

Female Sexual Function in Castilla Y Leon (Spain): Normal Ranges

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Abstract

We hypothesized that the application of Rosen's Female Sexual Function Index (FSFI[®]) in a Spanish population differs from the results published in the United States population.

Material and methods: We conducted an observational epidemiological study of female sexual function in the population of Castilla y Leon (Spanish region) involving 4500 women and we determined their "normality" in order to achieve nine diagnostic cut-off points for female sexual dysfunction for our community overall and by decade of age.

Results: We developed a new, general specific cut-off point to diagnose sexual dysfunction in our female population, FSFI[®] \leq 21.7; bearing in mind that female sexual dysfunction is age-dependant, we obtained new cut-off points for the diagnosis of female sexual dysfunction by decade of age.

Conclusion: Given the different sociocultural characteristics of populations, we must not assume certain diagnostic sexual dysfunction parameters as generalized worldwide standards.

Keywords: Cut-off point; Female sexual dysfunction; Female sexual function index; Spain

Abbreviations: DSM-V: Diagnostic and Statistical Manual of Mental Disorders; FSFI[®]: Female Sexual Function Index; SD: Standard Deviation; yr: Years; P25: Percentile 25

Introduction

Any approach to human sexuality requires observing each and every concept. It is the only way of not partializing, decontextualizing, or even dehumanizing the approach of difficulties in this field. The human erotic experience is among the most psychosomatic experiences; therefore, its psychophysiological and organic bases in their integrity are also decisive for understanding sexual dysfunctions [1].

Sexual behavior is one of the most important-but not the only one-manifestation of our sexuality. It involves, together with a complex interaction of intra-psychical, interpersonal, and social factors intervening in its initiation and maintenance, a characteristic psychophysiological expression, a set of physical and mental changes that make up the so-called sexual response, as coined by Masters and Johnson [2].

The most characteristic physiological changes occur in the genitalia, even when it is a matter of fact that the sexual response involves the body in its entirety. All of our organs and systems modify their functional status to different degrees during the sexual response. The complexity of the sexual response makes it require a particularly healthy body for an effective and pleasant development. For that reason, many body disorders of different natures may negatively affect a satisfactory sexual response [3].

Sexual response is usually described schematically as a cyclic sequence of characteristic stages or phases that facilitate, reinforce, or inhibit each other [4]. In 1966, Master and Johnson [2] first described female sexual response, which consists of excitement, plateau, orgasm, and resolution (both physiological and psychological).

Several axes of human physiology are necessary to control the sexual response: the anatomical and psychological scopes as well as the nervous system and-mainly-the hormonal regulation; any anomaly in any of them will result in sexual dysfunction.

Sexual dysfunctions are characterized by psychophysiological

changes in the sexual response cycle and by the onset of a personal discomfort and interpersonal problems.

In October 1998, it was build up a consensus group of 19 pelvic floor dysfunction experts from five countries gathered at a meeting organized by the American Foundation of Urologic Disease (AFUD). These experts belonged to the fields of endocrinology, family medicine, gynecology, nursing, pharmacology, physiology, psychiatry, psychology, rehabilitation, and urology. The goal of the group was to evaluate and review the existing definitions in the field of female sexual dysfunction [5].

It is important to bear in mind that the notions of deviation of normality, of sexual function standards and of the concepts of an appropriate sexual role, may vary in different cultures [5,6].

There is very little systematic epidemiological data about the prevalence of different sexual disorders and it shows great variability, which might be due to the different assessment methods used, the definitions described, and the characteristics of the population studied. Thus we find that randomized, community-based, correctly-designed epidemiological studies on female sexual dysfunction are limited [4].

Data from the United States population census show that 9.7 million US women between 50 and 74 years of age complained about decreased excitement, dyspareunia, and difficulty to reach orgasm. The incidence of female sexual dysfunction-related complaints increases with ageing, menopause, and various medical risks [7].

