

# Transcultural adaptation and psychometric validation of the Female Sexual Function Index (FSFI) questionnaire in the Kazakh population

Botagoz Aitbayeva<sup>1\*</sup> , Serik Iskakov<sup>1</sup> , Lazat Smailova<sup>1</sup> 

<sup>1</sup>Department of Obstetrics and Gynecology No. 2, NpJSC “Astana Medical University”, Astana, KAZAKHSTAN

\*Corresponding Author: [aitbayeva.botagoz@gmail.com](mailto:aitbayeva.botagoz@gmail.com)

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## ABSTRACT

**Introduction:** Sexual dysfunction associated with pelvic organ prolapse (POP) is common and validated questionnaires for assessment are recommended.

**Aim:** To develop and validate the Kazakh-translated version of the female sexual function index (Kz-FSFI).

**Methods:** Kz-FSFI was translated from the original version for validation, and its precision was ascertained through reverse translation by an expert team. 35 sexually active females participated in an evaluation of the test-retest reliability of the Kazakh version over a two-week period. In the next stage, 110 healthy women and 40 patients with POP aged 18-55 years were enrolled in the study. The validity, internal consistency reliability and test-retest reliability of the questionnaires were assessed.

**Results:** The cross-cultural adaptation of Kz-FSFI achieved good semantic, conceptual, idiomatic and content equivalence. The test-retest reliability was shown to be high in all of the cases ( $p < 0.001$ ). Cronbach's alpha coefficients for total and domain scores were sufficiently high (range 0.85-0.94) for the total sample. The discriminant validity showed statistically significant differences between patients with POP-associated sexual dysfunctions and the control group.

**Conclusions:** Kz-FSFI questionnaire is a valuable tool for screening women with sexual dysfunction. As this questionnaire had validity in the Kazakhstan survey, it could be used for medical counselling and future investigation in our country.

**Keywords:** female sexual function index, Kazakh version, validation

## INTRODUCTION

Sexuality is unquestionably a fundamental aspect of adult existence, a fact recognized by World Health Organization, which regards female sexuality as vital to women's health [1]. A myriad of external influences, sociocultural factors, mental health, interpersonal relationships, and urogynecological diseases, could potentially have a negative impact on women's sexual function (SF) [2]. The current state of women's sexual health underlines the proactive approach women are taking to ameliorate their sexual problems [3]. The prevalence of female sexual dysfunction (FSD) spans a broad spectrum, with anywhere from 8.0% to 75.0% of women worldwide affected [4]. This condition can be linked to psychological distress, such as depression, anxiety, and a reduction in self-esteem [5]. Consequently, there is an expanding body of research exploring the correlation between FSD and quality of life [6, 7]. Unfortunately, accurate data on the prevalence and associated risk factors impacting SF in Kazakh women remain elusive.

In line with the Food and Drug Administration's guidelines, the sensitivity of a questionnaire is a necessary criterion for its employment as a diagnostic device [8]. The female sexual function index (FSFI) has been utilized in diverse cultures and

communities and has been translated into 30 languages [9-13]. Its efficacy has been validated by research assessing FSFI outcomes in patients with a variety of medical conditions [14-17]. In Kazakhstan, the Russian variant of FSFI questionnaire is most commonly used to measure FSD. However, over half of the female population in the country (69.4%) are native speakers of Kazakh [18]. Consequently, many women, in practice, have been compelled to decline the completion of questionnaires due to linguistic barriers. In order to enable comparisons of women's SF research data in Kazakhstan with that of other countries, translation into Kazakh was deemed essential. Given the recommendation for the use of questionnaires in assessing FSD, our objective was to translate, formulate, and validate FSFI questionnaire for the Kazakh-speaking demographic.

## MATERIALS AND METHODS

FSFI questionnaire assesses six domains of female sexual function over the past four weeks: desire (item 1 and item 2), arousal (item 3-item 6), vaginal lubrication (item 7-item 10), orgasm (item 11-item 13), satisfaction (item 14-item 16), and pain (item 17-item 19). Initial item scores are determined based

on the degree of sexual dysfunction. The scoring for item 3-item 14 and item 17-item 19 ranges from zero to five, while for item 1, item 2, item 15, and item 16, it ranges from one to five. To get the score for individual domains, the scores of the items that make up the domain are summed, and then the resulting sum is multiplied by the domain coefficient. The domain coefficient for “desire” is 0.6, for “arousal” and “vaginal lubrication” it is 0.3, and for the domains “orgasm”, “satisfaction”, and “pain” it is 0.4. The total score is obtained by summing the scores of all six domains, which ranges between two and 36, with higher scores reflecting superior function. [19]. A comprehensive score of between 23 and 26.55 is indicative of severe FSD [20-22].

