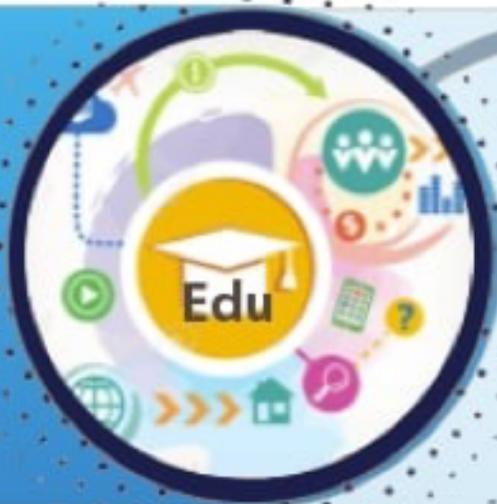




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# Assessment of Sexual Dysfunction Among Women with Neurological Diseases

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## ABSTRACT

**Background.** The objective of the study is to assess the level of sexual dysfunction in women with neurological diseases within the medical and sociological research of such patients.

**Materials and methods.** Seventy-four female patients aged from 27 to 55 years with disorders of sexual function associated with neurological diseases were interviewed at the city clinical hospital No. 1, Tashkent, the Republic of Uzbekistan. The neurological diseases in this patient group included: a condition after a brain injury, acute cerebrovascular accident, Parkinson's disease, multiple sclerosis, chronic pain syndrome, and epilepsy with no epileptic seizure. "The Female Sexual Function Index" (FSFI) was used as a tool for assessing sexual dysfunction.

**Results.** During the medical and sociological study, an unsatisfactory level of sexual function was revealed in 74 (100%) women with neurological diseases; 52 (70.3%) of them had sexual dysfunction. The lowest score among the 6 domains of the FSFI questionnaire was recorded in the level of lubrication and psychological satisfaction. Most of the study participants (70 women, 94.6%) talked about problems associated with the complete absence of lubrication during sexual intercourse, and a similar number of women informed on a complete lack of psychological satisfaction, i.e. orgasm.

**Conclusion.** A persistent decrease in sexual function up to the formation of SD is inherent in women with neurological pathology and tends to cause distress. This phenomenon hurts both the physical and psychosocial health of a woman. Restoring sexual health and function is a necessary element of medical care for patients with neurological diseases. Regarding this problem in the Republic of Uzbekistan, there is an urgent need in not only diagnosing and treating sexual dysfunction but also in several educational actions with patients who often do not want and cannot talk about some problems that are essential for the population's well-being.

**Keywords:** sexual dysfunction, women, medical and sociological research, FSFI scale, neurological diseases.

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## INTRODUCTION

Currently, the interest in the issue of sexual dysfunction (SD) of women with neurological diseases is growing in the global scientific and medical community [1].

However, there are few publications on the impact of neurological diseases on the sexual function of women [2, 3, 4].

The relative rarity of these studies is associated with traditional restrictions on discussion of the topic of SD in some countries [5, 6].

Some studies have a religious context and investigate SD in women with neurological diseases in terms of cultural and religious prescriptions [7].

At the same time, it is no secret that patients with neurological diseases over time note disorders of physical and psychosocial functions, including motor and cognitive ones. Such disorders can include SD [8].

The interest in studying SD among female neurological patients is because 70% of cases are potentially able to continue sexual activity [9].

It is also worth mentioning that disorders of sexual behaviour and sexual dissatisfaction have a serious impact on mental health and can ultimately lead to feelings of social disadvantage [10, 11].

Thus, it is important to study and assess SD among women suffering from neurological diseases to form programs for comprehensive rehabilitation and restoration of sexual function and improve the quality of life of women suffering from neurological diseases. In addition, it is worth emphasizing the importance of resolving the SD problem among women with neurological pathology, since disorders of sexual function have a much more detrimental effect on mental health than the severity of physical disability associated with the underlying disease [10, 13].

The object of the study is to assess the level of sexual dysfunction in women with neurological diseases in a medical and sociological study.

