

The squirt game. Psychosexual characteristics of women experiencing squirting: insights from a case–control study

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Abstract

Background: The psychosexual characteristics of women who report experiencing squirting (Sq)—ie, the copious expulsion of fluid during sexual stimulation, typically coincident with female orgasm, and distinct from other forms of periorgasmic fluids (POF)—have been scarcely investigated.

Aim: To delineate the psychological and sexual functioning profile of women who report the ability to squirt, through the integration of clinical data of enrolled women as well as validated psychosexual assessments and biochemical analysis of POF samples.

Methods: This single-center, cross-sectional, case-control study involved 13 selected women who self-reported the production of POF. Participants completed a comprehensive battery of validated psychometric instruments, including the Female Sexual Function Index (FSFI), Orgasmometer-F, Body Uneasiness Test (BUT), Middlesex Hospital Questionnaire, Attachment Style Questionnaire, and the Sexual Inhibition-/Sexual Excitation Scale (SIS/SES). Each participant provided POF samples collected at home, which were subjected to biochemical analysis to distinguish Sq from other potential types of POF.

Outcomes: The psychosexual characteristics of the women able to produce Sq were compared with those of a sample of age-matched women unable to produce Sq.

Results: Among the 13 individuals from whom POF samples were obtained, 8 were classified as Sq producers, 4 as exhibiting coital incontinence (CI), and 1 as displaying female ejaculation (FE). Compared to controls, women in the Sq group demonstrated significantly higher scores on the FSFI Total ($P < .001$), as well as in the Desire ($P = .044$), Arousal ($P < .001$), and Lubrication ($P = .013$) subdomains. Additionally, they reported higher scores on the Orgasmometer ($P = 0.008$) and the SES scale ($P = .017$), alongside significantly lower scores on the BUT ($P = .018$) and the Discomfort with Closeness subscale ($P = .017$).

Clinical implications: These findings suggest that women who report Sq may exhibit better overall sexual functioning, more positive body image, and more secure relational attachment. Encouraging open, evidence-based discussions within clinical settings may facilitate more personalized care and contribute to improved sexual well-being.

Strengths and limitations: The use of validated psychometric instruments and the inclusion of a control group enhance the reliability of the findings. However, the small sample size and reliance on self-reported data limit the generalizability of the results.

Conclusion: Women who report Sq appear to exhibit more active psychosexual characteristics than those who do not. Further research with larger and more diverse samples is warranted to validate and expand upon these findings.

Keywords: female sexuality; periorgasmic fluid; squirting; female ejaculation; FSFI.

Introduction

Although less extensively studied than in men, it is well-established that women may report producing a variety of fluids associated with sexual stimulation and, in particular, orgasm.¹ These secretions are typically classified as distinct types of female periorgasmic fluids (POF)—namely, vaginal lubrication, squirting (Sq), female ejaculation (FE), and urine associated with coital incontinence (CI)—based on their differing biochemical composition and volume.^{2–4}

Even though rigorous differentiation of vaginal sexual secretions has only recently become possible, the existence of POF is not a modern discovery. In fact, the production of such fluids during orgasm has been well-documented throughout history. As early as 5th century BC China, historical texts

documented the production of female POF and detailed their nature and origin. These ancient reports specifically identified the anterior vaginal wall as the most sensitive area capable of triggering fluid emission.^{5,6} Similarly, the Kamasutra from India systematically described stages of female arousal and distinguished between vaginal lubrication and Sq. In ancient Greece, both Hippocrates of Kos and Aristotle wrote about female POF production, as did Galen of Pergamon during the Roman Empire.⁵ Later, 17th-century physiologist and anatomist de Graaf provided the first description of the periurethral structure he named the “*prostata foemina*” and made a distinction between vaginal lubrication and FE.⁷

In the late 19th century, the gynecologist Alexander Skene identified the periurethral mucous glands (later named “Skene’s glands”), describing their ducts opening

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alongside the urethral meatus.⁸ In the early 20th century, Gräfenberg documented cases of POF emission during female masturbation, associating this phenomenon with the stimulation of the anterior vaginal wall - a region later popularized as the “G-spot” in his honor.⁹ Contemporary research has since redefined this area as the more anatomically complex clitoral-urethro-vaginal (CUV) area, moving beyond the original “spot” conceptualization.¹⁰

Recent research has enabled both quantitative and qualitative classification of POF. Sq involves the expulsion of a large fluid volume, most commonly occurring during CUV complex stimulation.³ Studies confirm the fluid’s renal origin, with volumes typically ranging from 15 to 100 mL.^{11,12} The appearance is that of a clear, water-like fluid, and the color resembles crystal-clear water. The biochemical profile appears like very diluted renal filtrate: while containing lower concentrations of uric acid, urea, chlorine, and creatinine than urine, it is enriched with small concentrations of prostate-specific antigen (PSA), glucose, and fructose.^{3,12}

Sq represents a distinct phenomenon separate from both FE and CI. CI involves the involuntary release of urine during penetration (penetrative CI) or orgasm (orgasmic CI), typically occurring in women with urinary incontinence or detrusor overactivity.² In contrast, FE produces smaller volumes (a few milliliters) of a semen-like fluid secreted by Skene’s glands (paraurethral glands), characterized by high levels of PSA, glucose, and fructose.^{13,14}

Notably, women’s subjective experiences of Sq have received limited scientific attention to date. Existing reports describe polarized perceptions, with some women characterizing the phenomenon as “a superpower” while others associate it with feelings of shame.^{15–17}

Recent empirical investigations into Sq experiences among young adult women have demonstrated significant associations between this phenomenon and measurable changes in both sexual self-esteem and body image perception.¹⁶ Despite these findings, the scientific literature lacks comprehensive psychosexual assessments of women who experience Sq. Most existing studies either employ qualitative methodologies (yielding results that are difficult to reproduce or compare) or rely on online questionnaires (which preclude verification of the biochemical nature of the POF).

