78.3)
Missing value because never experienced	0	4

Table 6: Response distribution of the items of the NSSS-SD.

"How satisfied are you with ...?"	Not at all Satisfied n (%)	A little Satisfied n (%)	Moderately Satisfied n (%)	Very Satisfied n (%)	Extremely Satisfied n (%)
... the quality of your orgasms	12 (4.9%)	23 (9.4%)	33 (13.5%)	109 (44.7%)	66 (27.0%)
... your "letting go" and surrender to sexual pleasure during sex	4 (1.6%)	15 (6.1%)	51 (20.9%)	119 (48.8%)	54 (22.1%)
... the way you sexually react to your partner	4 (1.6%)	12 (4.9%)	34 (13.9%)	112 (45.9%)	81 (33.2%)
... your body's sexual functioning	4 (1.6%)	20 (8.2%)	39 (16.0%)	117 (48.0%)	63 (25.8%)
... your mood after sexual activity	4 (1.6%)	10 (4.1%)	36 (14.8%)	94 (38.5%)	97 (39.8%)
... the pleasure you provide to your partner	3 (1.2%)	8 (3.3%)	17 (7.0%)	94 (38.5%)	121 (49.6%)
... the balance between what you give and what you receive in sex	9 (3.7%)	15 (6.1%)	37 (15.2%)	103 (42.2%)	78 (32.0%)
... your partner's emotional opening up during sex	6 (2.5%)	19 (7.8%)	42 (17.2%)	78 (32.0%)	98 (40.2%)
... your partner's ability to orgasm	5 (2.0%)	6 (2.5%)	22 (9.0%)	75 (30.7%)	135 (55.3%)
... your partner's sexual creativity	7 (2.9%)	23 (9.4%)	68 (27.9%)	86 (35.2%)	58 (23.8%)
... the variety of your sexual activities	6 (2.5%)	28 (11.5%)	73 (29.9%)	90 (36.9%)	46 (18.9%)
... the frequency of your sexual activity	23 (9.4%)	42 (17.2%)	60 (24.6%)	67 (27.5%)	52 (21.3%)

were also asked if they perceived the previously stated values as frequent. In response to this question similar characteristics were identified, which are shown in (Table 3). Table 4 shows the orgasm ability during sex and during masturbation. Here, a clear difference can be seen. 78.3% of women state they have an orgasm very often during masturbation, in fact 75-100% of the time. During sex, only 26.2% of women reach a sexual climax so frequently. Sexual satisfaction was measured using the NSSS-SD, and life satisfaction was measured using the SWLS. Table 5 shows the mean values of sexual satisfaction (M:46.66) and life satisfaction (M:26.51). Here, it can be seen that, on average,

the women surveyed reported 72.56% for the NSSS and 70.7% for the SWLS in terms of the possible range. Additionally, the response allocations of individual items from the NSSS-SD and SWLS are shown in Table 6 and 7.

Results of correlating variables of masturbation

To display all correlations between individual masturbation and partnered sex variables, as well as sexual satisfaction and life satisfaction, a Spearman rank correlation matrix was created. This can be seen in (Table 8).

First, a negative correlation shows a small effect between age

Table 7: Response distribution of the items of the SWLS.

	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
In most ways my life is close to my ideal.							
n (%)	2 (0.8%)	6 (2.5%)	14 (5.7%)	40 (16.4%)	69 (28.3%)	94 (38.5%)	19 (7.8%)
The conditions of my life are excellent."							
n (%)	1 (0.4%)	2 (0.8%)	5 (2.0%)	27 (11.1%)	66 (27.0%)	91 (37.3%)	51 (20.9%)
I am satisfied with my life."							
n (%)	2 (0.8%)	1 (0.4%)	7 (2.9%)	26 (10.7%)	51 (20.9%)	115 (47.1%)	41 (16.8%)
So far I have gotten the important things I want in life."							
n (%)	1 (0.4%)	4 (1.6%)	15 (6.1%)	45 (18.4%)	45 (18.4%)	92 (37.7%)	42 (17.2%)
If I could live my life over, I would change almost nothing."							
n (%)	7 (2.9%)	12 (4.9%)	16 (6.6%)	62 (25.4%)	50 (20.5%)	71 (29.1%)	26 (10.7%)

Table 8: Rank correlation matrix according to Spearman.