## MATERIALS AND METHODS

In 2021 - 2023, patients with neurological diseases and disorders of sexual function were interviewed at the city clinical hospital No. 1 (Tashkent, Uzbekistan). The study involved 74 women, whose average age was  $39.3 \pm 8.7$  years ranging from 27 to 55 years. All women were married at the time of the study; the average duration of their marital life was  $17.5 \pm 8.1$  years ranging from 3 to 35 years. The mean body mass index

(BMI) was  $27.2 \pm 4.6$  kg/m<sup>2</sup>, ranging from 18.8 to 36.5 kg/m<sup>2</sup>. The average financial income was 900 \$/month. Twenty-three women (31.1%) had higher education, 27 (36.5%) had secondary-special education, and 24 (32.4%) finished school (11-year comprehensive school). As for their labour history, participants 36 (48.6%) were employed and 38 (51.4%) women were housewives.

All patients had a history of neurologic pathology including a traumatic brain injury (TBI) (11; 14.9%), acute cerebrovascular accident (ACVA) (11; 14.9%), Parkinson's disease (PD) (10; 13.5%), multiple sclerosis (MS) (10; 13.5%), a tension-type headache (migraine) (TTH) (11; 14.9%), chronic pain syndrome (CP) (11; 14.9%) and epilepsy with no epileptic seizure (ES) (10; 13.5%).

The "Female Sexual Function Index" (FSFI) questionnaire included 6 main domains, 19 questions and a range of 2 to 36 points. The result is assessed using a generalized FSFI index, where the value up to 14.4 points is a pronounced degree of SD, 14.5 - 21.6 points mean a moderate degree of SD, while 21.7 - 28.8 points were interpreted as a low degree of SD and a FSFI index above 28.9 points corresponds to sexual comfort. The FSFI questionnaire allows for assessing such parameters of sexual function as the level of attraction, arousal, lubrication, physical and psychological pleasure, as well as the presence of pain syndrome in sexual intercourse [12].

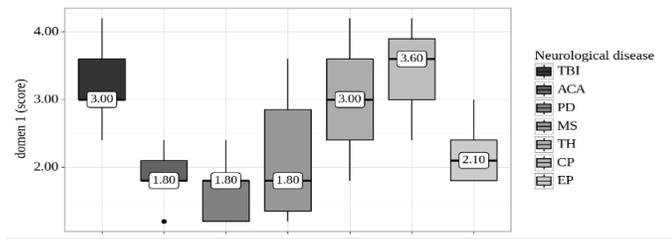
## RESULTS

When analyzing the answers to the FSFI questions, significant differences were revealed between the patients with neurological diseases depending on the diagnosis. Statistically significant ( $p < 0.05$ ) differences between the study participants were recorded in the indicators of sexual attraction, arousal, level of physical satisfaction and the presence of pain syndrome during sexual intercourse depending on the neurological diagnosis.

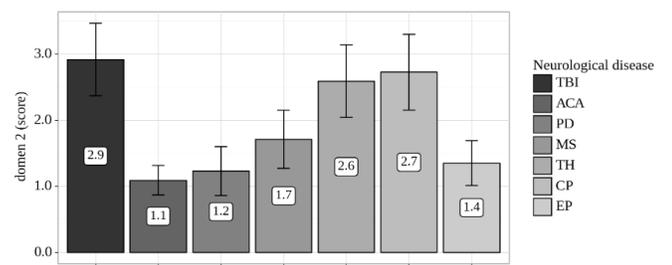
According to the analysis of the sexual attraction index (Domain 1), the highest level of this indicator was observed in the female patients with CPS ( $3.6 \pm 0.6$  points); in women with TBI, the sexual attraction index was  $3.0 \pm 0.6$  points; the patients with TTH, it made  $3.0 \pm 1.2$  points, and those with EP had  $2.1 \pm 0.3$  points. The lowest rates of sexual attraction were observed in women who had ACVA, PD and MS ( $1.8 \pm 0.6$  points,  $p < 0.001$ , using the Kruskal-Wallis test) (Fig. 1).

When analyzing the sexual arousal score (Domain 2), the highest values were obtained in patients who had TBI ( $2.9 \pm 0.6$  points), CP ( $2.7 \pm 1.2$  points), TTH ( $2.6 \pm 1.8$

points). The lowest indicator of sexual arousal was found in women with ACVA (1.0±0.2 points), while those with MS had 1.7±0.6 points; the patients with ES had 1.4±0.3 points, and those with PD had 1.2±0.3 points ( $p < 0.001$ , the Fisher F-test), (Fig. 2).