To address these research gaps, this study aims at evaluating both sexual function and psychological profiles in women experiencing Sq through integrated use of validated psychometric tools.

Materials and methods

The study employed a cross-sectional 1:2 case–control design, conducted through a collaboration between the Chair of Endocrinology and Medical Sexology (ENDOSEX) at the University of Rome Tor Vergata and the Andrology, Female Endocrinology and Gender Incongruence Unit of the University of Florence. All participants volunteered without remuneration and provided informed consent prior to enrollment. The study adhered to the ethical principles of the Declaration of Helsinki and its subsequent amendments, with approval granted by the Ethics Committee Area Bassa Centro (Protocol 13 938/OSS).

Participants were recruited through non-probability snow-ball sampling, beginning with an initial group of women who reported experiencing Sq and were identified through clinical

practice. Potential candidates were screened via telephone for inclusion and exclusion criteria prior to formal enrollment. Inclusion criteria required the self-reported ability to produce substantial fluid emission during orgasm and the capacity to provide a sample for collection. Exclusion criteria included inability to provide informed consent, current pregnancy or breastfeeding; uncompensated organic diseases, any diagnosed psychiatric conditions, pre-existing incontinence or other urogynecological pathologies, and concurrent participation in other clinical trials. Following screening, 13 eligible participants were asked to attend the outpatient clinic, provided written informed consent, and were officially enrolled in the study.

The initial phase of the study involved an at-home POF sample collection by participants, following provided protocols. After obtaining POF samples, participants placed them in sterile containers while avoiding contamination with other fluids, then stored them at -20°C in domestic freezers until transport to our laboratory using thermal containers. All cases were instructed to begin sexual stimulation with an empty bladder and to note the timing of POF production. For premenopausal individuals, sample collection was scheduled to avoid potential contamination from menstrual bleeding, and the day of the menstrual cycle at the time of collection was recorded. Participants selected their preferred sexual stimulation method to elicit POF and reported their chosen method post-collection.

POF samples underwent physical and biochemical analysis at the laboratories of the Andrology, Female Endocrinology Unit of the University of Florence in Florence. The assessment included color, pH, specific gravity, and osmolarity, as well as glucose, protein, hemoglobin (Hb), urea, uric acid, and PSA. The collected samples were classified as urine, when produced and collected pre- and post-sexual stimulations, Sq, or FE based on established physical and biochemical parameters (including volume, appearance, and osmolarity) following current scientific consensus.^{1,3} POF samples with low volume (≤ 1.5 mL), thick consistency, and a whitish color were categorized as FE, whereas fluids with higher volume (> 1.5 mL) and a thin and transparent appearance were classified as urine or Sq. To differentiate urine (resulting from CI) from Sq fluid, in addition to classical physical characteristics (such as the absence of color and odor in Sq versus the typical yellowish color and odor of urine), osmolarity was also taken into account. Sq accumulates in the urinary bladder following renal filtration and exhibits distinct biochemical properties, primarily due to extreme dilution. In particular, fluids were classified as Sq (extremely hypotonic renal filtrate) when demonstrating osmolarity values below 300 mOsm/kg, consistent with established diagnostic thresholds for water diuresis, which is characterized by excessive free water excretion.¹⁸

In addition, participants were asked to collect 2 urine samples: the first one before intercourse, as close as possible to the beginning of sexual stimulation (pre-stimulation urine), and the second after orgasm (post-stimulation urine), as soon as intercourse ended. These samples were stored and transported using the same procedures as the POF sample and underwent biochemical urinalysis, including an evaluation of osmolarity. Subjects whose pre-stimulation urine samples showed an osmolarity below 300 mOsm/kg (indicating extreme dilution) were classified as a distinct subset of individuals reporting Sq, in whom stimulation was likely—although not openly

declared—preceded by excessive water intake. Polyuria/polydipsia syndromes were excluded in all cases based on patient history, which encompassed documented normal daily fluid intake and normal 24-hour urine output (<50 mL/kg body weight).

Being the aim of this study psychosexual in nature, more data on the biochemical characteristics of the collected fluids will be given in another dedicated report.