The translation process of the English version of FSFI to Kazakh was conducted in accordance with the stages outlined in “Translation and cultural adaptation of patient reported outcomes measures–Principles of good practice”. The translation procedure of the English version of FSFI to Kazakh followed the stages of “Translation and cultural adaptation of patient reported outcomes measures–Principles of good practice” [23]:

**Stage 1.** Direct translation of the questionnaire from the original language. The person performing the translation met the following requirements: having higher medical education, not previously familiar with this questionnaire, and being a native of Kazakh.

**Stage 2.** Based on a direct translation by a group of gynaecologists, all discrepancies were eliminated using the alternative translation method.

**Stage 3.** The preliminary version has undergone a reverse translation at this stage. The person performing the translation met the following requirements: having higher medical education, had not previously been involved in the process of translating this questionnaire, fluent in English and Kazakh.

**Stage 4.** Independent evaluation, as well as spelling and grammatical editing, were carried out as part of independent experts. Thus, a test version of the questionnaire was obtained.

**Stage 5.** The equivalence of points and answer options in translation from the original was checked. 35 respondents took part in the testing.

Participants were asked to complete the survey during their initial visit and then retake it two weeks later. All participants were native Kazakh speakers. After evaluating the cognitive interview results, the final Kazakh version was prepared for statistical validation. Special emphasis was placed on ensuring that the meaning of the Kazakh version (**Appendix A**) paralleled the original version (**Appendix B**) created by Rosen et al. [3].

## Patients and Enrollment

This multicenter cross-sectional study was carried out between September and December 2022 at various outpatient clinics and the gynaecology department of Multidisciplinary Regional Hospital No. 2, Astana, Kazakhstan. Participation was voluntary and anonymous. All participants were sexually active and had been in a stable relationship for at least four weeks prior to the survey. Prior to the commencement of the survey, informed consent was obtained from all participants. Inclusion criteria for this study were, as follows:

- (1) women aged between 18-55,

**Table 1.** Baseline characteristics of symptomatic & control groups

	Symptomatic (n=40)	Control (n=110)
Age (median) (range)	48 (30-55)	37 (19-53)
Parity (median) (range)	3 (1-5)	1 (0-3)
BMI (median) (range)	27.6 (24.1-32.6)	24.9 (20.8-30.3)
Partnership status (n), (%)		
Married	33 (82.5)	76 (69.1)
Partnered (not married)	7 (17.5)	34 (30.9)
Menstruation status (n), (%)		
Menstrual cycle	31 (77.5%)	95 (86.4%)
Menopause	9 (22.5%)	15 (13.6%)
Education level (n), (%)		
High school degree	3 (7.5%)	6 (5.5%)
College/university graduation	37 (92.5%)	104 (94.5%)

Note. BMI: Body mass index

- (2) proficiency in the Kazakh language in both speech and writing, and

- (3) currently married and sexually active within the last six months.

Exclusion criteria included the followings:

- (1) current pregnancy, within six months postpartum or post-surgery,

- (2) diagnosed mental illness, and

- (3) involvement in extramarital affairs.

Retrospective data from patients with pelvic organ prolapse (POP), a condition commonly associated with sexual dysfunctions, were used for the clinical (symptomatic) group [24]. All women in the symptomatic group had a POP degree of  $\geq 2$ , as per POP-quantification system (POP-Q) [25].

## Statistical Processing

The questionnaire results were analyzed using SPSS version 23. Demographic variables were examined using descriptive statistics. Reliability was evaluated through internal consistency and test-retest reliability. Cronbach's alpha was used to assess internal consistency, with a value of  $\geq 0.7$  considered acceptable [26].