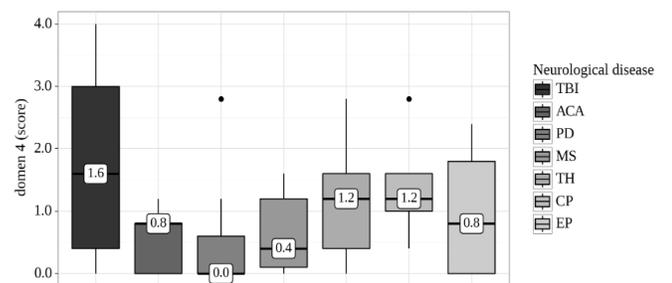


**Domain 1 (points). Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES.**  
**Figure 1. Sexual attraction score by neurological diseases in the study participants.**



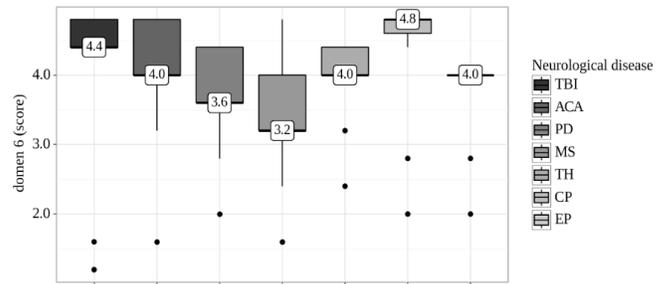
**Domain 2 (points). Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES.**  
**Figure 2. Sexual arousal score by neurological diseases in the study participants.**

Analysis of physical satisfaction values (Domain 4) demonstrated that patients with TBI had the highest score of 1.6±1.2 points, those with TTH had 1.2±0.4 points, women with CP had 1.2±0.2 points, ACVA patients had 0.8±0.4, those with EP had 0.8±0.8 points, patients MS had 0.4±0.4 points and the no physical satisfaction was recorded in PD patients (0.0 points,  $p = 0.034$ , the Kruskal-Wallis test), (Fig. 3).



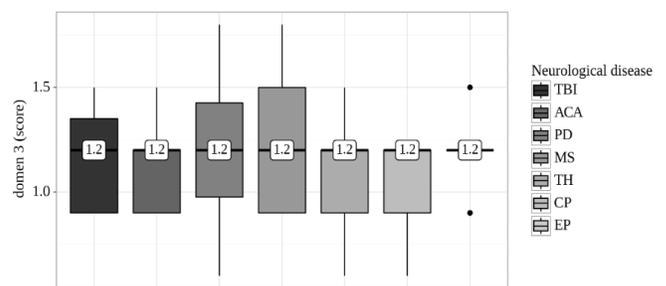
**Domain 4 (points). Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES.**  
**Figure 3. Physical satisfaction score by neurological disease in the study participants.**

When analyzing the level of pain syndrome (Domain 6) in the study participants, the highest value was recorded in women with CB (4.8±0.2 points), TBI patients had 4.4±0.3 points; they were followed by ACVA patients with 4.0±0.8 points; TTH patient had 4.0±0.3 points, those with EP had 4.0 points; PD patients had 3.6±0.4 points, and the lowest values of the level of pain syndrome in sexual intercourse were noted in patients with MS: 3.2±0.5 points ( $p = 0.008$ , the Kruskal-Wallis test), (Fig. 4).



**Domain 6 (points) Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES**  
**Figure 4. The score of pain during sexual contact by neurological diseases in the study participants.**

When analyzing the indicator of the level of lubrication (Domain 3) and the level of psychological satisfaction from sexual contact (Domain 5) in the women participating in the study, statistically significant differences could not be identified. The value of the lubrication score among all study participants was 1.2±0.4 points ( $p = 0.789$ , the Kruskal-Wallis test), (Fig. 5).