During outpatient clinic visits, we collected sociodemographic and clinical parameters from all participants. A dedicated interview was conducted by an expert in sexual medicine to explore the attitudes of the subjects—as well as those (referred) of their partner(s)—regarding Sq, FE, and their overall attitude toward sexual life. All volunteers were also administered a series of psychometric questionnaires, including: the Female Sexual Function Index (FSFI), a 19-item self-report questionnaire designed to assess sexual function in women, covering 6 domains (desire, arousal, lubrication, orgasm, satisfaction, and pain), with a total score ≤ 26.5 being suggestive of clinical sexual dysfunction^{19,20}; the Female Sexual Distress Scale-Revised (FSDS-R), a 13-item questionnaire that measures sexually-related personal distress in women, often used in conjunction with the FSFI to assess the emotional impact of sexual dysfunction on a woman's life²¹; the Body Uneasiness Test (BUT), a psychometric test used to assess body image dissatisfaction and related concerns²²; the Middlesex Hospital Questionnaire (MHQ), a self-report questionnaire that measures neurotic symptoms across 6 dimensions (free-floating anxiety, depression, obsessive symptoms, phobic anxiety, somatic symptoms, and hysteria), widely used in clinical settings to assess general psychological distress²³; the SIS-SES-W (Sexual Inhibition/Sexual Excitation Inventory for Women), a measure designed to assess sexual inhibition (SIS) and Sexual Excitation Scale (SES) in women and to evaluate how different psychological factors might inhibit or excite sexual arousal and behavior^{24,25}; the Attachment Style Questionnaire (ASQ), to assess adult attachment styles (secure, anxious, and avoidant) based on the theory that early attachment experiences influence relationships in adulthood^{26,27}; and the Orgasmometer-F, a well validated tool constructed on the well-known Visual Analog Scale for pain, to rate from 0 (absence) to 10 (maximum intensity) the intensity of orgasm.²⁸ Finally, sexual identity, as the result of the interaction between biological sex, gender identity, and sexual orientation, has been studied by XYGO, a dedicated psychometric tool.²⁹

A control group of 26 women who reported never experiencing the production of POF was recruited from patients presenting at the Female Endocrinology Unit of AOU Careggi for contraceptive needs. The case and control groups were matched for age, menopausal status, and body mass index. Exclusion criteria included the presence of any sexual dysfunction, as indicated by a total FSFI score of ≤ 26.5 , inability to provide informed consent, current pregnancy or breastfeeding, uncompensated organic diseases, any diagnosed psychiatric conditions, pre-existing incontinence or other urogynecological pathologies. All selected controls completed the same psychometric battery as the POF-reporting group. The average time to complete the full battery of psychometric tests was 15 ± 5 minutes for both groups.

Comparative analyses between cases and controls were conducted in 2 stages: first, by comparing all women who reported POF with the 26 controls; and subsequently, by

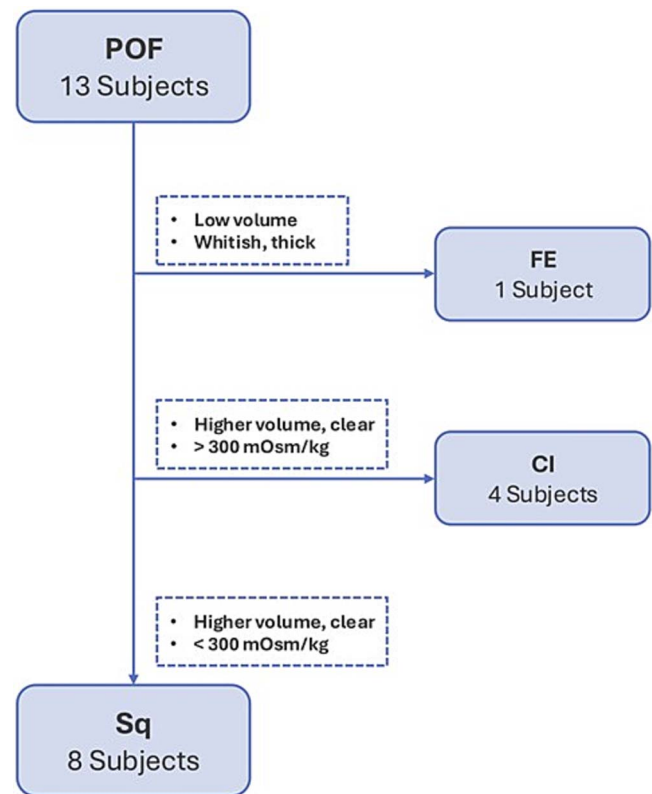


Figure 1. Classification flowchart of the periorgasmic fluids obtained. POF = Periorgasmic fluid; FE = female ejaculation; CI = coital incontinence; Sq = squirting.

including only the women in whom biochemical analysis confirmed the presence of Sq, compared with a reduced control group (randomly excluding a number of subjects from the original control group to maintain a 1:2 case-to-control ratio).

Statistics were performed with SPSS 26.0 for Windows, and the data is expressed as mean $\pm$ standard deviation when normally distributed and as median (quartiles) when not normally distributed. To compare normally and non-normally distributed continuous variables between 2 independent groups, Student's *t*-test and Mann-Whitney test were used, respectively. For comparison between groups of categorical variables, the Chi-square test was used. Multivariate analyses were performed by analysis of covariance or logic regression. Statistical significance was set at a *P*-value of $< .05$.

Results

All 13 cases enrolled in the study provided a sample of POF. The volume of fluid was highly variable, ranging from 1.3 to 140.0 mL, with a median of 15.0 mL (interquartile range: 10.6–33.3 mL). Based on the physical and biochemical characteristics described in the Materials and Methods section, 4 samples were categorized as resulting from CI, 1 as resulting from FE, and 8 as resulting from Sq (Figure 1). Of the 8 subjects exhibiting Sq (ie, a highly diluted POF), the vast majority had normally concentrated pre-stimulation urine, while 2 subjects had pre-stimulation urine with osmolarity below the normal range (<300 mOsm/kg).

The cases collected the samples following different types of sexual stimulation and at different stages of their menstrual

Table 1. Sociodemographic and clinical characteristics of women reporting periorgasmic fluid (POF) emission (cases) and controls. The 2 groups were matched for age, menopausal status, and body mass index (BMI). Statistical significance refers to the unadjusted differences between the 2 groups. BMI = body mass index; WC = waist circumference.

