Objective: Masturbation is a behavior that can enhance sexual functioning. This study aims to analyze differences between men and women in different masturbation parameters, and to examine their relation with orgasm satisfaction in sexual relationships.

Method: One thousand three hundred and thirty-five men and women from the Spanish population aged 18–83 years (M = 36.91; SD = 11.86) participated in an online survey. A questionnaire was used to collect socio-demographic, sexual history data, negative attitude toward masturbation, solitary sexual desire and orgasm subjective experience upon masturbation were assessed. Given the differences between men and women, independent regression models are proposed to explain orgasm satisfaction in the sexual relationships context.

Findings: Men, compared to women, masturbated at a younger age (p < 0.001), and reported higher current masturbation frequency (p < 0.001) and more solitary sexual desire (p < 0.001). Women reported greater intensity in the subjective orgasm experience on its Affective (p < 0.001), Sensory (p < 0.001) and Intimacy (p < 0.001) dimensions. Regarding regression models, the Affective dimension of orgasm was a common parameter in men (β = 0.36; p < 0.001) and women (β = 0.24) to explain orgasm satisfaction during sexual relationships. In men, solitary masturbation frequency (β = −0.10; p = 0.027) acquired a significant role. In women, the model also included age (β = 0.09; p = 0.038), negative attitude toward masturbation (β = −0.12; p = 0.005) and solitary sexual desire (β = −0.19; p = 0.001).

Conclusion: When dealing with men and women’s orgasm difficulties in the sexual relationships context, it is important to consider the role of masturbation. In men and women, the Affective dimension of the orgasm experience explain the orgasm satisfaction in sexual relationship. Also, in men, the solitary masturbation frequency is negatively related with orgasm satisfaction in sexual relationship, supporting the compensatory hypothesis of masturbation. In women, in addition to the Affective dimension, the orgasm satisfaction in sexual relationship is explained, negatively, by the negative
Introducción

Masturbación es un comportamiento relativamente frecuente que es positivamente asociado con la salud sexual (1–5). Más importancia ha sido asignada a estudiarlo en los últimos decenios, y su capacidad para promover el conocimiento sobre el auto y estimular respuestas positivas ha sido destacada (6, 7). Entre estos buenos puntos, su utilidad en la terapia sexual para mejorar la función sexual ha sido resaltada (8).

Muy poca evidencia existe para la relación entre la masturbación y las relaciones sexuales (9). La asociación entre ambos comportamientos ha sido descrita por dos modelos: compensatorio vs. complementario. El primero propone que la masturbación se utiliza para reemplazar relaciones sexuales que no se hacen (10, 11). El hecho de que la frecuencia de la masturbación esté relacionada con una menor satisfacción sexual, y que ha sido descrito para las mujeres, favorece este modelo (12). El modelo complementario sostiene que una relación positiva existe entre ambos comportamientos, y aumentando la práctica de uno, estaría asociado con un incremento en el otro (13). El modelo complementario sugiere que una relación directa positiva existe entre ambos comportamientos, y aumentando la práctica de uno, estaría asociado con un incremento en el otro (14).

Algunos trabajos sugieren que la masturbación no ofrece un beneficio unívoco para las relaciones sexuales (15–17). No obstante, se ha encontrado que las mujeres que masturban son más propensas a tener orgasmos durante las relaciones sexuales (18), y ellas que masturban de manera más frecuente describen experiencias sexuales mejoradas en parejas y menor inhibición sexual (2, 3). Las técnicas como el Masturbación guiada pueden proporcionar estimulación placentera desde el conocimiento de puntos de placer, lo que mejora la facilidad orgásmica de las mujeres mientras que las parejas practican el sexo (19). Por lo tanto, aprender a tener orgasmos mediante la masturbación permite a las mujeres ajustar y generalizar esta respuesta orgásmica en las relaciones sexuales en parejas (20). Estos hallazgos apuntan a la utilidad de la masturbación como primera línea de tratamiento para el Trastorno Orgásmico de la Mujer (20, 21).

A pesar de algunos hallazgos que favorecen la práctica de la masturbación para mejorar la capacidad orgásmica, muy poca investigación existente tiene en cuenta el papel que desempeñan los diferentes parámetros relacionados con este comportamiento en los contextos de relaciones sexuales. De estos parámetros, la actitud hacia la masturbación, el deseo sexual solitario y la experiencia orgásmica subjetiva son destacados. La relevancia de la masturbación en el entendimiento de la función sexual es resaltada.