	A	MA	SA	MO	SO	MF	SF	MS	NSSS	SWLS
A	1									
MA	.027	1								
SA	-.020	.090	1							
MO	.114	-.199**	-.102	1						
SO	.084	-.012	-.008	.139*	1					
MF	-.161*	-.315**	-.093	.185**	-.187**	1				
SF	-.052	-.079	-.112	.064	.243**	-.052	1			
MS	.164*	-.191**	-.101	.528**	.039	.267**	.002	1		
NSSS	-.039	.016	.058	.070	.376**	-.119	.476**	.140*	1	
SWLS	-.067	-.044	.009	.029	.086	-.091	.110	.131*	.230**	1

Annotation: Two-sided testing, * $p < .05$, ** $p < .01$; A: Age, MA: Masturbation-Age, SA: Sex-Age, MO: Masturbation-Orgasm-Ability SO: Sex-Orgasm-Ability, MF: Masturbation-Frequency, SF: Sex-Frequency, MZ: Masturbation-Satisfaction, NSSS: New Sexual Satisfaction Scale, SWLS: Satisfaction With Life Scale.

and masturbation frequency ($r_s: -.161, p < .05$). The younger the women in this sample, the more frequently they masturbate. The age of the first experience of masturbation is negatively related to orgasmic ability during masturbation ($r_s: -.199, p < .01$). Furthermore, there is a negative correlation of the mean effect between masturbation age and masturbation frequency ($r_s: -.315, p < .01$). The older the test subjects were at their first masturbation, the less frequently they satisfied themselves in a four-week period at the time of the questionnaire, and the less frequently they had an orgasm during masturbation. Furthermore, there is a positive association ($r_s: .139, p < .05$) between the frequency of having an orgasm during masturbation and having an orgasm during sex. Women who more often have an orgasm during masturbation also have an orgasm during sex. Furthermore, a positive correlation ($r_s: .185, p < .01$) is shown between the ability to have an orgasm during masturbation and the frequency of masturbation. The more frequently women have an orgasm during masturbation, the more frequently they masturbate.

The frequency of orgasm during sex has a negative effect ($r_s: -.187, p < .01$) on the frequency of masturbation on the one hand and a positive effect ($r_s: .243, p < .01$) on the frequency of sex on the other. The more often women have an orgasm during

sex, the less frequently they satisfy themselves or the higher the average frequency of sexual intercourse within a period is. Furthermore, the ability to orgasm during sex shows a positive correlation ($r_s: .376, p < .01$) with sexual satisfaction. The more often women in this survey achieve orgasm during sex, the more satisfied they are with their sexuality. However, the average frequency of sex also describes a positive correlation ($r_s: .476, p < .01$) regarding sexual satisfaction. Women who report a higher incidence of sexual intercourse in an average period of four weeks also have higher scores in their sexual satisfaction. Masturbation satisfaction establishes significant associations with numerous other variables. First, small effects are observed for age ($r_s: .164, p < .05$) and age of the first masturbation ($r_s: -.191, p < .01$). The older the subjects were at the time of the interview, or the younger they were when they first masturbated, the more satisfied they were with their masturbation. A correlation with a large effect ($r_s: .528, p < .01$) presents itself between orgasmic ability during masturbation and masturbation satisfaction. A correlation ($r_s: .267, p < .01$) between masturbation frequency and masturbation satisfaction is also evident. Furthermore, a correlation of masturbation satisfaction with general sexual satisfaction ($r_s: .140, p < .05$) and life satisfaction ($r_s: .131, p < .05$) is evident. Overall life satisfaction and sexual satisfaction correlate positively with

each other according to Spearman ($r_s: .230, p < .05$), confirming the result of the Pearson's correlation ($r: .237, p < .005$). The more the interviewed women are satisfied with their sexuality, the higher their values regarding their life satisfaction.