Classification of Female Sexual Dysfunctions by the DSM-V (Diagnostic and Statistical Manual of Mental Disorders) [6]:

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1. Female sexual interest/arousal disorder
2. Female orgasmic disorder
3. Genito-pelvic pain/penetration disorder
4. Unspecified sexual disorder

The objectives of this study were to determine that the application of Rosen's Female Sexual Function Index (FSFI®) in a Spanish population differs from the results published in the United States population, and develop a new, general specific cut-off point to diagnose sexual dysfunction in our Spanish female population and the cut-off points for the diagnosis of female sexual dysfunction by decade of age.

Material and Methods

We have developed an observational, cross-sectional descriptive study with women of Castilla y Leon (Spanish Autonomous Community). The population for this study was randomly selected from 4,500 women, after stratifying by province and age, from the SACYL (Servicio de Salud de Castilla y León; Castilla y Leon Healthcare Service) database of Castilla y Leon women, based on the healthcare card records. The accessible population of Castilla y Leon comprised all women aged ≥ 20 to ≤ 71 years who had access to a SACYL healthcare Social Security card. We chose a women population ranging from 20 to 71 years old because we hope we would have most responses to a test of sexual function.

The overall female population in this part of Spain, by January 1, 2008 was 1,287,992. The distribution by province is listed in the following Table 1.

Once we had the total number of women from the Castilla and Leon provinces, we needed to know how many would be able to take part in our study, i.e. women aged 20 to 71 years, statistically 67% of the population. Based on that distribution of women by province and age, surveys were sent to all nine Castilla y Leon provinces proportionally to the female population aged 20 to 71 in each province (Table 2).

According to published studies on female sexual dysfunction prevalence [8,9], the minimum sample that was required to measure it in Castilla y Leon was determined as 1,045 women (estimated prevalence 41-43%, inaccuracy 3%, $\alpha=0.05$ for a population of 851,122 Castilla y Leon women aged 20 to 71 years), and it was expected to reach it with an initial screening of 4,500 women. The sample size was obtained with the statistical software *ene 2.0*®.

The sample screening was based on the answers received from the survey that were sent to our chosen population of women and that were

returned by postal mail, way anonymous, studying all the cases that met the inclusion criteria for the female sexual function assessment in Castilla y Leon, and taking the Declaration of Helsinki principles into account [10].

The inclusion criteria for the study were as follows:

1. Any woman living in Castilla y Leon with access to an SACYL healthcare card
2. Women aged 20 to 71 years
3. Knowledge of the Spanish language
4. Literacy to read and fill in the questionnaire
5. Correct completion of the Female Sexual Function Index (FSFI® Spanish version).

Exclusion criteria involve all non-female subjects, subjects aged <20 or >71 years, illiterate, who do not know the Spanish language or who refuse to participate in the study.

A total of 4,500 women were randomly chosen from the SACYL healthcare card database, aged 20 to 71 years and domiciled in one of the nine Castilla y Leon provinces (initially the 4,500 women distribution has a representation similar to that of the general population of Castilla y Leon women regarding provinces and age). Letters were sent to the said women with the Spanish version of the FSFI® questionnaire, an explanatory letter with the reasons for this study, a written informed consent that was approved from Ethical Review Board of Rio Hortega University Hospital and a prepaid envelope for the return of the anonymously-completed questionnaire. The letters were sent on three occasions in the months of September and October 2008, February and March 2009, and August and September 2009. In total, 1,527 letters were correctly completed (33.9%) and 182 letters were returned by the Postal Service due to an unknown address or lack of data (4.04%).

The variables to be studied were:

- Epidemiological variables: province of residence in Castilla y Leon, age, race, sexual orientation, number of sexual acts per month, educational level, number of children, and previous vaginal surgery (any vaginal surgery is included: perineal repair after delivery, vaginal hysterectomy, dilation and curettage, cervix biopsy...).
- Female Sexual Function Index: FSFI® questionnaire, Spanish version (taken from www.mapi-institute.com). The original questionnaire developed by Rosen was translated into Spanish and validated by Blumel J.E et al. in 2004 [11,12].