Palabras clave: satisfacción orgasmática, relaciones sexuales en pareja, masturbación, experiencia orgásmica subjetiva, actitud hacia la masturbación, diferencias sexuales
inclusion criteria were: (a) having Spanish nationality; (b) being heterosexual; (c) currently engaging in sexual relationships; (d) having solitary masturbation experience. Table 1 shows the samples’ socio-demographic characteristics.

Measures

Background questionnaire. This instrument collects data about sex, age, level of education, nationality, sexual orientation, partner relationship, frequency of prayer, age when the first masturbation experience occurred and masturbation frequency.

The Spanish version of the Negative Attitudes Toward Masturbation Inventory (NATMI) (25, 31). It evaluates negative attitudes toward masturbation with 10 items (e.g., “I feel guilty about masturbating”) answered on a 5-point Likert-type scale: 1 (Not at all true for me) to 5 (Extremely true for me). Higher scores indicate a more negative attitude towards masturbation. It has a high internal consistency (alpha ordinal) of 0.95, and presents suitable evidence for construct and discriminant validity with other psychosexual variables and masturbation experience occurred and masturbation frequency. It includes a high internal consistency (alpha ordinal) of 0.95, and presents suitable evidence for construct and discriminant validity with other psychosexual variables and masturbation experience.

The Solitary Sexual Desire subscale from the Spanish version of the Sexual Desire Inventory (SDI) (28, 32). It consists of four items (e.g., “How strong is your desire to engage in sexual behavior by yourself?”) and measures interest in solitary sexual activity using different Likert response scales depending on the item (e.g., from 0 = No desire to 8 = Strong desire). Higher scores show more solitary desire. It presents good internal consistency (Cronbach’s alpha higher than 0.90) and evidence for external validity. Cronbach’s alpha in the present study was 0.91.

The Spanish version of the Orgasm Rating Scale (ORS) (33) adapted to the solitary masturbation context by Cervilla et al. (29). It assesses the subjective orgasm experience in the solitary masturbation context (during any sexual activity performed alone) with 25 adjectives distributed on four dimensions: Affective, Sensory, Intimacy, and Rewards. Items are answered on a 6-point Likert-type scale: 0 (Does not describe it at all) to 5 (Describes it perfectly). Higher scores indicate more intensity in the subjective orgasm experience. Its internal consistency reliability is good and ranges from 0.71 to 0.95. It adequately evidences validity, provided by its measures. In our study, the ordinal alphas for the different subscales were: 0.93 for Affective, 0.94 for Sensory, 0.72 for Intimacy and 0.89 for Rewards.

The Spanish version of the Arizona Sexual Experience Scale (ASEX) (34) of Sánchez-Fuentes et al. (35). It consists of five items that assess general sexual functioning (sexual desire, arousal, erection for men/lubrication for women, orgasm, and orgasm satisfaction) in the last 7 days in the sexual relationship context. It uses a Likert-type scale from 1 (hypofunction) to 6 (hyperfunction). It presents good internal consistency (Cronbach’s alpha 0.81 in men, 0.79 in women) and evidences validity. The orgasm-related item referring to orgasm satisfaction was taken into account. Its score was inverted, so higher scores evidenced more orgasm satisfaction.

Table 1

| Variables | Total N = 1,335 | Men n = 738 | Women n = 597 |
|-----------|----------------|-------------|--------------|
| Age M (SD) | 36.91 (11.86) | 37.62 (12.43) | 36.04 (11.07) |
| Level of education n (%) | | | |
| Primary education | 53 (4.0) | 26 (3.5) | 27 (4.5) |
| Secondary education | 390 (29.2) | 233 (31.3) | 159 (26.6) |
| University degree (ongoing or completed) | 892 (66.8) | 481 (65.2) | 411 (68.9) |
| Currently have a partner n (%) | | | |
| Yes | 988 (74.0) | 524 (71.0) | 464 (77.7) |
| No | 347 (26.0) | 214 (29.0) | 133 (22.3) |
| Praying frequency n (%) | | | |
| Never | 989 (74.1) | 523 (70.90) | 466 (78.1) |
| Less than once a month | 123 (9.2) | 67 (9.1) | 56 (9.4) |
| Once a month | 7 (0.5) | 6 (0.8) | 1 (0.2) |
| A few times a month | 54 (4.0) | 32 (4.3) | 22 (3.7) |
| Once a week | 8 (0.6) | 3 (0.4) | 5 (0.8) |
| A few times a week | 57 (4.3) | 34 (4.6) | 23 (3.9) |
| Once a day | 60 (4.5) | 41 (5.6) | 19 (3.2) |
| More than once a day | 37 (2.8) | 32 (4.3) | 5 (0.8) |