	Cases (<i>n</i> = 13) (women with POF)	Controls (<i>n</i> = 26) (women w/o POF)	<i>P</i>
Age, years	36.4 ± 10.9	36.9 ± 11.2	.887
Menopausal status, % (<i>n</i>)	15.4 (2)	26.9 (7)	.353
BMI, kg/m ²	24.9 ± 8.7	23.9 ± 4.2	.642
WC, cm	78.5 ± 33.9	89.1 ± 12.9	.180
Physical activity, % (<i>n</i>)	46.1 (6)	53.8 (14)	.255
Smoking, % (<i>n</i>)	46.1 (6)	19.2 (5)	.110
Alcohol, % (<i>n</i>)	53.8 (7)	19.2 (5)	.080
Drugs, % (<i>n</i>)	38.5 (5)	7.7 (2)	.050
Graduated, % (<i>n</i>)	61.5 (8)	23.1 (6)	.023
Stable relationship, % (<i>n</i>)	76.9 (10)	69.2 (18)	.525
Religious, % (<i>n</i>)	46.2 (6)	84.6 (22)	.017
• Catholic, % (<i>n</i>)	0 (0)	100 (26)	.017
Sexual orientation			
• Heterosexual, % (<i>n</i>)	69.2 (9)	96.1 (25)	.035
• Bisexual, % (<i>n</i>)	30.7 (4)	3.9 (1)	
• Homosexual, % (<i>n</i>)	0.0 (0)	0.0 (0)	

cycle. As reported, some induced POF through clitoral stimulation using fingers or sex toys, others through oral sex, and others through penetrative intercourse and subsequent vaginally activated orgasm.³⁰ Six samples were collected during days 5-14 of the menstrual cycle, 3 during days 15-28, and 2 participants from the case group were postmenopausal. Interestingly, volunteers reported Sq production both during arousal and orgasm, with 1 participant producing Sq in both phases during the same sexual response cycle. Unanimously, Sq production was reported as associated with a high perceived intensity of orgasm: 2 volunteers described sexual intercourse as “deeper”, 1 as “an apex that only happens when I squirt”. The others described, more generically, a better orgasm and post-orgasmic fulfillment associated with Sq production compared to the absence of POF.

Table 1 shows the sociodemographic and clinical characteristics of the 13 cases reporting POF and of the relative control group. Mean age was 36.4 ± 10.9 years, and 15.4% (*n* = 2) were postmenopausal. 10 women (76.9%) reported being engaged in a stable relationship, and 9 (69.2%) reported being heterosexual. Table 2 shows the sociodemographic and clinical characteristics of the subgroup of 8 subjects presenting biochemically confirmed Sq. Mean age was 40 ± 12.6 years, and 25% (*n* = 2) were postmenopausal. Seven women (87.5%) reported being engaged in a stable relationship, and 4 (50%) reported being heterosexuality. Either the case group of total women presenting POF (*n* = 13) or the case subgroup of Sq women (*n* = 8) were more likely to be graduated and bisexual and less likely to be religious (in particular, Catholic) as compared with the respective control groups (Tables 1 and 2).

Regarding sexual parameters, women with POF showed significantly higher scores in the FSFI Total (*P* < .001), Arousal (*P* < .001), and Lubrication (*P* = .004) domains, as well as higher scores on the Orgasmometer (*P* = 0.011) and the SES (*P* = .031), compared to controls, indicating better sexual function. With respect to psychological parameters, women with POF exhibited lower scores in MHQ somatoform anxiety (*P* = .005), higher levels of Histrionic/Hysterical

traits (*P* = .031), and lower scores in Discomfort with Closeness (*P* = .004) (Table 3). Among these differences, those that remained statistically significant after adjustment for confounding factors (including religious affiliation, educational attainment, and sexual orientation) were the FSFI Total and Arousal scores, as well as Intimacy Discomfort (Table 3).

When considering the subgroup of women presenting Sq, they showed significantly higher scores in the FSFI Total (*P* < .001), Desire (*P* = .044), Arousal (*P* < .001), and Lubrication (*P* = .013) domains, as well as on the Orgasmometer (*P* = .008) and the SES (*P* = .017), indicating a more effective sexual function compared to controls. With respect to psychological evaluation, women able to Sq exhibited lower MHQ somatoform anxiety (*P* = .011), higher levels of Histrionic/Hysterical traits (*P* = .025), lower scores on the BUT-A Global Severity Index (*P* = .018), and reduced Discomfort with Closeness (*P* = .017) (Table 4). Among these differences, those that remained statistically significant after adjustment for the same confounding factors mentioned earlier were the FSFI Total score and the Orgasmometer (Table 4).

The psychological and psychosexual characteristics of the 2 subjects with reduced pre-stimulation urine osmolality were compared to those of the other women who reported Sq. No significant differences were found between the groups (data not shown).

Finally, when investigating the possible correlations between fluid volume and other parameters, we found no correlation with age, menopausal status, or sexual response parameters, as evaluated by the FSFI Total score or the Orgasmometer (data not shown).

Discussion

The aim of this study is to characterize the psychosexual profile of women capable of producing POF, with particular emphasis on those reporting the ability to squirt, and to compare them with sexually healthy, age-matched women

Table 2. Sociodemographic and clinical characteristics of women reporting squirting (Sq) and controls. Ten subjects were randomly excluded from the original control group in order to maintain a 1:2 case-to-control ratio. Statistical significance refers to the unadjusted differences between the 2 groups. BMI = body mass index; WC = waist circumference.