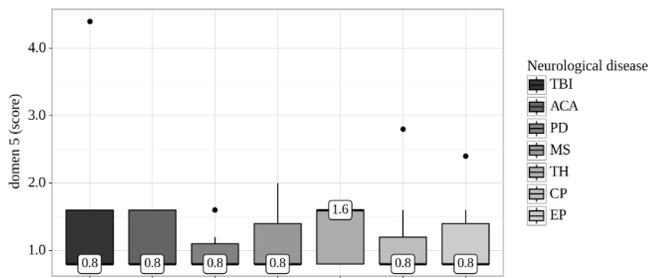


**Domain 3 (points) Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES.**  
**Figure 5. The rate of lubrication by neurological diseases in the study participants.**

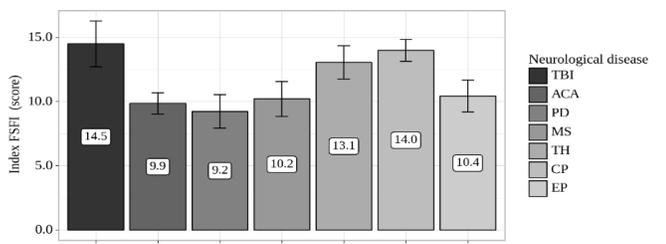
The level of psychological satisfaction from sexual contact in the study participants with diagnoses of the condition after the previous TBI, ACVA or PD, MS, CB, and EP were 0.8 points; in patients TTH it was 1.6±0.4 points ( $p = 0.713$ , the Kruskal-Wallis test), (Fig. 6).

A comparative analysis of the total FSFI score showed statistically significant differences ( $p < 0.05$ ). For instance, the highest value of the FSFI Index was

found in patients with TBI (14.5±2.6 points), while in the CP cases it was 14.0±1.3 points, followed by TTH with 13.1±1.9 points, EP with 10.4±1.7 points; MS cases had 10.2±1.9 points, 9.9±1.2 points, and the lowest FSFI index was recorded in women suffering from PD who had 9.2±1.8 points, (p < 0.001, the F method of Fischer test), (Fig. 7).



**Domain 6 (points) Diagnosis: TBI. ACVA. PD. MS. TTH. CP. ES**  
**Figure 6. The levels of psychological satisfaction by neurological diseases in the study participants.**



**Domain 6 (points) TBI. ACVA. PD. MS. TTH. CP. ES**  
**Figure 7 - Analysis of FSFI score by neurological disease among study participants.**

Statistical analysis, in addition to obvious data, also revealed a correlation between the level of age and the number of years lived in married life and the FSFI index level among patients suffering from neurological diseases (Table 1).

**Table 1**  
**Correlation patient age, marriage duration, and total FSFI score**

Index	Correlation characteristics		
	R <sub>xy</sub>	Bond strength on Chaddock scale	p
Age –FSFI Index	-0.299	Weak	0,010*
Marriage duration –FSFI Index	-0.354	Moderate	0,002*

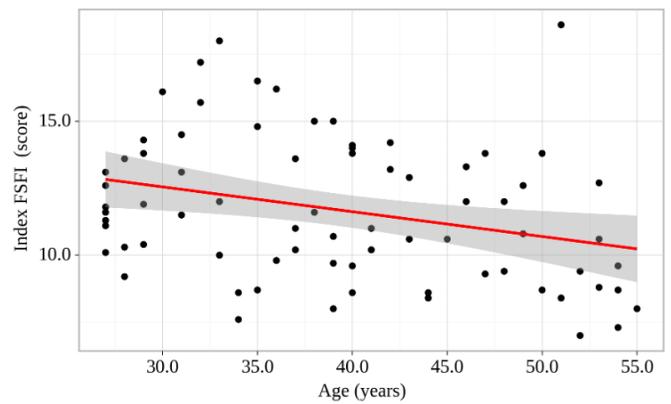
\* Statistically significant differences (p<0.05)

The assessment of the FSFI scores association and the age of the study participants demonstrated the feedback little bond. The observed dependence of the total FSFI

Index on the age of the study participants is described by the equation of paired linear regression:

$$Y \text{ FSFI}_{\text{Index}} = -0.093 \times X_{\text{Age}} + 15.329$$

With the 1-year increase in the age of the study participants, a decrease in the total FSFI score by 0.093 points should be expected. The resulting model explains 8.9% of the observed variance in the total FSFI index scores (Figure 8).