Procedure

Data collection was conducted by distributing a survey using LimeSurvey, which was promoted by paying to Facebook (900€) from 23 December 2019 to 15 March 2020 by adults from Spain. In order to improve the representativeness of the sample, the promotion targeted both men and women from different age groups. Online assessments are normally used to evaluate sexual behaviors (1,36,37). Previous studies have confirmed that there are no differences between online and paper-and-pen methods (38,39). To avoid automatic or fraudulent responses, IP was controlled and a CAPTCHA was used. In addition, responses were carefully examined to rule out non conclusive or abnormal cases. Participation was voluntary, and both anonymity and confidentiality of responses were guaranteed. There was no compensation for taking part in the study. All the participants received informed consent with the study aim before responding. This research was approved by the Ethics Committee of Human Research of the University of Granada.
TABLE 2  Effects of sex on masturbation-related indicators.

| Variables                        | M (DT) | Males (n = 738) | Females (n = 597) | F(1, 1,329) | p      | Cohen’s d |
|----------------------------------|--------|----------------|-------------------|-------------|--------|-----------|
| First masturbation experience    | 12.60  | 15.13 (5.92)   | 14.01             | <0.001      | 0.60   |
| Current frequency of solitary masturbation | 3.17 (0.94) | 2.50 (0.96)   | 185.11            | <0.001      | 0.70   |
| Negative attitude toward masturbation | 13.03 (3.09) | 13.13 (2.32) | 1.91              | 0.167       | -      |
| Solitary sexual desire           | 21.59  | 19.75 (6.28)   | 31.96             | <0.001      | 0.31   |
| Subjective orgasm experience-Affective | 25.66 (4.84) | 27.05 (3.85) | 31.69             | <0.001      | 0.31   |
| Subjective orgasm experience-Intimacy | 33.65 (15.74) | 39.17 (15.15) | 47.75             | <0.001      | 0.36   |
| Subjective orgasm experience-Sensory | 7.62 (3.64) | 8.19 (3.71)   | 12.48             | <0.001      | 0.15   |
| Subjective orgasm experience-Rewards | 11.34 (3.36) | 11.56 (3.59) | 1.82              | 0.177       | -      |

Statistical analysis

A cross-sectional correlational study is proposed. First, missing values were imputed using a random forest algorithm by considering the associated variables. To examine differences in the masturbation parameters between men and women, a MANCOVA was applied for first masturbation experience (age), current solitary masturbation frequency (“Never,” “Less than once a month,” “Once a month,” “A few times a month,” “Once a week,” “A few times a week,” “Once a day,” and “More than once a day”), negative attitude toward masturbation, solitary sexual desire and subjective orgasm experience caused by masturbation, and by taking into account these covariates: age, level of education (“Primary Education,” “Secondary Education” and “University degree–ongoing or completed-”), having a partner (yes or no) and frequency of prayer (similar to the “University degree–ongoing or completed-”), having a partner (yes or no) and frequency of prayer (similar to the “University degree–ongoing or completed-”), having a partner (yes or no) and frequency of prayer (similar to the “University degree–ongoing or completed-”), having a partner (yes or no) and frequency of prayer (similar to the “University degree–ongoing or completed-”). To examine differences found by sex, the subsequent analyses were presented separately for men and women. The capacity of the masturbation parameters to explain orgasm satisfaction was examined by multiple linear regression using the enter method.

The R® environment was employed (version 3.6.3) (40) with its RStudio® interface (version 1.2.5042) (41). For missing value imputations, the missForest package was used (version 1.4) (42). For the ordinal alpha, the Psych package was applied (version 1.9.12.31) (43). The other statistical analyses were performed with SPSS v.22.

Results

Sex differences in the masturbation parameters

The significant multivariate covariates were age [Wilk’s lambda = 0.87; F(8,1,322) = 24.49, p < 0.001; η² = 0.129], having a partner [Wilk’s lambda = 0.94; F(8,1,322) = 10.91, p < 0.001; η² = 0.23] and frequency of prayer [Wilk’s lambda = 0.96; F(8,1,322) = 7.42, p < 0.001; η² = 0.04]. Sex had a main effect on the masturbation parameters [Wilk’s lambda = 0.77; F(8,1,322) = 48.91, p < 0.001; η² = 0.23]. The intersubject effect on these indicators is shown in Table 2.