The intraclass correlation coefficient (ICC) was employed to analyze test-retest reliability, and a value  $\geq 0.80$  indicated excellent agreement between the two assessments [27]. A six-factor analysis with varimax rotation was performed to investigate the underlying domain structure of the Kazakh version of the female sexual function index (Kz-FSFI). t-test was used to determine the correlation between POP-Q findings and Kz-FSFI score. p-values less than 0.05 were deemed statistically significant.

## RESULTS

A total of 150 women participated in the study. The general (control) group comprised 110 healthy women, while the clinical (symptomatic) group included 40 women with POP-associated sexual dysfunctions. The average survey completion time was 27 minutes. Symptomatic women tended to be older than those in the control group. There was no significant difference in BMI between the two groups. The education level of participants was nearly equal in both groups (**Table 1**).

**Table 2.** Test-retest reliability scores & Cronbach's alpha statistic for variables of Kz-FSFI questionnaire

FSFI domains	Score range	ICC	Cronbach's alpha
Desire	1.2-6.0*	0.83	0.88
Arousal	0-6.0*	0.81	0.87
Lubrication	0-6.0*	0.74	0.95
Orgasm	0-6.0*	0.79	0.78
Satisfaction	0.8-6.0*	0.83	0.91
Pain	0-6.0*	0.77	0.88
Total score	2.0-36.0**	0.85	0.92

Note. FSFI: Female sexual function index questionnaire; \*Every domain score was calculated by adding scores of comprising items & multiplying sum by domain factor; & \*\*Total score is calculated by adding six domain scores

**Table 3.** Six-factor analysis using varimax rotation of Kz-FSFI items

Item	Subscale	F1	F2	F3	F4	F5	F6
1	Desire: Frequency	-	-	-	-	0.90	-
2	Desire: Level	-	-	-	-	0.58	-
3	Arousal: Frequency	-	-	-	-	-	0.84
4	Arousal: Level	-	-	-	-	-	0.82
5	Arousal: Confidence	-	-	-	-	-	0.71
6	Arousal: Satisfaction	-	-	-	-	-	0.88
7	Lubrication: Frequency	0.69	-	-	-	-	-
8	Lubrication: Difficulty	0.82	-	-	-	-	-
9	Lubrication: Frequency of maintaining	0.73	-	-	-	-	-
10	Lubrication: Difficulty in maintaining	0.91	-	-	-	-	-
11	Orgasm: Frequency	-	0.85	-	-	-	-
12	Orgasm: Difficulty	-	0.73	-	-	-	-
13	Orgasm: Satisfaction	-	0.67	-	-	-	-
14	Satisfaction: With amount of closeness with partner	-	-	-	0.78	-	-
15	Satisfaction: With sexual relationship	-	-	-	0.62	-	-
16	Satisfaction: With overall sex life	-	-	-	0.84	-	-
17	Pain: Frequency during vaginal penetration	-	-	0.81	-	-	-
18	Pain: Frequency following vaginal penetration	-	-	0.78	-	-	-
19	Pain: Level during or following vaginal penetration	-	-	0.66	-	-	-

Note. Only factors greater than 0.50 are represented; F1: Lubrication; F2: Orgasm; F3: Pain; F4: Satisfaction; F5: Desire; & F6: Arousal

Cronbach's alpha coefficient was used to assess the reliability of the instrument. The coefficient for the entire questionnaire was 0.92, while it was 0.88, 0.87, 0.95, 0.78, 0.91, and 0.88 for the six domains, respectively, demonstrating optimal internal consistency. Kz-FSFI exhibited excellent agreement between the two assessments (0.85) (Table 2).

Confirmatory factor analysis was employed to validate the given theoretically based factor structure. The six-factor model was deemed acceptable for structure validity analysis. The six identified factors corresponded to lubrication, orgasm, pain, satisfaction, desire, and arousal. All items exhibited a high correlation with their respective domain. The lowest convergent validity was observed for desire (0.58), and the highest for lubrication (0.91) (Table 3).

Lastly, the total and Kz-FSFI domain scores were compared to establish discriminant validity between the symptomatic and control groups. The results revealed significant differences in the "desire", "lubrication", "orgasm", and "satisfaction" domains, as well as the total score (Table 4, t-test).