Discussion

Discussion of sociodemographic variables: Many women have their first masturbation experiences in adolescence [8]. These results can be confirmed with the present sample. Nevertheless, the range from 5 to 45 years is very broad, although these are only individual people whose statements ensure a broad diversification in this study. For the item "At what age did you consciously sexually self-stimulate for the first time?" two women each stated that they were five and seven years old and only one person each 40 and 45 years old at the time of their first masturbation experience. Although the question was formulated quite specifically, it is necessary to examine what is meant when respondents state that they had their first masturbation experience at the age of five or seven. Is this the first discovery of one's own body, or does it really mean a consciously induced sexual arousal? It is a known fact that an infant begins to explore the world around and its own body. The discovery of certain pleasurable areas can be fascinating and could lead to masturbation. This exploration reaches a peak in overall frequency at the age of five for both girls and boys [28]. However, for future research, these effects could be further clarified.

The age distribution at first sexual intercourse is consistent with results from a German study with female subjects [2]. It should be noted that the age given for the first masturbation experiences or the first sexual intercourse is always retrospective estimates. The interviewed women do not provide exact, objective data but estimate the age for the first experience.

In terms of sexual orientation, a large majority, 88.5%, reported being heterosexual. This data is consistent with [2] study, which was also conducted with a sample of German women. The percentage of women who describe themselves as bisexual (7.8%) is distinctly higher than the percentage of those, describing themselves as homosexual (2%). This also raises the question whether such a categorical classification can still be considered appropriate today. Rather, it can be assumed that the binary system of sexual orientation, between heterosexuality and homosexuality, could be considered outdated and would have to be replaced by a much higher diversity. This is indicated by the statements of a few women who describe themselves as pansexual, bicurious, or heteroflexible.

Furthermore, participating women were asked if they were currently in a sexual relationship. The term sexual relationship was chosen to include all those with an affair, friends with benefits, etc, who would otherwise have reported themselves as single when asked about regular relationship status, even though they currently have a sexual partner. However, it should be noted that the relationship status of a steady relationship is not comparable to an affair or the like, as the confidentiality and intimacy between the partners is likely to constitute a different quality. Aspects of the relationship, such as the duration or number of previous relationships, should be asked in further detail in future studies.

Of the 244 female participants, only four women stated that they had never masturbated in their lives. Thus, 98.4% of the

female subjects had masturbated at least once in their lives. This value is similar to the data (94.4%) from the study by [2]. The majority (78.7%) of the women surveyed are satisfied with their masturbation (often or always). The frequency of masturbation and sexual intercourse refers to an "average period of four weeks". This was chosen to minimize confounding factors, such as the possible influence of a corona-related lockdown or an examination period for students. As a result, the numerical values of the respective frequencies are no concrete indications of the status quo, but rather a general average value for a given period. More women "almost always" experience orgasm during masturbation (78.3%) than during sex (26.2%). This is consistent with the results of a twin study that also found that orgasmic ability is a matter of genetic influence, both during sexual intercourse and during masturbation [16]. Although the women examined reported having orgasms more often during masturbation than during intercourse, they still, on average, practice sex with their partner more often (M: 7.58) than they do self-satisfaction (M: 6.62). The results of a study by [17] also show this phenomenon. One reason could be that women prefer partnered sex over masturbation due to the related intimacy. Subjective assessments regarding their frequency of sex and masturbation are almost congruent. Nevertheless, the individual's subjective appraisal of the frequencies does not provide any information about the satisfaction with the respective frequency of sex or masturbation. That is, a person who states for his or her own perception that he or she has sex relatively infrequently may nevertheless be very satisfied with it. This subjective evaluation was recorded in the questionnaire but was not considered in more detail and could be explored in future studies.

The distribution of sexual satisfaction using the NSSS is left-skewed and thus also corresponds to the sample results in the review of the German version of the questionnaire [13]. The mean scores (M: 46.84) for sexual satisfaction are also similar to those of [13]. This suggests a high level of sexual satisfaction among women. The mean score of the German version of the SWLS [27] was lower than in the present sample (M: 26.50), indicating relatively higher life satisfaction. Many of the participating women have a high level of education and are very young (20 to 30 years). This could positively influence overall life satisfaction and explain the higher values reported.