Regression models

For men, a significant model was obtained that explained orgasm satisfaction in sexual relationships [F (9, 728) = 13.01; p < 0.001]. Current solitary masturbation frequency (β = −0.10) and the Affective dimension of orgasm (β = 0.36) explained 13% of variance (See Table 3). The model was also significant for women [F (9, 587) = 8.88; p < 0.001] and explained 11% of orgasm satisfaction from age (β = 0.09), negative attitude toward masturbation (β = −0.12), solitary sexual desire (β = 0.19) and the Affective dimension of orgasm (β = 0.24) (See Table 4).

Discussion

Masturbation is a sexual behavior that is contemplated to deal with sexual dysfunctions, especially orgasm difficulties (44–46). Justifying the use of masturbation in sexual therapy lies in the relation between this behavior and orgasm in sexual relationships. This is why the present study analyzes the relation between different masturbation parameters in men and women (i.e., first masturbation experience, current solitary masturbation frequency, negative attitude toward masturbation, solitary sexual desire and subjective orgasm experience) with orgasm satisfaction in sexual relationships. The results show differences between men and women in the masturbation parameters, and also in the role that these parameters play in explaining orgasm satisfaction in the sexual relationships context.

The first hypothesis is backed by significant differences between men and women in the different masturbation parameters. We observe that men’s first masturbation experience took place at an earlier age than it did in women, whose finding coincides with previous studies (1, 2, 25, 30, 47).
Traditional sexual socialization could favor more permissiveness in men and more guilty feelings associated with women practicing masturbation (48). In turn, the differences found in solitary masturbation frequency coincide with previous works in the literature, and a more frequent masturbation frequency observed for men (25, 49, 50). Attitude to the sexual double standard (i.e., the distinct evaluation made of sexual behavior depending on whether it is practiced by a man or a woman) could explain these differences given the greater sexual freedom or permissiveness that men have been traditionally conferred than women (38). Alternative considerations have also been applied to explain these differences in association with hormone levels (51).

It is worth mentioning that no differences have been found in negative attitude toward masturbation between men and women. The fact that such differences are lacking could be related to an increasingly more positive change of attitude in both men and women, as observed in other attitudes like erotophilia (52). These results contradict those recently obtained in older people and reported by Sierra et al. (30), who indicate that men older than 50 years take a more negative attitude toward masturbation than women of a similar age. This could indicate younger generations’ positive attitude toward masturbation. This question reflects the need to further study in-depth attitudes toward masturbation and the factors related to it to better understand this matter (25). Regarding differences in solitary sexual desire, the highest level found for men is consistent with previous works that report similar results (27, 28, 53, 54). This is congruent with those studies showing a close association between masturbation and solitary sexual desire (55).

On subjective orgasm experience in solitary masturbation, and in line with the results obtained by previous studies that have examined the subjective orgasm experience in the heterosexual relationships context (36, 56), women report greater intensity than men, except on the Reward dimension, which has also been shown for the gay population (57). To explain differences in orgasm intensity between men and women, women have been proposed to better localize orgasms anatomically (56), which would be associated with perceiving greater intensity (58). It has

### TABLE 3 Multiple regression models for orgasmic satisfaction in men.

| Predictors                                      | B    | SE   | β    | 95% CI       | t    | p   | R²  | VIF |
|------------------------------------------------|------|------|------|--------------|------|-----|-----|-----|
| Orgasmic satisfaction                           | 0.00 | 0.00 | 0.01 | −0.06, 0.01  | 0.03 | 0.974 | 0.13 | 1.23 |
| Age                                            | −0.01| 0.02 | −0.03| −0.05, 0.02  | 0.88 | 0.379 | 1.08 |     |
| First masturbation experience                   | −0.10| 0.04 | −0.10| −0.19, 0.01  | 2.22 | 0.027 | 1.79 |     |
| Current frequency of solitary masturbation     | −0.01| 0.01 | −0.05| −0.04, 0.01  | 1.31 | 0.191 | 1.15 |     |
| Negative attitude toward masturbation          | 0.01 | 0.01 | 0.08 | −0.00, 0.03  | 1.77 | 0.076 | 1.92 |     |
| Solitary sexual desire                          | 0.07 | 0.01 | 0.36 | 0.05, 0.08   | 7.70 | <0.001 | 1.85 |     |
| Subjective orgasm experience-Affective         | −0.00| 0.00 | 0.00 | −0.01, 0.00  | 1.09 | 0.275 | 1.93 | 1.93 |
| Subjective orgasm experience-Sensory           | 0.00 | 0.01 | 0.01 | −0.02, 0.03  | 0.32 | 0.746 | 1.70 |     |
| Subjective orgasm experience-Intimacy          | −0.01| 0.01 | −0.03| −0.03, 0.01  | −0.78| 0.438 | 1.40 |     |

R, non-standardized beta; SE, standard error; β, standardized beta; 95% CI, 95% confidence interval; VIF, variance inflation factor.