**Table 4.** Correlation of Kz-FSFI domain's scores between symptomatic & control groups

FSFI domains	Mean±Standard deviation			p-value
	Symptomatic	Control		
Desire	3.74±1.02	5.21±1.21		***
Arousal	4.11±1.57	4.61±1.43		NS
Lubrication	3.09±0.16	4.56±0.91		***
Orgasm	3.87±1.84	5.83±0.26		***
Satisfaction	3.42±1.13	4.28±0.59		***
Pain	5.16±0.46	5.69±1.07		NS
Total score	23.39±6.18	30.18±5.47		*

Note. \*p<0.05; \*\*p<0.01; \*\*\*p<0.001; p-values were assessed using t-test between symptomatic & control groups; & NS: Not significant

## DISCUSSION

FSFI is a validated instrument designed to quantitatively measure SF and dysfunction. In order to facilitate its application in various countries, translation and validation of the translated versions are required. Numerous European (French, Greek, Hungarian, Italian, and Spanish) and Asian (Chinese, Iran, Japanese, and Urdu) nations have validated FSFI questionnaire, explored it in diverse groups, and compared results with other questionnaires [9, 13, 20, 28-32].

According to the Eastern cultural context in Kazakhstan, issues about the concept and sexual life probably exist among Kazakh individuals. Because studies on SF among the Kazakh population are lacking, using the validated specific tools may shed new light on the sexual issues of Kazakh women.

The primary objective of this research was to translate FSFI into Kazakh and evaluate the psychometric reliability and validity of the modified scale. This marks the first study to present results validating FSFI questionnaire in the Republic of Kazakhstan. In our investigation, Cronbach's alpha exceeded 0.7, demonstrating robust internal reliability of Kz-FSFI, and there was no necessity to eliminate questions. This implies that Kz-FSFI is acceptable for assessing SF among Kazakh women across the six domains. The research shows that test-retest reliability was affirmed with good to excellent ICCs, indicating a high reproducibility of Kz-FSFI over a two-week interval [13, 33]. Moreover, the confirmatory factor analysis results based on the six-factor model affirmed that all fit indices fell within the acceptable range, as in previous validation studies.

Our findings underscore the significant impact of POP-related issues on the quality of sexual life. Kz-FSFI scores were markedly lower in women with genital organ prolapse compared to the control group. Based on this discriminant validity analysis, it can be postulated that Kz-FSFI is also effective for detecting FSD. In terms of feasibility, the average administration time for Kz-FSFI questionnaire was 27 minutes. Comparable times were reported in the validation study of the Spanish version (Colombia) [34], whereas studies in China and Vietnam demonstrated that it takes approximately 15 minutes [12, 35].

This study does bear certain limitations. Firstly, our study population does not accurately represent the typical Kazakhstani female population, as the majority of respondents were highly educated women residing exclusively in urban areas. Secondly, our research sample was too small to calculate cutoff values for each Kz-FSFI domain for screening sexual disorders among Kazakh women. Additionally, future research involving sexologists must evaluate the applicability of the "desire" domain, as patients with desire disorders were

not identified in the current study. Despite these limitations, Kz-FSFI can be a valid and reliable instrument for research within the Kazakh population.

## CONCLUSIONS

Due to its strong psychometric characteristics, Kz-FSFI questionnaire is a valid and reliable tool for evaluating FSDs among sexually active Kazakh-speaking patients. It is designed to be easily administered and self-completed by women. Therefore, Kz-FSFI questionnaire can be effectively utilized in practical healthcare settings across Kazakhstan.

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**Declaration of interest:** No conflict of interest is declared by authors.

**Data sharing statement:** Data supporting the findings and conclusions are available upon request from the corresponding author.