	Cases (<i>n</i> = 8) (women with Sq)	Controls (<i>n</i> = 16) (women w/o Sq)	<i>P</i>
Age, years	40.0 ± 12.6	38.9 ± 12.4	.846
Menopausal status, % (<i>n</i>)	25 (2)	37.5 (6)	.447
BMI, kg/m ²	22.4 ± 3.5	22.4 ± 2.8	.991
WC, cm	79.4 ± 8.2	85.3 ± 10.5	.237
Physical activity, % (<i>n</i>)	62.5 (5)	62.5 (10)	.510
Smoking, % (<i>n</i>)	50.0 (4)	18.7 (3)	.182
Alcohol, % (<i>n</i>)	50.0 (4)	31.2 (5)	.605
Drugs, % (<i>n</i>)	50.0 (4)	6.2 (1)	.028
Graduated, % (<i>n</i>)	87.5 (7)	18.7 (3)	.002
Stable relationship, % (<i>n</i>)	87.5 (7)	62.5 (10)	.656
Religious, % (<i>n</i>)	50.0 (4)	87.5 (14)	.069
• Catholic, % (<i>n</i>)	0 (0)	100 (14)	<.001
Sexual orientation			
• Heterosexual, % (<i>n</i>)	50.0 (4)	93.7 (15)	.028
• Bisexual, % (<i>n</i>)	50.0 (4)	6.2 (1)	
• Homosexual, % (<i>n</i>)	0.0 (0)	0.0 (0)	

Table 3. Comparison of sexuological and psychological questionnaire scores between women reporting periorgasmic fluid (POF) emission and controls. *P** refers to a multivariate model of logistic binary regression, after adjustment for being religious, being graduated, and sexual orientation (heterosexual vs other). FSFI = Female Sexual Function Index. FSDS-R = Female Sexual Distress Scale, Revised. SIS1 = Sexual Excitation Scale. SES = Sexual Excitation Scale. MHQ = Middlesex Hospital Questionnaire. BUT = Body Uneasiness Test. ASQ = Attachment Style Questionnaire.

	Cases <i>n</i> = 13 (women with POF)	Controls <i>n</i> = 26 (women w/o POF)	<i>P</i>	<i>P</i> *
FSFI Total	33.51 ± 1.37	30.67 ± 2.32	<.001	.040
FSFI Desire	4.75 ± 0.83	4.17 ± 0.95	.081	—
FSFI Arousal	5.90 ± 0.19	5.00 ± 0.61	<.001	.027
FSFI Lubrication	5.92 ± 0.18	5.31 ± 0.97	.004	.178
FSFI Orgasm	5.76 ± 0.43	5.35 ± 1.06	.203	—
FSFI Satisfaction	5.37 ± 0.97	5.52 ± 0.69	.572	—
FSFI Pain	5.80 ± 0.47	5.31 ± 1.23	.084	—
FSDS-R	7.0 ± 10.0	6.19 ± 8.25	.795	—
Orgasmometer	8.91 ± 0.54	6.92 ± 1.57	<.001	.062
SIS1 Inhibition Failure	28.83 ± 6.06	31.67 ± 7.00	.333	—
SIS2 Inhibition Consequences	28.91 ± 5.61	31.55 ± 9.94	.449	—
SES	57.67 ± 7.61	47.67 ± 12.04	.031	.051
MHQ Total	26.25 ± 12.14	31.44 ± 10.81	.197	—
MHQ Anxiety	6.50 ± 3.45	6.72 ± 3.37	.855	—
MHQ Phobia	3.75 ± 2.53	5.20 ± 2.10	.074	—
MHQ OC Traits	4.00 ± 2.69	5.52 ± 2.95	.140	—
MHQ Somatization	1.83 ± 1.40	4.00 ± 3.01	.005	1.190
MHQ Depression	3.33 ± 2.64	5.04 ± 3.23	.121	—
MHQ Hysteric/Histrionic Traits	6.83 ± 2.08	4.96 ± 2.49	.031	.338
BUT-A Global Severity Index	0.61 ± 0.54	1.15 ± 1.04	.154	—
ASQ confidence	34.08 ± 8.92	34.42 ± 6.04	.916	—
ASQ Discomfort with Closeness	26.83 ± 8.93	37.92 ± 6.93	.004	.035
ASQ Relationships as Secondary	9.25 ± 2.70	12.17 ± 4.78	.079	—
ASQ Need for Approval	14.09 ± 4.18	15.67 ± 5.39	.446	—
ASQ Preoccupation with Relationships	23.54 ± 8.16	23.91 ± 6.86	.911	—

who self-identify as unable to produce any POF. To our knowledge, this is the first study that reports data from validated psychometric instruments in subjects stratified based on the biochemical nature of POF.

Our findings suggest that women reporting the production of POF/Sq exhibit significantly better overall sexual function compared to those who have never reported the

emission of POF. Specifically, they demonstrated higher levels of arousal, lubrication, orgasmic intensity, and scored higher in domains related to sexual excitation. Additionally, these women reported other specific psychological and psychosexual traits compared to controls, such as lower levels of discomfort with intimacy and reduced body image dissatisfaction. Furthermore, women reporting the production

Table 4. Comparison of sexuological and psychological questionnaire scores between women reporting Squirting (Sq) and controls. *P** refers to a multivariate model of logistic binary regression, after adjustment for being religious, being graduated, and sexual orientation (heterosexual vs other). FSFI = Female Sexual Function Index. FSDS-R = Female Sexual Distress Scale, revised. SIS1 = Sexual Excitation Scale. SES = Sexual Excitation Scale. MHQ = Middlesex Hospital Questionnaire. BUT = Body Uneasiness Test. ASQ = Attachment Style Questionnaire.