### TABLE 4 Multiple regression models for orgasmic satisfaction in women.

| Predictors                                      | B    | SE   | β    | 95% CI       | t    | p   | R²  | VIF |
|------------------------------------------------|------|------|------|--------------|------|-----|-----|-----|
| Orgasmic satisfaction                           | 0.01 | 0.00 | 0.09 | 0.00, 0.02   | 2.08 | 0.038 | 0.11 | 1.21 |
| Age                                            | 0.01 | 0.01 | 0.04 | −0.01, 0.02  | 1.01 | 0.314 | 1.10 |     |
| First masturbation experience                   | −0.07| 0.06 | −0.07| −0.18, 0.04  | −1.27| 0.203 | 1.88 |     |
| Current frequency of solitary masturbation     | −0.05| 0.02 | −0.12| −0.09, −0.01 | −2.80| 0.005 | 1.15 |     |
| Negative attitude toward masturbation          | 0.03 | 0.01 | 0.19 | 0.01, 0.05   | 3.43 | 0.001 | 2.11 |     |
| Solitary sexual desire                          | 0.06 | 0.01 | 0.24 | 0.04, 0.09   | 4.91 | <0.001 | 1.65 |     |
| Subjective orgasm experience-Affective         | −0.00| 0.00 | −0.03| −0.01, 0.00  | −0.52| 0.606 | 1.77 |     |
| Subjective orgasm experience-Sensory           | 0.00 | 0.01 | 0.01 | −0.03, 0.03  | 0.12 | 0.906 | 1.68 |     |
| Subjective orgasm experience-Intimacy          | −0.02| 0.01 | −0.08| −0.05, 0.00  | −1.70| 0.090 | 1.46 |     |

R, non-standardized beta; SE, standard error; β, standardized beta; 95% CI, 95% confidence interval; VIF, variance inflation factor.
also been indicated that women could have a bigger repertoire to describe their orgasm sensations (57, 59). Regarding the differences in their dimensions, not finding discrepancies would be expected on the Rewards dimension, which is made up of the items “peaceful,” “relaxing,” and “soothing,” because both men and women have pointed out that relaxing is one of the main reasons to masturbate (13, 60, 61).

Regarding our second hypothesis, orgasm satisfaction in the sexual relationships context is explained in both men and women by some masturbation parameters. In the model for men and women, the Affective dimension of the subjective orgasm experience during masturbation significantly and positively explains orgasm satisfaction in the sexual relationships context. Former findings stress the importance of the Affective dimension of the subjective orgasm experience for the sexual relationships context, especially for women (62). So it might seem logical to think that this could be the case in the masturbation context where this dimension is more important for explaining orgasm satisfaction in sexual relationships.

Apart from the orgasm Affective dimension in the men's model, higher solitary masturbation frequency is also associated with lower orgasm satisfaction. These results might appear to contradict works that have described how frequency is associated with more consistent orgasms (7). However, in line with previous studies (30, 52), this association might be explained by the compensatory model of masturbation; that is, masturbation serving as a substitute of unsatisfactory sexual relationships. Therefore, lower orgasm satisfaction in the sexual relationships context might be expected to be compensated by higher masturbation frequency (26, 63).

In women, apart from the Affective dimension of orgasm, age and solitary sexual desire are positively associated, with orgasm satisfaction in sexual relationships. The positive association of age would be expected because former works inform about a higher orgasm pleasure level with increasing age (18, 61). Moreover, the positive relation between sexual desire and sexual functioning has been well-described (27, 28, 64). In fact solitary sexual desire is associated with higher masturbation frequency (1, 55), which might imply more self-erotic experiences and sexual self-knowledge (3). Finally, the fact that negative attitude toward masturbation is related to lower orgasm satisfaction is consistent with previous works (25, 65). This attitude has been associated with lower masturbation frequency (25), which might imply fewer opportunities for both sexual response self-knowledge and the associated pleasure points (7, 19).