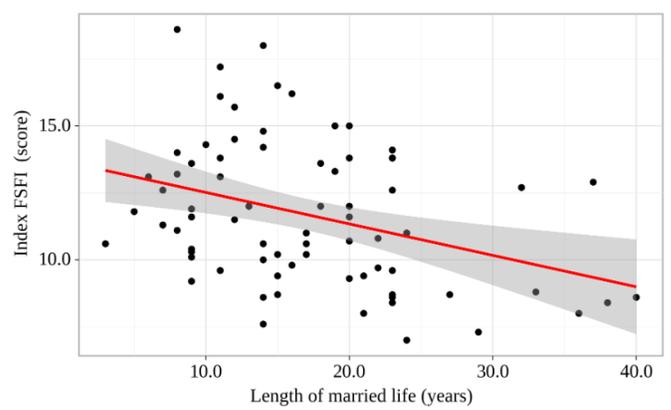


**Figure 8. Regression function plot characterizing the relationship between the overall FSFI score and the age of the study participants.**

When assessing the association of the total FSFI index score and marriage duration, was determined moderate close feedback. The observed dependence of the total FSFI index score on the term of marriage duration is described by the pairwise linear regression equation:

$$Y \text{ FSFI}_{\text{Index}} = -0.117 \times X_{\text{Maturity}} + 13.688$$

With a 1-year increase in marital life, a decrease in the overall FSFI score of 0.117 points should be expected. The resulting model explains 12.6% of the observed variance in the total FSFI index scores (Figure 9).



**Figure 9. Regression function plot characterizing the relationship between the total FSFI score and the time of marital life of the study participants.**

## DISCUSSION

The medical and sociological survey of women with neurological diseases revealed an unsatisfactory level of sexual function in 74 (100%), including SD in 52 (70.3%) women. At the same time, in 22 (29.7%) patients who had the best FSFI score, there were 10 (13.5%) post-TBI patients, 7 (9.4%) CP patients, 4 (5.4%) patients suffered from TTH and 1 (1.3%) women had EP, which indicates the presence of a moderate SD and emphasizes the effect of neurological disease only on certain domains of the FSFI scale in a small part of the study participants.

The lowest rate of sexual function showing a marked SD was found in 10 women suffering from PD (13.5%); 11 ACVA patients (14.9%); with MS 10 (13.5%); 9 EP patients 1 (2.2%) showed, those with CB 4 (5.4%), 7 CTH-patients (9.4%), and only 1 (1.3%) patient is post-TBI. The obtained results reflect the impact of neurological disease on sexual function, considering active sexual life before the onset of neurological pathology in the study participants.

The lowest rates among the 6 domains of the FSFI questionnaire were recorded in the level of lubrication and psychological satisfaction. At the same time, the absolute majority, 70 (94.6%) of the study participants noted problems associated with the complete absence of lubrication during sexual intercourse and a similar number of women, noted a complete lack of psychological satisfaction, i.e. orgasm. These findings may be directly related to the effect of underlying disease on sexual function and result from the lack of medical care to correct SD. However, this conclusion needs further clinical trials of comprehensive programs of the sexual function restoration and correction of SD.

It was possible to identify the association between the progression of SD and the age of patients suffering from neurological diseases. For instance, patients aged 47 years and older have worse FSFI scores, which hypothetically may be associated with the effect of an underlying neurological pathology on sexual function in older patients. On the other hand, there was an association with the marital life expectancy of patients with a low FSFI Index. [7]

Neurological female patients with a 15-year married life had lower FSFI scores; it certainly reflects a low level of psychological parameters of sexual function, but in this situation, the synergistic effect of the underlying disease and the duration of married life cannot be excluded. [7,10]

In general, the obtained findings indicate the presence of SD in patients with neurological disorders. The authors attributed the small sample size to the study limitations as well as the sample heterogeneity, the lack of information on the timing of neurological events, and no sexual function assessment of sexual partners (spouses) in the study participants.

## CONCLUSIONS

Sexual function is an important aspect of women's quality of life, including those with neurological disorders. A persistent decrease in sexual function up to SD may lead to distress, depression, destruction of family relationships and divorce. This condition causes deterioration of the physical and psychosocial health of women. It is of great importance to create methods and tools for the treatment of SD specifically in women.

**Contradictions, conflicts of interest and funding:** the authors of the study declare the absence of financial and other conflict interests, including contradictions during this study.