## REFERENCES

1. WHO. Sexual health: Working definitions. World Health Organization; 2002. Available at: [http://www.who.int/reproductive-health/gender/sexual\\_health.html](http://www.who.int/reproductive-health/gender/sexual_health.html) (Accessed: 8 November 2013).
2. Nappi RE, Lachowsky M. Menopause and sexuality: Prevalence of symptoms and impact on quality of life. *Maturitas*. 2009;63(02):138-41. <https://doi.org/10.1016/j.maturitas.2009.03.021> PMID:19464129
3. Rosen R, Brown C, Heiman J, et al. The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther*. 2000;26:191-208. <https://doi.org/10.1080/009262300278597> PMID:10782451
4. Lewis RW, Fugl-Meyer KS, Corona G, et al. Definitions/epidemiology/risk factors for sexual dysfunction. *J Sex Med*. 2010;7(4 Pt 2):1598-607. <https://doi.org/10.1111/j.1743-6109.2010.01778.x> PMID:20388160
5. McCabe MP, Sharlip ID, Lewis R, et al. Risk factors for sexual dysfunction among women and men: A consensus statement from the fourth international consultation on sexual medicine. *J Sex Med*. 2016;13:153-67. <https://doi.org/10.1016/j.jsxm.2015.12.015> PMID:26953830
6. Verbeek M, Hayward L. Pelvic floor dysfunction and its effect on quality of sexual life. *Sex Med Rev*. 2009;7(4):559-64. <https://doi.org/10.1016/j.sxmr.2019.05.007> PMID:31351916
7. Mollaioli D, Ciocca G, Limoncin E, et al. Lifestyles and sexuality in men and women: The gender perspective in sexual medicine. *Reprod Biol Endocrinol*. 2020;18(1):10. <https://doi.org/10.1186/s12958-019-0557-9> PMID:32066450 PMID:PMC7025405
8. US Food and Drug Administration. Female sexual dysfunction: Clinical development of drug products for treatment. 2000. Washington, DC: US FDA.
9. Fakhri A, Pakpour AH, Burri A, Morshedi H, Zeidi IM. The female sexual function index: Translation and validation of an Iranian version. *J Sex Med*. 2012;9:514-23. <https://doi.org/10.1111/j.1743-6109.2011.02553.x> PMID:22146084
10. Sidi H, Abdullah N, Puteh SE, Midin M. The female sexual function index (FSFI): Validation of the Malay version. *J Sex Med*. 2007;4:1642-54. <https://doi.org/10.1111/j.1743-6109.2007.00476.x> PMID:17608666
11. Takahashi M, Inokuchi T, Watanabe C, Saito T, Kai I. The female sexual function index (FSFI): Development of a Japanese version. *J Sex Med*. 2011;8:2246-54. <https://doi.org/10.1111/j.1743-6109.2011.02267.x> PMID:21492402
12. Sun X, Li C, Jin L, Fan Y, Wang D. Development and validation of Chinese version of female sexual function index in a Chinese population—A pilot study. *J Sex Med*. 2011;8:1101-11. <https://doi.org/10.1111/j.1743-6109.2010.02171.x> PMID:21235720
13. ter Kuile MM, Brauer M, Laan E. The female sexual function index (FSFI) and the female sexual distress scale (FSDS): Psychometric properties within a Dutch population. *J Sex Marital Ther*. 2006;32:289-304. <https://doi.org/10.1080/00926230600666261> PMID:16709550
14. Baser RE, Li Y, Carter J. Psychometric validation of the female sexual function index (FSFI) in cancer survivors. *Cancer*. 2012;118:4606-18. <https://doi.org/10.1002/cncr.26739> PMID:22359250
15. Verit FF, Verit A. Validation of the female sexual function index in women with chronic pelvic pain. *J Sex Med*. 2007;4:1635-41. <https://doi.org/10.1111/j.1743-6109.2007.00604.x> PMID:17888066
16. Chang SR, Chang TC, Chen KH, Lin HH. Developing and validating a Taiwan version of the female sexual function index for pregnant women. *J Sex Med*. 2009;6:1609-16. <https://doi.org/10.1111/j.1743-6109.2009.01247.x> PMID:19473461
17. Maasoumi R, Rahimi F, Naghizadeh S. Translation and validation of Persian version of sexual function: Vaginal changes questionnaire (SVQ) for women with gynecologic cancers. *BMC Womens Health*. 2022;22(1):283. <https://doi.org/10.1186/s12905-022-01863-2> PMID:35804312 PMID:PMC9264581
18. Kazakhstan Bureau of National Statistics. Agency for strategic planning and reforms of the Republic of Kazakhstan Bureau of National Statistics. Available at: <https://www.stat.gov.kz/> (Accessed: 8 November 2013).
19. Basson R, Wierman ME, van Lankveld J, Brotto L. Summary of the recommendations on sexual dysfunctions in women. *J Sex Med*. 2010;7:314-26. <https://doi.org/10.1111/j.1743-6109.2009.01617.x> PMID:20092441
20. Chedraui P, Pe'rez-Lo'pez FR, Mezones-Holguin E, San Miguel G, Avila C. Assessing predictors of sexual function in mid-aged sexually active women. *Maturitas*. 2011;68(4):387-90. <https://doi.org/10.1016/j.maturitas.2010.12.004> PMID:21237590
21. Aslan E, Beji NK, Gungor I, Kadioglu A, Dikencik BK. Prevalence and risk factors for low sexual function in women: A study of 1,009 women in an outpatient clinic of a university hospital in Istanbul. *J Sex Med*. 2008;5(9):2044-52. <https://doi.org/10.1111/j.1743-6109.2008.00873.x> PMID:18564155