Discussion of correlated variables of masturbation

First, it was shown that young women masturbate more frequently than older women. This may be due to the fact that younger women are in their sexual exploration phase and thus more often try out sexual arousal and satisfaction with themselves. Temporal and spatial factors could influence the ability to masturbate as a result of current living situations, such as living in a shared apartment and/or caring for young children. Regarding different aspects of masturbation, extremely interesting correlations emerge. Remarkably, significant correlations are shown between all masturbation variables: the age of first masturbation experience, masturbation frequency, orgasmic ability during masturbation, and overall satisfaction with one's masturbation. One suggestion is that having the first masturbation experience at a young age, in other words, women who engage in sexual arousal of their bodies at an early age are more likely to be able to achieve sexual climax during masturbation. [8] also assumed a positive effect of masturbation experiences in adolescence on higher orgasmic ability. However,

masturbation age did not show any association with sex variables (age of first intercourse, sex frequency, and orgasmic ability during sex). For example, a person may experience sexual arousal for the first time through their own stimulation at the age of eight, but then does not follow this up in subsequent years. Thus, whether or not someone was particularly young when they first masturbated does not indicate anything about the intensity or extent of their engagement with their own body's sexual responses. Furthermore, the age collected for the first masturbation in this study is not related to sexual satisfaction (NSSS-SD).

This study showed that women who have an orgasm during masturbation are also more likely to reach a sexual climax during sexual intercourse. This is most likely, because women who know what sexually excites them during masturbation are better able to communicate and implement their needs during partnered sex. Whether and how orgasmic ability during masturbation can be related to orgasmic ability during sexual intercourse has rarely been addressed in the literature and has been interpreted differently by other studies [1,2]. The ability to orgasm during sexual relations shows a positive relationship with the frequency of coitus and a simultaneous reduction in the frequency of masturbation. It can be assumed that those women who are able to orgasm during partnered sex, possibly due to the higher quality of intimacy, accordingly, have sex with a partner more often rather than masturbating. [12] also attribute a significant role in orgasmic ability and sexual satisfaction to the intimacy of the relationship. Orgasmic experience is one aspect of sexual satisfaction [18]. However, orgasmic ability should not be evaluated as a determining criterion when assessing sexual satisfaction. Women report sexual pressure to perform, because there are still sexual myths and sexual stereotypes. For example, one's own idea of how sex with a partner should be or even the expectation of having to have an orgasm during penetration [4,18]. Here, a general reorientation away from orgasm-centered to pleasure-centered sexuality could establish a new view [29]. Future psychosexual education should address this issue to minimize performance pressure and suffering, which can often interfere with the enjoyment of sexual union. The idea that both partners "must" reach sexual climax probably leads to a stress factor that prevents arousal and orgasm precisely at that time.

Age at first coitus does not show any significant correlations with other variables and thus appears to be independent of other aspects of masturbation or sexuality. Regarding sexual satisfaction (NSSS-SD), there are no significant correlations between individual aspects of masturbation (frequency, ability to orgasm, and age at first masturbation). However, masturbation is suggested to positively influence sexual satisfaction [9].

Fascinating is that for this sample, positive correlations were found between masturbation satisfaction and overall sexual satisfaction (NSSS-SD) and with life satisfaction (SWLS). Individual aspects of masturbation (e.g., frequency) do not significantly affect sexual satisfaction or life satisfaction, but masturbation satisfaction does. It is possible that masturbation satisfaction, as a variable, represents a higher-level qualitative criterion combining individual aspects of masturbation. Therefore, the construct of masturbation satisfaction must be examined more closely in future research, and individual criteria for masturbation satisfaction must be extracted and validated.

For certain sex variables, some significant correlations

with sexual satisfaction (NSSS-SD) were found in this study. The frequency and the ability to orgasm during sex have been shown to have a positive effect on sexual satisfaction. This result is supported by other studies [25,17]. Overall, it is not so much masturbation as partnered sexual experience that influences sexual satisfaction. In addition, there is the possibility that masturbation can also occur, e.g., through one's clitoral stimulation during sexual intercourse. A recent study addresses this matter [18] and shows that only a small proportion of women surveyed practice self-stimulation during sex with their partners. For some women (23.3%), this method of achieving orgasm seemed embarrassing. In addition, how often women masturbate during sex in order to orgasm is believed to be apparently irrelevant to sexual satisfaction [18]. Previous studies have shown that women's sexual satisfaction significantly affects life satisfaction and overall well-being [22-24,13]. These findings could be confirmed by the results of this study ($r: .237$). This once again highlights the relevance of the necessary research on diverse aspects of female sexuality be able to draw conclusions and possible interventions for improving sexual satisfaction and thus also the quality of life.