Some differences between the models for men and women are worth stressing. The positive effect of age is only observed in women. This suggests that women benefit from enjoying more orgasm satisfaction as they age to a certain extent. Despite a negative association between age and orgasm capacity having been previously described (36, 66), these results are consistent with some findings which reveal that women need time to interiorize a more positive relation with masturbation due to the stigmatization that their engagement in such behavior might imply (2). This suggests that the positive effects of masturbation could increase as women age. Besides, solitary masturbation frequency only has a significant effect on men, which falls in line with former results which point out that masturbation frequency in women is not significantly associated with orgasm outcomes (18). As higher masturbation frequency in men is associated with lower orgasm satisfaction in sexual relationships, it would be coherent to think that solitary sexual desire plays no relevant role to explain men's orgasm satisfaction. Finally, the differences observed in the models of men and women fall in line with the previous literature, which emphasizes how women's orgasm is associated with more variables than it is for men (56, 57, 67).

This study has its limitations, which must be taken into account to generalize its results. The study sample was formed by incidental non-probabilistic sampling over social networks and only included the heterosexual population. The cross-sectional correlational experimental design and the performed statistical analyses do not allow for causality relations. So, it may be need longitudinal studies to have a deep approach about the relationship between masturbation and sexual relationships. Different parameters of masturbation could be taken into account in future studies, such as the duration of masturbation, the use of erotic toys, the techniques used or the consumption of pornography. Notwithstanding, the findings are believed relevant for its contribution to the study of masturbation and orgasm satisfaction in the sexual relationships context.

**Conclusion**

The obtained results confirm the differences between men and women in the masturbation parameters and their role to explain orgasm satisfaction in sexual relationships. The Affective dimension of the subjective orgasm experience during solitary masturbation is stressed as a common variable for both men and women to explain orgasm satisfaction in sexual relationships. More masturbation parameters associated with orgasm satisfaction are observed in women than men. These findings suggest that the relation between solitary masturbation and sexual relationships is a complex one. Masturbation in men could be a substitute for the satisfaction not achieved with orgasm in sexual relationship; in women, the negative attitude toward this behavior would be associated with lower orgasmic satisfaction, and a greater solitary sexual desire could promote more sexual self-knowledge. So it is important to consider these results to look more closely at the association between both sexual behaviors, and to further consolidate the usefulness of solitary masturbation in sexual therapy. Therefore, solitary masturbation is an available resource that should also be
promoted in the community context as it can improve the sexual health of the population.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Ethics Committee of Human Research of the University of Granada. The patients/participants provided their written informed consent to participate in this study.

Author contributions

The concept and analysis: JCS. Acquisition, analysis, interpretation of data, drafting of the manuscript, critical revision of the manuscript, and statistical analysis: JCS and OC. All authors contributed to the article and approved the submitted version.