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## NEVROLOGIK KASALLIKLARGA CHALINGAN AYOLLARDA JINSIY DISFUNKTSIYANI BAHOLASH

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Toshkent Tibbiyot Akademiyasi  
АБСТРАКТ

**Dolzarbliqi:** Tadqiqotning maqsadi tibbiy va sotsiologik tadqiqotlar doirasida nevrologik kasalliklarga chalingan ayollarda jinsiy disfunktsiya darajasini baholashdan iborat.

**Material.** 27 yoshdan 55 yoshgacha bo'lgan, nevrologik kasalliklar bilan bog'liq jinsiy funktsiyasi buzilgan yetmish to'rt nafar bemor ayollar bilan O'zbekiston Respublikasi, Toshkent shahar 1-sonli shahar klinik shifoxonasida suhbat o'tkazildi. Ushbu bemor guruhidagi nevrologik kasalliklarga quyidagilar kiradi: miya shikastlanishidan keyingi holat, insult, Parkinson kasalligi, tarqoq skleroz, surunkali og'riq sindromi va epilepsiya. "Ayollarning jinsiy funktsiyasi indeksi" (FSFI) jinsiy disfunktsiyani baholash vositasi sifatida ishlatilgan.

**Natijalar.** Tibbiy va sotsiologik tadqiqotlar davomida nevrologik kasalliklarga chalingan 74 (100%) ayollarda jinsiy funktsiyaning qoniqarsiz darajasi aniqlandi; ularning 52 (70,3%) jinsiy disfunktsiyaga ega edi. FSFI so'rovnomasining 6 domenlari orasida eng past bal lubrikatsiya va psixologik qoniqish darajasida qayd etildi. Tadqiqot ishtirokchilarining mutlaq ko'pchiligi (70 ayol, 94,6%) jinsiy aloqa paytida lubrikatsiya to'liq yo'qligi bilan bog'liq muammolar haqida gapirib berishdi va shunga o'xshash ayollar psixologik qoniqishning, yani orgasm, to'liq yetishmasligi haqida ma'lumot berishdi

**Xulosa.** O'zbekiston Respublikasida ushbu muammoga kelsak, nafaqat jinsiy disfunktsiyani tashxislash va davolashda, balki ko'pincha aholi farovonligi uchun zarur bo'lgan ba'zi muammolar haqida gapirishni istamaydigan va gapira olmaydigan bemorlar bilan o'tkaziladigan bir qator tarbiyaviy tadbirlarda ham dolzarb ehtiyoj mavjud.

**Kalit so'zlar:** jinsiy disfunktsiya, ayollar, tibbiy va sotsiologik tadqiqotlar, FSFI shkalasi, nevrologik kasalliklar.

## ОЦЕНКА СЕКСУАЛЬНОЙ ДИСФУНКЦИИ У ЖЕНЩИН С НЕВРОЛОГИЧЕСКИМИ ЗАБОЛЕВАНИЯМИ

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АБСТРАКТ

**Актуальность:** Целью исследования является оценка уровня сексуальной дисфункции у женщин с неврологическими заболеваниями в рамках медико-социологического исследования таких пациенток.

**Материалы и методы.** Семьдесят четыре пациентки женского пола в возрасте от 27 до 55 лет с нарушениями сексуальной функции, связанные с неврологическими заболеваниями, были опрошены в городской клинической больнице № 1, Ташкент, Республика Узбекистан.

**Результаты.** В ходе медико-социологического исследования неудовлетворительный уровень сексуальной функции был выявлен у 74 (100%) женщин с неврологическими заболеваниями; у 52 (70,3%) из них наблюдалась сексуальная дисфункция. Самые низкие баллы среди 6 областей опросника FSFI были зафиксированы по уровню смазки и психологической удовлетворенности. Абсолютное большинство участниц исследования (70 женщин, 94,6%) рассказали о проблемах, связанных с полным отсутствием смазки во время полового акта, и такое же количество женщин сообщили о полном отсутствии психологического удовлетворения, т.е. оргазма.

**Выводы:** в Республике Узбекистан существует острая необходимость не только в диагностике и лечении сексуальной дисфункции, но и в ряде просветительских мероприятий с пациентами, которые часто не хотят и не могут говорить о некоторых проблемах, имеющих важное значение для благополучия населения.

**Ключевые слова:** сексуальная дисфункция, женщины, медико-социологические исследования, шкала FSFI, неврологические заболевания.