This is a self-administered, 19-item questionnaire that, according to the original structure of the test, intends to evaluate six dimensions of female sexuality (2 desire-related items, 4 arousal-related items, 4 lubrication-related items, 3 orgasm-related items, 3 items to measure satisfaction, and 3 items to assess pain during sexual intercourse). The questionnaire, as in the case of the original, is based on a measurement of the answers in a Likert-type scale with five options that vary depending on the question contents. Each domain score is multiplied by a factor and the final result is the arithmetical sum of all domains. The higher the score, the better the female sexual function.

Authorizations to use the version validated and adapted to the Spanish population were requested and obtained. The statistical tests that we used were: Kolmogorov-Smirnov, Student t test or Mann-Whitney test and ANOVA with Bonferroni post-hoc or Kruskal-Wallis.

Female Populations referred to January 1 st , 2008 by province.	
PROVINCE	WOMEN (No)
Ávila	84.979
Burgos	183.997
León	255.414
Palencia	87.602
Salamanca	180.526
Segovia	80.647
Soria	46.765
Valladolid	268.944
Zamora	99.118
Total	1.287.992

Source: National Statistical Institute

Table 1: Distribution of the population of women of Castilla y Leon to January 1st, 2008.

Provinces	Provinces population	Population (20-71 years)	%	FSFI© sent	FSFI© received	% Answered
Avila	84.979	54.087	60,6	297	154	51,9
Burgos	183.997	121.807	14,3	643	157	24,4
León	255.414	167.780	19,8	892	144	16,1
Palencia	87.602	57.119	6,8	306	153	50,0
Salamanca	180.526	118.770	14,0	631	188	29,8
Segovia	80.647	52.030	6,3	282	154	54,7
Soria	46.765	29.113	3,6	163	146	89,4
Valladolid	268.944	187.966	20,9	940	295	31,4
Zamora	99.118	62.450	7,7	346	136	39,3
Castilla Y León	1.287.992	851.122	100	4500	1527	33,9

Table 2: Distribution of female population of women of Castilla y Leon: total population, population between 20 and 71 years, the percentage of female population in each province and the number of surveys sent by population and the number and percentage of completed surveys.

	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	TotalFSFI©
No	1526	1527	1527	1527	1527	1527	1526
Mean ± SD	3.2 ± 1.2	3.8 ± 1.8	4.2 ± 2.0	4.0 ± 2.0	4.2 ± 1.7	4.3 ± 2.0	25.5 ± 8.17
Median	3.6	4.2	5.1	4.8	4.8	5.2	28.4
Minimum	1.20	0.00	0	0	0	0	1.20
Maximum	6.00	6.00	6.00	6.00	6.00	6.00	36.00
Percentile	25	2.4	2.7	3.3	2.8	3.2	21.7
	75	4.2	5.4	6.0	5.6	5.6	31.4

SD: Standard Deviation; FSFI©: Female Sexual Function Index

Table 3: Score given to each domain of the FSFI© questionnaire and total score.

Changes of Female Sexual Function With Age (Mean ± SD)							
Age (yr)	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	Totalfsfi©
20-29	3.96 ± 1.0	4.60 ± 1.5	4.86 ± 1.7	4.63 ± 1.7	5.02 ± 1.1	4.66 ± 1.7	28.46 ± 6.3
30-39	3.79 ± 1.0	4.74 ± 1.2	5.17 ± 1.2	4.82 ± 1.4	5.00 ± 1.0	5.07 ± 1.3	28.85 ± 5.1
40-49	3.49 ± 1.0	4.22 ± 1.4	4.72 ± 1.5	4.56 ± 1.6	4.78 ± 1.2	4.91 ± 1.7	27.40 ± 6.5
50-59	2.82 ± 1.1	3.35 ± 1.7	3.80 ± 2.0	3.76 ± 2.0	4.22 ± 1.4	4.01 ± 2.1	22.98 ± 8.7
60-69	2.33 ± 0.9	2.10 ± 1.7	2.31 ± 1.9	2.34 ± 2.0	3.55 ± 1.5	2.71 ± 2.4	18.03 ± 8.8
≥ 70	2.13 ± 0.9	1.18 ± 1.2	1.28 ± 1.6	1.25 ± 1.7	3.12 ± 1.1	1.52 ± 2.2	12.87 ± 8.0
Total	3.29 ± 1.2	3.83 ± 1.8	4.21 ± 2.0	4.05 ± 2.0	4.57 ± 1.7	4.30 ± 2.0	25.56 ± 8.1