References

1. Burri A, Carvalheira A. Masturbatory behavior in a population sample of German women. J Sex Med. (2019) 16:963–74. doi: 10.1016/j.jsxm.2019.04.015
2. Carvalheira A, Leal I. Masturbation among women: associated factors and sexual response in a Portuguese community sample. J Sex Marital Ther. (2013) 39:347–67. doi: 10.1080/0092623X.2011.628440
3. Coleman E. Masturbation as a means of achieving sexual health. J Psychol Human Sex. (2003) 14:15–16. doi: 10.1300/J056v14n02_02
4. Kaestle CI, Allen KR. The role of masturbation in healthy sexual development: perceptions of young adults. Arch Sex Behav. (2011) 40:983–94. doi: 10.1007/s10508-010-9722-0
5. Kiliç Önar D, Armstrong H, Graham CA. What does research tell us about women’s experiences, motives and perceptions of masturbation within a relationship context? A systematic review of qualitative studies. J Sex Marital Ther. (2020) 46:683–716. doi: 10.1080/0092623X.2020.1781722
6. Driemeyer W. Masturbation and sexual health: a research overview. Z Sexualforsch. (2013) 26:372–83. doi: 10.1055/s-0033-1356159
7. Matsick JL, Conley TD, Moors AC. The science of female orgasms: pleasing latency and related parameters in women during partnered and masturbatory sex. J Psychol Hum Sex. (2013) 26:372–83. doi: 10.1080/0092623X.2012.734574
8. Kingsberg SA, Althof S, Simon JA, Bradford A, Bitzer J, Carvalho J, et al. Female sexual dysfunction—medical and psychological treatments, committee 14. J Sex Med. (2017) 14:1463–91. doi: 10.1007/s11919-017-1580-2
9. Rowland DL, Sullivan SL, Hevesi K, Hevesi B. Orgasmic latency and related parameters in women during partnered and masturbatory sex. J Sex Med. (2018) 15:1463–71. doi: 10.1016/j.jsxm.2018.08.003
10. Rowland D, Donarski A, Graves V, Caldwell C, Hevesi B, Hevesi K. The experience of orgasmic pleasure during partnered and masturbatory sex in women with and without orgasmic difficulty. J Sex Marital Ther. (2019) 45:550–61. doi: 10.1080/0092623X.2019.1680231
11. Komisaruk BR, Beyer-Flores C, Whipple B. The science of orgasm. Socioaffect Neurosci Psychol. (2016) 6:1–21. doi: 10.3402/snp.v6.31624
12. Klapilová K, Brody S, Krejčová L, Hušárová B, Binter J. Sexual satisfaction, sexual compatibility, and relationship adjustment in couples: the role of sexual behaviors, orgasm, and men’s discernment of women’s intercourse orgasm. J Sex Med. (2015) 12:667–75. doi: 10.1011/jsexm.12766
13. Fahs B, Frank E. Notes from the back room: gender, power, and (In)Visibility in women’s experiences of masturbation. J Sex Res. (2014) 51:241–52. doi: 10.1080/00224499.2012.734574
14. Pinkerton SD, Bogart LM, Cecile H, Abramson PR. Factors associated with masturbation in a collegiate sample. J Psychol Hum Sex. (2003) 14:103–21. doi: 10.1300/J056v14n02_07
15. Kontula T, Miettinen A. Determinants of female sex orgasm. Socioaffect Neurosci Psychol. (2018) 10:1–11. doi: 10.3402/snp.v10.10284
16. Leff JJ, Israel M. The relationship between mode of female masturbation and achievement of orgasm in coitus. Arch Sex Behav. (1983) 12:227–36. doi: 10.1007/BF01542073
17. Rowland DL, Sullivan SL, Hevesi K, Hevesi B. Sexual satisfaction, and achievement of orgasm in coitus. Arch Sex Behav. (1983) 12:227–36. doi: 10.1007/BF01542073
18. Rowland D, Donarski A, Graves V, Caldwell C, Hevesi B, Hevesi K. The experience of orgasmic pleasure during partnered and masturbatory sex in women with and without orgasmic difficulty. J Sex Marital Ther. (2019) 45:550–61. doi: 10.1080/0092623X.2019.1680231
19. Komisaruk BR, Beyer-Flores C, Whipple B. The science of orgasm. Socioaffect Neurosci Psychol. (2016) 6:1–21. doi: 10.3402/snp.v6.31624
20. Marchand E. Psychological and behavioral treatment of female orgasmic disorder. Sex Med Rev. (2021) 9:194–211. doi: 10.1016/j.sxmr.2020.07.007
21. Laan E, Rellini AH, Barnes T. Standard operating procedures for female orgasmic disorder: consensus of the international society for sexual medicine. J Sex Med. (2013) 10:74–82. doi: 10.1111/j.1743-6109.2012.02880.x

Funding

This study has been funded by the Ministerio de Ciencia, Innovación y Universidades through the Research Project RTI2018-093317-B-I00 and the Bursary FPU18/03102 for University Professor Training as part of OC’s thesis (Psychological Doctoral Programme B13 56 1; RD 99/2011).

Conflict of interest

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premature ejaculation. Asian J Androl. (2019) 21:631–4. doi: 10.4103/ajaj.a_34_19

46. Waldinger MD. Delayed and premature ejaculation. In: Balon R, Taylor Segraves R, editors. Clinical Manual of Sexual Disorders. Nueva York, NY: American Psychiatric Publishing (2009). p. 273–304.

47. Driemeyer W, Janssen E, Wittfang J, Elmerstig E. Masturbation experiences of Swedish senior high school students: gender differences and similarities. J Sex Res. (2017) 54:631–41. doi: 10.1080/00224490.2016.1167814

48. Sierra JC, Perla F, Gutiérrez-Quiñantilla R. Attitudes toward masturbation in adolescents: psychometric properties of Spanish version of attitudes toward masturbation inventory. Univ Psychol. (2010) 9:531–42. doi: 10.11144/Javeriana.upsy9-2.amap

49. Malo de. Molina C, Valls Blanco JM, Pérez Gómez A. La conducta sexual de los adolescentes: Estudio Sociológicamente. Barcelona: Ediciones B (1998).