Conclusion

The present study is one of the very few investigations that have been conducted so far in the field of female masturbation and one of the first to deal in detail with the various aspects of masturbation. The majority of the previously postulated assumptions could be confirmed on the data collected. Significant correlations within individual masturbation variables, such as masturbation frequency, age of first masturbation, and orgasmic ability during masturbation. From the correlative associations, we can hypothesize the following: The younger the women were at their first masturbation experience, the more frequently they practiced masturbation. The more frequently the women experienced orgasm during masturbation, the higher the participants reported their satisfaction with their masturbation. In addition, satisfaction with one's masturbation, as an overarching variable of masturbation, is related to sexual satisfaction and life satisfaction. In contrast to the individual masturbation aspects, clear correlations of the individual sex variables (coitus frequency, ability to orgasm during sex) to sexual satisfaction are shown. Furthermore, the connection between sexual satisfaction and life satisfaction is underlined.

Outlook: The extent to which masturbation experiences influence women's sexuality should be further investigated in future studies. Furthermore, it could be discussed whether the experience of masturbation, for example, the experience of orgasm during masturbation, is related to sexual pleasure for women in the first place. [2] Postulate the suggestion that female masturbation might be seen more as a method of relaxation and stress management. For this, further research would need to explore women's motives for masturbation. In addition, the environment in which women grow up could play a role in their masturbation behavior. Thus, recording the individual's culture, religion, and sexual education, could provide new insights into the experience and behavior of masturbation and women's sexual satisfaction. It can be assumed that individual techniques for sexual arousal are explored and practiced during masturbation. Types of stimulation that directly stimulate the clitoris (by the woman herself or her partner) are more likely to result in orgasm during sexual intercourse [18]. It is conceivable that women may transfer their experiences from

masturbation to partnered sex and thus experience a more satisfying sexuality. This underlines the future need for more knowledge about masturbation as a part of female sexuality and the courage to rethink sexual education concepts creatively. Although most of the population has access to information about the biology and physiology of sexuality, significant gaps in knowledge and misconceptions persist. Sexuality education curricula should focus on masturbation as a learning mechanism in addition to education about the female menstrual cycle, sexually transmitted diseases, contraception, and pregnancy to show women a way to better know their own bodies [14]. Naming the differences between female and male sexuality and acknowledging their normality could already offer women a new perspective, dissolve deep-seated stereotypes, and thus provide some relief [18].