	Cases <i>n</i> = 8 (women with Sq)	Controls <i>n</i> = 16 (women w/o Sq)	<i>P</i>	<i>P</i> *
FSFI Total	33.86 ± 1.46	29.89 ± 1.94	<.001	.003
FSFI Desire	4.95 ± 0.77	4.01 ± 1.11	.044	.201
FSFI Arousal	5.85 ± 0.23	4.89 ± 0.67	<.001	.231
FSFI Lubrication	5.96 ± 0.11	5.14 ± 1.16	.013	.701
FSFI Orgasm	5.75 ± 0.48	5.17 ± 1.28	.238	-
FSFI Satisfaction	5.50 ± 0.63	5.45 ± 0.78	.876	-
FSFI Pain	5.85 ± 0.42	5.22 ± 1.28	.093	-
FSDS-R	5.43 ± 10.61	7.62 ± 8.05	.613	-
Orgasmometer	9.00 ± 1.07	7.00 ± 1.78	.008	.011
SIS1 Inhibition Failure	28.86 ± 5.96	31.00 ± 7.17	.471	-
SIS2 Inhibition Consequences	25.86 ± 4.52	31.25 ± 10.58	.387	-
SES	58.25 ± 7.04	45.62 ± 11.08	.017	.108
MHQ Total	27.25 ± 13.45	29.87 ± 8.10	.564	-
MHQ Anxiety	6.00 ± 3.29	6.00 ± 2.48	1.000	-
MHQ Phobia	4.00 ± 2.83	5.00 ± 1.65	.293	-
MHQ OC Traits	4.38 ± 3.20	5.67 ± 3.31	.378	-
MHQ Somatization	1.38 ± 0.92	3.87 ± 3.14	.011	.831
MHQ Depression	3.88 ± 2.64	4.73 ± 2.46	.446	-
MHQ Hysteric/Histrionic Traits	7.13 ± 2.03	4.60 ± 2.56	.025	.486
BUT-A Global Severity Index	0.32 ± 0.37	1.06 ± 0.99	.018	.924
ASQ Confidence	36.62 ± 3.20	34.64 ± 6.28	.425	-
ASQ Discomfort with Closeness	28.37 ± 7.78	37.00 ± 6.47	.017	0.261
ASQ Relationships as Secondary	9.50 ± 2.98	12.09 ± 5.01	.211	-
ASQ Need for Approval	15.25 ± 4.27	15.46 ± 5.61	.932	-
ASQ Preoccupation with Relationships	24.62 ± 9.19	24.20 ± 7.16	.913	-

of POF seem less anxious, more at ease with their body and comfortable being close to other people.

Several sociodemographic characteristics (eg, religious background) and lifestyle habits (eg, drug use) differed significantly between the 2 groups. However, it should be noted that these differences might stem from the specific type of sampling rather than reflecting genuine differences between cases and controls. Nonetheless, they may still potentially act as confounding factors influencing the sexual outcomes.

Women in the POF/Sq group were less likely to identify as religious (particularly Catholic), had higher levels of education, and were more frequently bisexual compared to controls. While the relationship between religiosity and sexual function remains complex, prior research has found associations among high religiosity and more conservative sexual attitudes, fewer sexual experiences, and less engagement in non-procreative sexual behaviors.^{31,32} Conversely, higher education often predicts improved sexual satisfaction, likely due to greater sexual literacy, communication skills, and a stronger sense of self-knowledge.³³

Sexual orientation also appears to play a role: bisexual women have been shown to report higher sexual sensation-seeking and curiosity compared to heterosexual and lesbian women, which may correlate with distinct aspects of sexual function.³⁴ The greater prevalence of bisexual women among those reporting Sq is consistent with previous findings, which indicate that women with non-heterosexual orientations are more likely to have experienced FE and/or Sq than heterosexual women.³⁵ This could be due to increased openness to diverse sexual practices and more positive attitudes toward sexual exploration.³⁶ Additionally, sexual activity between

women may involve a greater use of manual stimulation and digital penetration—forms of stimulation more commonly associated with Sq. Although some women report Sq in response to external clitoral stimulation alone, existing data suggest that anterior vaginal, or CUV complex, stimulation is more frequently associated with the occurrence of Sq.^{3,12}

Even after adjusting for confounders, our results consistently showed a more effective sexual functioning as indicated by a higher FSFI score among women reporting POF/Sq. This may reflect a reinforced positive psychosexual feedback loop: the enhanced sexual self-confidence and psychological comfort surrounding the experience of Sq may have contributed to its association with a fulfilling sexual experience—an association that, in turn, could have positively influenced levels of arousal and pleasure.³⁷ It is notable that participants voluntarily enrolled in this study without financial compensation, suggesting a degree of comfort and even pride regarding their sexual experiences. Anecdotal reports from participants support this; in fact, 1 woman began experiencing Sq in her forties through tantric sex and yoga practices, while others referenced women's groups focused on body awareness and sexual empowerment reminiscent of Betty Dodson's work.^{38,39}

Women in the POF group also reported significantly lower levels of intimacy-related discomfort, even when controlling for potential confounders. This finding aligns with the idea that sexual well-being is intertwined with emotional and relational security. Importantly, the psychological experience of Sq is heavily influenced by a partner's response. Supportive and affirming reactions may deepen intimacy and enhance

confidence, whereas dismissive or mocking attitudes can lead to shame or inhibition.^{15,16} Open communication between partners is therefore critical in shaping healthy and positive sexual experiences involving Sq.