50. Mercer CH, Tanton C, Prah P, Erens B, Sonnенberger P, Clifton S, et al. Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the national surveys of sexual attitudes and lifestyles (NATSAL). Lancet. (2013) 382:1781–94. doi: 10.1016/S0140-6736(13)60305-8

51. Randeloph JF, Zheng H, Avis NE, Greendale GA, Harlow SD. Masturbation frequency and sexual function domains are associated with serum reproductive hormone levels across the menopausal transition. J Clin Endocrinol Metab. (2015) 100:258–66. doi: 10.1210/jc.2014-1725

52. Sierra JC, Gómez-Carranza J, Álvarez-Muelas A, Cervilla O. Association of sexual attitudes with sexual function: General vs. specific attitudes. J Sex Res Public Health. (2021) 18:10390. doi: 10.3980/jep.181910390

53. Peixoto MM, Gomes H, Correia A, Pires I, Pereira T, Machado PP. Translation and validation of the Portuguese version of the sexual desire inventory-2: assessing gender differences. Sex Relat Ther. (2020) 35:89–102. doi: 10.1080/14681819.2019.1692763

54. Álvarez-Media P, Rojas-Paoli I, Álvarez-Muelas A. Validation of the sexual desire inventory in Colombia. J Sex Marital Ther. (2020) 46:385–98. doi: 10.1080/0092623X.2020.1739181

55. Vowels LM, Vowels MJ, Mark KP. Uncovering the most important factors for predicting sexual desire using explainable machine learning. J Sex Med. (2021) 18:1198–216. doi: 10.1016/j.jsxm.2021.04.010

56. Arcos-Romoero AI, Sierra JC. Factors associated with subjective orgasm experience in heterosexual relationships. J Sex Marital Ther. (2020) 34:76. doi: 10.1080/0092623X.2019.1711273

57. Mangas P, Granados R, Cervilla O, Sierra JC. Validation of the orgasm rating scale in context of sexual relationships of gay and lesbian adults. Int J Environ Res Public Health. (2022) 19:887. doi: 10.3390/ijerph19020887

58. Mah K, Binik YM. Are orgasms in the mind or the body? psychosocial versus physiological correlates of orgasmic pleasure and satisfaction. J Sex Marital Ther. (2007) 33:187–200. doi: 10.1080/00926230590513401

59. Arcos-Romoero AI, Moyano N, Sierra JC. Psychometric properties of the orgasm rating scale in context of sexual relationship in a Spanish sample. J Sex Med. (2018) 15:741–49. doi: 10.1016/j.jsxm.2018.03.005

60. Laumann EO, Gagnon JH, Michael RT, Michaels S. The Social Organization of Sexuality: Sexual Practices in the United States. Chicago: University of Chicago press (1994).

61. Rowland DL, Kolha TN, McNabney SM, Uribe D, Hevesi K. Why and how women masturbate, and the relationship to organic response. J Sex Marital Ther. (2020) 46:361–76. doi: 10.1080/0092623X.2020.1717700

62. Mah K, Binik YM. Do all orgasms feel alike? evaluating a two-dimensional model of the orgasm experience across gender and sexual context. J Sex Res. (2002) 39:104–13. doi: 10.1080/0022449029552229

63. Regnerus M, Price J, Gordon D. Masturbation and partnered sex: substitutes or complements? Arch Sex Behav. (2017) 46:2111–21. doi: 10.1007/s10508-017-0975-8

64. Sierra JC, Díaz G, Álvarez-Muelas A, Calvillo C, Granados R, Arcos-Romoero AI. Relación del deseo sexual con la excitación sexual objetiva y subjetiva. Rev Psicopatol Psicol Clin. (2019) 24:173–80. doi: 10.5944/rppc.25374

65. Kelly MP, Strasberg DS, Kircher JR. Attitudinal and experiential correlates of anorgasmia. Arch Sex Behav. (1990) 19:165–77. doi: 10.1007/BF01045230

66. Sierra JC, Valéro-Medina P, Santos-Iglesias P, Lameraz Fernández M. Validation of massachusetts general hospital-sexual functioning questionnaire (MH-SFQ) in a Spanish population. Atención Primaria. (2012) 44:516–24. doi: 10.1016/j.aprim.2012.02.004

67. Tiava IM, Laan ETM, Nobre PJ. Sexual inhibition is a vulnerability factor for orgasm problems in women. J Sex Med. (2018) 15:361–72. doi: 10.1016/j.jsxm.2017.12.015