22. Esposito K, Ciotola M, Giugliano F, et al. Association of body weight with sexual function in women. *Int J Impot Res.* 2007;19(4):353-7. <https://doi.org/10.1038/sj.ijir.3901548> PMID:17287832
23. Wild D, Grove A, Martin M, et al. Principles of good practice for the translation and cultural adaptation process for patient-reported outcomes (PRO) measures: Report of the ISPOR task force for translation and cultural adaptation. *Value Health.* 2005;8(2):94-104. <https://doi.org/10.1111/j.1524-4733.2005.04054.x> PMID:15804318
24. Harvey M-A, Chih HJ, Geoffrion R, et al. International urogynecology consultation chapter 1 committee 5: Relationship of pelvic organ prolapse to associated pelvic floor dysfunction symptoms: Lower urinary tract, bowel, sexual dysfunction and abdominopelvic pain. *Int Urogynecol J.* 2021;32(10):2575-94. <https://doi.org/10.1007/s00192-021-04941-5> PMID:34338825
25. Bump RC, Mattiasson A, Bø K, et al. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. *Am J Obstet Gynecol.* 1996;175(1):10-7. [https://doi.org/10.1016/S0002-9378\(96\)70243-0](https://doi.org/10.1016/S0002-9378(96)70243-0) PMID:8694033
26. Fayers P, Machin D. *Quality of life: The assessment, analysis and interpretation of patient-reported outcomes.* John Wiley & Sons; 2007.
27. Bartko JJ. The intraclass correlation coefficient as a measure of reliability. *Psychol Rep.* 1966;19(1):3-11. <https://doi.org/10.2466/pr0.1966.19.1.3> PMID:5942109
28. Hock M, Farkas N, Tiringier I, Gitta S, Németh Z, Farkas B. Validation and translation of the Hungarian version of the female sexual function index (FSFI-H). *Int Urogynecol J.* 2019;30(12):2109-20. <https://doi.org/10.1007/s00192-019-04049-x> PMID:31359116 PMCID:PMC6861199
29. Zachariou A, Filiponi M, Kirana PS. Translation and validation of the Greek version of the female sexual function index questionnaire. *Int J Impot Res.* 2017;29(4):171-4. <https://doi.org/10.1038/ijir.2017.18> PMID:28424501
30. Filocamo MT, Serati M, Li Marzi V, et al. The female sexual function index (FSFI): Linguistic validation of the Italian version. *J Sex Med.* 2014;11(2):447-53. <https://doi.org/10.1111/jsm.12389> PMID:24224761
31. Wylomanski S, Bouquin R, Philippe HJ, et al. Psychometric properties of the French female sexual function index (FSFI). *Qual Life Res.* 2014;23(7):2079-87. <https://doi.org/10.1007/s11136-014-0652-5> PMID:24585184
32. Rehman KU, Asif Mahmood M, Sheikh SS, Sultan T, Khan MA. The female sexual function index (FSFI): Translation, validation, and cross-cultural adaptation of an Urdu version "FSFI-U". *Sex Med.* 2015;3(4):244-50. <https://doi.org/10.1002/sm2.77> PMID:26797057 PMCID:PMC4721033
33. Browne MW, Cudeck R. Alternative ways of assessing model fit. *Sociol Methods Res.* 1992;21(2):230-58. <https://doi.org/10.1177/0049124192021002005>
34. Vallejo-Medina P, Pérez-Durán C, Saavedra-Roa A. Translation, adaptation, and preliminary validation of the female sexual function index into Spanish (Colombia). *Arch Sex Behav.* 2018;47(3):797-810. <https://doi.org/10.1007/s10508-017-0976-7> PMID:28567567
35. Ho TTT, Le MT, Truong QV, Nguyen VQH, Cao NT. Validation of the Vietnamese translation version of the female sexual function index in infertile patients. *Sex Med.* 2020;8(1):57-64. <https://doi.org/10.1016/j.esxm.2019.09.004> PMID:31669053 PMCID:PMC7042161