Previous research found no significant difference in psychological satisfaction with sex between women who reported ejaculation and those who did not.⁴⁰ However, these early studies did not distinguish between FE and Sq—a classification established in 2011³ and subsequently confirmed^{1,41}—which may account for the discrepancy with our findings. In contrast, our results are consistent with those of a large international online survey involving 340 women, which examined the perceived impact of fluid emission during sexual activity on the sexual lives of both the women and their partners.¹³ More than three-quarters of respondents characterized this phenomenon as an “enrichment” of their sexual experience, while only a negligible minority viewed it as pathological. Similar perceptions have been attributed to the partners of women who experienced fluid emissions, with the vast majority regarding it as a positive element in the couple’s sexual relationship.

In addition to exhibiting better overall sexual function, women reporting Sq also demonstrated significantly higher orgasmic intensity compared to controls—even after adjusting for confounders—as measured, for the first time, using scores from the Orgasmometer-F,²⁸ a unique, dedicated, and validated psychometric tool designed to assess the intensity of female orgasm.

This evidence is only partially consistent with findings from an elegant and insightful U.S. probability-based study involving 3017 women aged 18–93, in which approximately 40% reported having ever squirted in their lifetime, and about 60% of those described the experience as very or somewhat pleasurable.⁴² The observation that only 20% “always” experienced Sq in conjunction with orgasm appears to contrast with our smaller sample, in which all participants reported the presence of orgasm. This discrepancy may be attributable to fundamental differences in study design—online versus in-person, real-world versus case-control—as well as differences in participant stratification based on POF biochemistry, and the participants’ motivations for engaging in the respective studies.

The fact that fluid emission during sexual activity can occur independently of orgasm^{15–17,35,42} does not definitively demonstrate that FE/Sq are unrelated to pleasure. Rather, it suggests that women may find it challenging to accurately interpret the nature and biochemistry of the emitted fluids, and consequently, to evaluate the sexual experience. For example, a meta-analysis of 132 peer-reviewed or academically reviewed laboratory studies examining the correlation between self-reported and genital measures of sexual arousal (involving 2505 women and 1918 men) revealed a pronounced gender difference in concordance. Men exhibited a significantly higher correlation ($r=0.66$) compared to women ($r=0.26$) between subjective and physiological arousal.⁴³ However, when orgasm co-occurs with the emission of POF, as observed in our sample, this may influence the subjective perception of the experience as more pleasurable.³⁵

While our findings may be partially influenced by the previously discussed aspects of sexual empowerment, they also warrant consideration from a biological standpoint. Orgasmic pleasure is partly mediated by rhythmic contractions of the pelvic floor, which also appear to be involved in the expulsion

of POF. Neuroimaging studies have implicated the ventrolateral pontine region in the control of pelvic floor contractions during orgasm.⁴⁴ These contractions, which involve the pubococcygeus and other pelvic floor muscles, increase in intensity during the initial phase of orgasm and taper off as the series progresses, and their rhythm and strength correlate with the subjective experience of orgasm intensity.⁴⁵ On the other hand, women able to ejaculate were found to have significantly stronger pubococcygeal muscle contractions and significantly stronger uterine contractions than those who are not.⁴⁶ Women capable of Sq may indeed demonstrate stronger pelvic musculature or heightened sensory pathways, contributing to more intense orgasms, but this hypothesis needs further data to be confirmed.

Our findings also revealed that cases who reported Sq exhibited lower body image dissatisfaction and related concerns, fewer somatic concomitants of anxiety, and higher hysterical personality traits. Furthermore, these women reported less discomfort with intimacy and dependence on others. A direct comparison with existing literature is not possible, as, to our knowledge, this is the first study to assess these specific psychological characteristics using validated instruments in a population reporting Sq.

Nevertheless, some of these dimensions have been examined in relation to sexuality more broadly, offering meaningful points of reflection. Several studies have consistently shown that women with greater body satisfaction or self-acceptance experience higher levels of sexual desire, arousal, orgasmic capacity, and overall sexual satisfaction compared to those with negative or dissatisfied body image.^{47,48} In the context of our findings, this relationship can be interpreted in 2 ways: women with a healthier and more positive relationship with their bodies may be more accepting of POF emission and more open to exploring practices such as Sq; conversely, engaging in and accepting such practices may, in turn, contribute to a more positive body image and self-perception.

Other research suggests that insecure attachment—particularly the avoidant style, which is often marked by heightened discomfort with closeness—is associated with various impairments in female sexual functioning, including reduced arousal, satisfaction, and orgasmic ability.^{49,50} Avoidantly attached individuals may struggle to develop emotional intimacy and vulnerability, potentially leading to sexual dissatisfaction. From this perspective, the observation that women reporting Sq experience less discomfort with closeness may suggest that a greater ability to develop emotional intimacy with a partner could be an important factor in facilitating the experience of Sq as a means to enhance sexual pleasure.

Finally, it is important to note that the correlations discussed above did not remain statistically significant after adjusting for confounding variables. This suggests that sociodemographic factors—such as religiosity, education level, and sexual orientation—may play a substantial role in shaping these associations.