SD: Standard Deviation; yr: years; FSFI©: Female Sexual Function Index

Table 4: Values of the six domain and the overall result of the test FSFI © for the population of Castilla y León for decades. Notice the FSFI© decline from age 50.

Results

A total of 1,527 women who answered correctly completed the FSFI® questionnaire anonymously, and who sent it to the University Rio Hortega Hospital, were studied.

The 19 items of the questionnaire are divided into 6 domains that comprise desire, arousal, orgasm, lubrication, satisfaction, and pain. The questionnaire total score is the total FSFI®. The result of each of the 6 domains and the overall FSFI test result are presented in Table 3.

Knowing that sexual function is age-dependent, it is paramount to highlight differences by age group given their importance when discussing the results (Table 4).

We used mean confidence intervals to estimate the means in our sample of the Castilla y Leon population. Thus, we can estimate that in 95% of cases, the mean desire will be 3.33-3.45, in 95% of cases the mean arousal domain will be 4.01-4.17, mean lubrication domain will be 4.42-4.60, mean orgasm domain for our population will be 4.25-4.44, mean satisfaction domain will be 4.50-4.64, and mean pain will be 4.53-4.72; in the Castilla y Leon population.

In 95% of cases, the mean overall result of the FSFI® test will be 21.15-25.95 in Castilla y Leon women.

The six domains of FSFI®: desire, arousal, lubrication, orgasm, satisfaction, and pain, and the total result of the test will be compared in order to detect the differences among them by province, age, race, sexual orientation, sexual activity in the last four weeks, educational level, number of children and prior vaginal surgery. A significant difference was determined as $p \leq 0.05$ (Table 5).

If we consider sexual dysfunction based on the FSFI values given by the original author for the United States female population, we should consider that sexual dysfunction is a $FSFI \leq 26.55$ or ≤ 3.6 in some domains; for our Castilla y Leon women we would have 38.7% of women with sexual dysfunction. The following are sexual dysfunction predictors: primary education level, age ≥ 51 years and prior vaginal surgery.

Discussion

There are multiple tests validated and translated into Spanish to evaluate female sexual function. In general terms, they can be divided into two groups: Specific and General test.

Specific tests study female sexual dysfunction in women with pelvic floor dysfunction: Organ Prolapse Urinary Incontinence Sexual Questionnaire. (PISQ-31) [13], Organ Prolapse Urinary Incontinence

P value	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain	FSFI®
Province	0.068	0.017	0.054	0.020	0.317	0.024	0.166
Age	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Race	0.888	0.048	0.652	0.341	0.056	0.021	0.052
Sexual orientation	0.033	0.044	0.010	0.953	0.893	0.634	0.340
Sexual activity	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Educational level	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Children	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Vaginal Surgery	0.000	0.000	0.000	0.001	0.001	0.002	0.000

P value ≤ 0.05: Statistical significant difference

Table 5: Statistical differences obtained by variables: province, age, race, sexual orientation, sexual activity in the last four weeks, educational level, number of children and prior vaginal surgery.