References

1. Driemeyer W. Masturbation und sexuelle Gesundheit-Ein Forschungsüberblick. *Zeitschrift für Sexualforschung*. 2013; 26(04): 372-383.
2. Burri A, Carvalheira A. Masturbatory behavior in a population sample of German women. *The journal of sexual medicine*. 2019; 16(7): 963-974.
3. Aude A, Matthiesen S. Mädchen und Selbstbefriedigung. Geschlechterunterschiede in Verbreitung, Frequenz und Einstellungen zur Masturbation. *BZgA FORUM, Sexuaufklärung und Familienplanung*. 2013; 19-22.
4. Ejder Apay S, Nagorska M, Balci Akpınar R, Sis Çelik A, & Binkowska-Bury M. Student comparison of sexual myths: two-country case. *Sexuality and Disability*. 2013; 31(3): 249-262.
5. Dekker A, Schmidt G. Patterns of masturbatory behaviour: Changes between the sixties and the nineties. *Journal of Psychology & Human Sexuality*. 2003; 14(2-3): 35-48.
6. Henning AM, Bremer-Olszewski T. *Make Love - Ein Aufklärungsbuch*. Berlin: Rogner & Bernhard. 2012.
7. Clement U, Schmidt G, Kruse M. Changes in sex differences in sexual behavior: A replication of a study on West German students (1966-1981). *Archives of sexual behavior*. 1984; 13(2): 99-120.
8. Carvalheira A, Leal I. Masturbation among women: Associated factors and sexual response in a Portuguese community sample. *Journal of Sex & Marital Therapy*. 2013; 39(4): 347-367.
9. Coleman EJ, Bockting WO. *Masturbation as a means of achieving sexual health*. Routledge. 2013.
10. Das A. Masturbation in the United States. *Journal of Sex & Marital Therapy*. 2007; 33(4): 301-317.
11. Herbenick D, Reece M, Schick V, Sanders SA, Dodge B, et al. Sexual behavior in the United States: Results from a national probability sample of men and women ages 14-94. *The journal of sexual medicine*. 2010; 7: 255-265.
12. Haning RV, O'Keefe SL, Randall EJ, Kommor MJ, Baker E, et al. Intimacy, orgasm likelihood, and conflict predict sexual satisfaction in heterosexual male and female respondents. *Journal of Sex & Marital Therapy*. 2007; 33(2): 93-113.
13. Hoy M, Strauß B, Kröger C, Brenk-Franz K. Überprüfung der deutschen Kurzversion der, New Sexual Satisfaction Scale (NSSS-SD) in einer repräsentativen Stichprobe. *PPmP-Psychotherapie. Psychosomatik· Medizinische Psychologie*. 2019; 69(03/04): 129-135.
14. Bowman CP. Women's masturbation: Experiences of sexual empowerment in a primarily sex-positive sample. *Psychology of Women Quarterly*. 2014; 38(3): 363-378.
15. Gerressu M, Mercer CH, Graham CA, Wellings K, Johnson AM. Prevalence of masturbation and associated factors in a British national probability survey. *Archives of sexual behavior*. 2008; 37(2): 266-278.
16. Dunn KM, Cherkas LF, Spector TD. Genetic influences on variation in female orgasmic function: A twin study. *Biology Letters*. 2005; 1(3): 260-263.
17. Philippsohn S, Hartmann U. Determinants of sexual satisfaction in a sample of German women. *The journal of sexual medicine*. 2009; 6(4): 1001-1010.
18. Hoy M, Villwock P, Strauß B, Brenk-Franz K. Die Rolle der Stimulationsart für den weiblichen Orgasmus: Psychometrische Eigenschaften der deutschsprachigen Version der Female Orgasm Scale (FOS) und der Clitoris Self-Stimulation Scale (CSSS). *Zeitschrift für Sexualforschung*. 2021; 34(02): 79-88.
19. Linhart V. *Der weibliche Orgasmus-Forschungsergebnisse zur Sexualpsychologie*. Hamburg: Verlag Dr. Kovac. 2012.
20. Sigmund M, Kvintová J, Hřebíčková H, Šafář M, Sigmundová D. Life satisfaction, health, self-evaluation and sexuality in current university students of sport sciences, education and natural sciences. *Acta Gymnica*. 2014; 44(4): 231-241.
21. Baumeister RF. Gender differences in erotic plasticity: The female sex drive as socially flexible and responsive. *Psychological bulletin*. 2000; 126(3): 347.
22. Laumann EO, Paik A, Glasser DB, Kang JH, Wang T, et al. A cross-national study of subjective sexual well-being among older women and men: Findings from the Global Study of Sexual Attitudes and Behaviors. *Archives of sexual behavior*. 2006; 35(2): 143-159.
23. Rosen RC, Bachmann GA. Sexual well-being, happiness, and satisfaction, in women: The case for a new conceptual paradigm. *Journal of sex & marital therapy*. 2008; 34(4): 291-297.
24. Neto F. The satisfaction with sex life scale. *Measurement and Evaluation in Counseling and Development*. 2012; 45(1): 18-31.
25. Schönbacher V. Sexuelle Zufriedenheit von Frauen: Psychosoziale Faktoren. *Zeitschrift für Sexualforschung*. 2007; 20(01): 21-41.
26. Aigner JC. *Vorsicht Sexualität. Sexualität in Psychotherapie, Beratung und Pädagogik - eine integrative Perspektive*. Stuttgart: Kohlhammer. 2013.
27. Glaesmer H, Grande G, Braehler E, Roth M. The German version of the Satisfaction with Life Scale (SWLS). *European Journal of Psychological Assessment*. 2011; 127-132.
28. Mallants C, Casteels K. Practical approach to childhood masturbation-a review. *European journal of pediatrics*. 2008; 167(10): 1111-1117.
29. Nemati ALJ, Weitkamp K. The female orgasmic state and the different dimensions of the female sexual experience: Lessons learned from expert interviews. *Sexual and Relationship Therapy*. 2020; 1-24.