Two women in the Sq group showed pre-stimulation urine osmolality values indicative of extreme dilution. In the absence of other clinical signs consistent with a polyuric/polydipsic syndrome, these findings strongly suggest a high-water intake prior to sexual stimulation. The role of water intake in women who produce Sq is little investigated, with no evidence in the literature that women who produce Sq consume particularly large amounts of water before sex.

However, considering that hydration might influence the volume of fluid expelled during Sq, it cannot be ruled out that at least a small subset of these women may feel the need to hydrate extensively prior to stimulation in order to facilitate the phenomenon and to enhance pleasure. Notably, in the traditional practice of Kunyaza (a sexual technique aimed at triggering peri-orgasmic fluid production), women are taught to hydrate extensively and consume foods high in water content to facilitate the fluid production.³⁶ One case report documented a daily water intake exceeding 3 liters, sourced from both water and fruits.³⁶ This hypothesis appears to align with the findings of Hensel et al., in which a significant proportion of participants reported the need to “prep and warm up to squirt”.⁴² It remains to be determined how often such preparation involves increased fluid intake.

When comparing the 2 subjects with high water intake before stimulation to the remaining women with Sq, the small sample size of the groups may potentially jeopardize the reliability of the data. Despite these limitations, the results suggest that these women do not exhibit a distinctive psychosexual profile, making it less likely that this behavior reflects, for example, an indicator of social desirability (ie, women in a performance-oriented mindset who prepared themselves by drinking more water than usual). Indeed, upon this little evidence, we are now following a new path of research, exploring if squirters drink large amounts of water before the sexual sessions, how frequently, and the motivation for this behavior.

Overall, the current findings suggest that clinicians should consider the broader psychosexual context when evaluating women who report POF and Sq. The presence of these phenomena, along with the comfort in disclosing them, may reflect enhanced sexual functioning, positive body image, and secure relational dynamics. Medical professionals, sex therapists, and educators should provide accurate, non-stigmatizing information about Sq, empowering women to understand their bodies without shame. This includes promoting evidence-based knowledge and fostering a culture of sexual literacy and body awareness. Simultaneously, experts in sexual medicine should actively work to dispel myths and misconceptions (many of which are perpetuated or distorted by mainstream pornography) that portray Sq as indicative of a heightened or superior orgasmic experience or identify FE/Sq as the sole marker of “true” orgasm. Such reductionist interpretations risk oversimplifying the complex, multifactorial nature of female sexual response and may contribute to unrealistic expectations and performance-related anxiety.

Further research should employ longitudinal designs to examine causality while expanding sample size to improve generalizability. Furthermore, new research should incorporate partner reports and couple-based assessments to evaluate relational dynamics and explore the role of cultural, religious, and gender identity variables in shaping Sq experiences. Despite the need for further and larger research, this study also highlights new directions for exploring the relationship between female POF production and psychosexual well-being.

Limitations and strengths

This study has some limitations that should be taken into consideration. First, recruitment was conducted via snowball sampling—a non-probabilistic method that may

introduce bias by concentrating participants within socio-cultural networks more open or positive toward sexuality. Additionally, participants’ voluntary enrollment may reflect a selection bias favoring individuals with greater sexual confidence or empowerment, potentially excluding those who experience POF/Sq with discomfort or distress. The relatively small sample size, an issue frequently seen in published reports dealing with Sq and/or FE, limits statistical power and generalizability. Furthermore, the cross-sectional design prevents causal inference. Another limitation lies in the reliance on self-collected biological samples. Despite careful instructions and appropriate transport conditions, the risk of contamination cannot be fully excluded. However, this methodology was necessitated by ethical and practical considerations, as clinical collection of POF is both invasive and potentially distressing for participants. Self-reported information is another limitation of the study, inherent to the nature of sexual quality of life and satisfaction.

Nonetheless, the study also presents significant strengths. It is, to date, the only study to combine a comprehensive battery of validated psychometric instruments with biochemical verification of POF in a matched control design. This dual approach allows for a more nuanced differentiation between types of POF and offers a clearer understanding of the physiological and psychological dimensions of the phenomenon.

Conclusion

This study offers preliminary evidence that women who squirt present a distinctive psychosexual profile, characterized by high sexual functioning, strong genital and orgasmic responsiveness, a positive body image, and secure relational attachment. When accepted and experienced in a positive light, Sq may represent an embodied expression of sexual well-being and an integrative physiological response. Clinicians and researchers alike should reframe the narrative around Sq, from one of curiosity or shame to one of clinical relevance, sexual autonomy, and psychosexual health.

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Author contributions

E.M.: Formal analysis-Equal, Investigation-Equal. F.P.: Data curation-Equal. D.Y.: Formal analysis-Equal, Methodology-Equal, Writing—original draft-Equal. S.C.: Data curation-Equal. S.A.R.: Data curation-Equal. M.M.: Supervision-Equal. L.V.: Supervision-Equal. E.A.J.: Conceptualization-Lead, Resources-Equal, Supervision-Equal, Writing—original draft-Equal, Writing—review & editing-Equal. Elisa Maseroli and Fiorenza Pesce contributed equally to this work.

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Conflicts of interest

E.A.J. is or has been a consultant and/or paid speaker for Bayer, FQM, Ibsa, Kanna, Lundbeck, Menarini, Merck, Mia, Otsuka, Pfizer, Recordati, Shionogi, and Viatrix. The other authors declare no competing interests.

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