P25	Total population	20-29 yr	30-39 yr	40-49 yr	50-59 yr	60-69 yr	>70 yr
Desire	2.4	3.6	3	3	1.8	1.2	1.2
Arousal	2.7	4.2	4.2	3.6	2.1	0	0
Lubrication	3.3	4.8	4.8	3.9	2.6	0	0
Orgasmo	2.8	4.4	4.4	4	2.7	0	0
Satisfaction	4	4.8	4.8	4.4	3.5	2.4	2.4
Pain	2.7	4	4.8	4.8	2.4	0	0
Totalsfsfi®	21.7	27.95	26.9	24.95	18.8	11.6	5.1

P25: percentile 25; yr: years. FSFI®: Female Sexual Function Index

Table 6: Percentile 25 FSFI® test results. New cutoff points to diagnose the female sexual dysfunction of Castilla y Leon.

Sexual Questionnaire (PISQ-12) [14] (it is the PISQ form reduced to 12 questions). Further tests assessing sexual function are: ICIQ-VSex. Internacional Consultation on Incontinente Moular Questionarire [15]. SFQ-V1. Sexual function questionnaire [16]. CSFQ. Changes in Sexual Functioning Questionnaire [17]. Sexual History Form (SHF-12) (SHF-24) [18,19]. International Consultation on incontinence questionnaire Vaginal Symptoms [20]. (ICIQ VS). SHOW-Q. Sexual Health Outcomes in Women Questionnaire [21].

General tests study the female sexual function of women without specific prior pathologies: Cuestionario de Función Sexual de la mujer (FSM) [22], Female Sexual Function Index (FSFI) [11,23].

FSFI is a self-administered, 19-item general test that investigates all the items to diagnose female sexual dysfunction according to DSM V. Every item is assessed with a score from 0 to 5, the total score being 1.2-36. Sexual function is considered pathological when the score is 26.55 or lower or when the score of any domain is lower than 3.6. This test was validated and translated into Spanish by Blumel [12]. We chose this test to determine the Female Sexual Function in normal Spanish women, with or without prolapse or incontinence.

At the very outset of our work, we asked ourselves as to what the ideal test for our practice was. After assessing the characteristics of the PISQ-12 and the Spanish version of the FSFI®, we preferred the latter for several reasons:

- It evaluates strictly female aspects of sexuality, not taking into account male factors such as erectile dysfunction or premature ejaculation; it only takes women and their characteristics into account, and not the couple's sexual activity.
- The FSFI® is a test that studies female sexual function in general, not specifically that of patients with pelvic floor conditions. This is important because one of the goals of these tests is to compare sexual function after a surgery for pelvic organ prolapse or stress incontinence and to quantify restitution *ad integrum* of sexual function following surgery, i.e. restoring the sexual function of a normal woman with her characteristics, except for the pelvic floor condition.

- In a literature review of 2009 [24], it is described that when comparing sexual function in pre- and post-surgery patients (pelvic floor surgery) with specific tests like PISQ, sexual function increases 70% after surgery, whereas if general tests such as FSFI® are used, no differences are appreciated in sexual function before and after performing the pelvic floor surgery, since we are comparing the overall aspects of female sexuality and not whether the patient has coital incontinence or a mass effect in the vagina, which changes the final result in specific tests.

When studying the type of population made up of Castilla y Leon women, we must take into account the sociocultural, political, and religious background of our country. A determinant fact to have in mind is that Spaniards lived under a dictatorship until 1978 when Spain became a secular nation with the approval of the Spanish Constitution. We also should bear in mind that Catholic education only hold with sexual intercourse for procreative purposes and goes against the use of contraceptives. Most women in our society are older than 30 and will, therefore, be influenced by those ideas and that culture; particularly the women who we are focused on, i.e. candidates for a pelvic floor surgery and, therefore, older than 40 years in most cases.

Due to the above and to the unequal cultural and educational conditions, in our studies of sexual functioning we cannot consider the same cut-off point (FSFI® ≤ 26.55) used to determine female sexual dysfunction in the United States. In our results, we obtained a mean score of 25.5 ± 8.1 and a percentile 25 of 21.7 that essentially corresponds to the other requirement given by the author for female sexual dysfunction in one of the domains with a score of 3.6; in our case, all domains are lower than 3.6 (3.6×6=21.66).

In this way, only 24.8% of our population could be diagnosed with sexual dysfunction, with statistically significant negative predictors being: age ≥ 51 years, primary education studies and prior vaginal surgery, the same results as with the FSFI® ≤ 26.55 cut-off point. If we apply this percentile 25 to the different age decades, we see that cut-off points differ significantly from the original and we must continue investigating from there (Table 6).

The FSFI® test was also translated into Portuguese and validated in Brazilian women by Hentschel [25] in 2007 and by Pacagnella in 2009. This test was also translated into German and validated by Berner in 2004. There are numerous applications of the FSFI® questionnaire and its various translations and validations found in the literature but, due to its cultural similarity, we wanted to give relevance to a study in Italian women by Nappi, published in 2008. Nappi conducted a study with the Italian FSFI test; the FSFI mean score was 27.6 (with 25 percentile: 18.7 and 75 percentile: 30.9). 24.4 per cent of the surveyed sample was below the 25th percentile. Women with a test score below the 75th percentile had a clinical interview following the DSM-IV diagnosis criteria for sexual dysfunctions. Women were classified as having sexual dysfunction or not, showing that most sexual dysfunction cases had a test score below the 25th percentile. Thus, this is the only study where we found some cut-off points different from those of the original FSFI ≤ 26.55 :

- For women of childbearing age: FSFI ≤ 23.4 (in oral contraceptive non-users) and FSFI ≤ 20.8 (in oral contraceptive users).
- For menopausal women: FSFI ≤ 14.1 (in women not on hormone replacement therapy) and FSFI ≤ 18.5 (in women on hormone replacement therapy).

Comparing our results with those from another Spanish Autonomous Community, namely Catalonia, in a study performed by Dra. Espuna [15] who used the PISQ-12, a result of 36.875 ± 7.808 was obtained with that test for women with a mean age of 47.9 years, (the maximum score was 48 in this test, so taking a measurement over 10 we would get a score of 7.6), whereas our population with a mean age of 48.8 had a mean FSFI® score of 25.55 (if we take this score to one over 10, we would get a total of 7.09). Therefore, we estimate that the score is similar in both communities. Thus, further studies would be necessary in our country to determine the actual level of female sexuality in Spain and to specify a correct and suitable cut-off point for our country. Given the historical and cultural similarities in the Iberian Peninsula, the studies should be enlarged to include Portuguese women.

Conclusions and Relevance

Summarizing the statements above, we may conclude that:

1. Our population has a mean score in Rosen's FSFI® test of 25.5 (1.2-3.6), similar to the score obtained by Spanish and European women.
2. The results in our study population differ from the United States standards and, therefore, we cannot apply their cut-off points when evaluating the FSFI® test and diagnose a woman with sexual dysfunction with the values applied by United States investigators.
3. A new specific cut-off point has been obtained to diagnose sexual dysfunction in our female population, FSFI® ≤ 21.7 as well as specific cut-off points per decade of life in Castilla y Leon women: 20-29 years: FSFI® ≤ 27.95 ; 30-39 years: FSFI® ≤ 26.9 ; 40-49 years: FSFI® ≤ 24.95 ; 50-59 years: FSFI® ≤ 18.8 ; 60-69 years: FSFI® ≤ 11.6 ; and women older than 70 years: FSFI® ≤ 5.1 .

Author's Contribution

- F Castroviejo Royo: Project development, Data collection, Manuscript writing
- C Conde Redondo: Project development, Data collection, Data analysis

- L A Rodriguez Toves: Project development, Data collection, Data analysis
 - C Marina Garcia-Tunon: Project development
 - Carmen Gonzalez Tejero: Project development
- J Martinez-Sagarra Ocejia: Project development

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