## APPENDIX A (Interview questions - Kazakh version)

### ӘЙЕЛДЕРДЕГІ ЖЫНЫСТЫҚ ҚЫЗМЕТТІ БАҒАЛАУ ШКАЛАСЫ (KZ-FSFI)

**Нұсқаулық:** бұл сұрақтар Сіздің соңғы 4 аптадағы жыныстық қатынас кезіндегі сезімердіңіз бен реакцияларыңызға арналған. Өтініш, келесі сұрақтарға барынша ашық және нақты жауап беріңіз. Сіздің жауаптарыңыз қатаң құпия болып қалады. Осы сұрақтарға жауап бере отырып, келесі анықтамаларды есте сақтаңыз:

Сексуалды белсенділікке сүйіспеншілік, алдын-ала ойнау, мастурбация және вагинальды ену арқылы жыныстық қатынас кіруі мүмкін.

Жыныстық қатынас ер адам жыныс мүшесінің енуі ретінде анықталады.

Сексуалды ынталандыру серіктеспен алдын-ала ойнауды, өзін-өзі ынталандыруды (мастурбация) немесе эротикалық қиялдарды қамтиды.

#### Әр сұраққа тек бір квадратты белгілеңіз

Жыныстық құштарлық немесе жыныстық қатынасқа деген қызығушылық – бұл жыныстық қатынасқа деген құштарлық, серіктес тарапынан жыныстық қатынасқа деген сезімталдық және жыныстық қатынас туралы ой немесе қиял.

1. Соңғы 4 аптада Сіз жыныстық құштарлық немесе жыныстық қатынасқа деген қызығушылықты қаншалықты **жиі** сезіндіңіз?

Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

2. Соңғы 4 аптада Сіз жыныстық құштарлық немесе жыныстық қатынасқа деген қызығушылық **деңгейіңізді** (дәрежеңізді) қалай бағалар едіңіз?

Өте жоғары		5
Жоғары		4
Қалыпты		3
Төмен		2
Өте төмен немесе мүлдем жоқ		1

Жыныстық қозу – бұл физикалық және психикалық аспектілерді қамтитын сезім. Бұл жыныс аймағында қанның қызуы немесе толуы, жыныс жолдарынан бөліндінің болуы немесе бұлшықеттің жиырылуын қамтуы мүмкін.

3. Соңғы 4 аптада сексуалды белсенділік немесе жыныстық қатынас кезінде Сіз жыныстық қозуды қаншалықты **жиі** сезіндіңіз?

Жыныстық белсенділік болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

4. Соңғы 4 аптада сексуалды белсенділік немесе жыныстық қатынас кезінде Сіз жыныстық қозу **деңгейіңізді** қалай бағалар едіңіз?

Жыныстық белсенділік болған жоқ		0
Өте жоғары		5
Жоғары		4
Қалыпты		3
Төмен		2
Өте төмен немесе мүлдем жоқ		1

5. Соңғы 4 аптада Сіз сексуалды белсенділік немесе жыныстық қатынас кезінде жыныстық қозу пайда болатынына қаншалықты **сенімді** болдыңыз?

Жыныстық белсенділік болған жоқ		0
Өте сенімді		5
Сенімді		4
Орташа сенімді		3
Әлсіз сенімді		2
Айтарлықтай сенімді емес немесе мүлдем сенімді емес		1

6. Соңғы 4 аптада Сіз сексуалды белсенділік немесе жыныстық қатынас кезінде жыныстық қозу деңгейіңізбен қаншалықты **жиі** қанағаттандыңыз?

Жыныстық белсенділік болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

7. Соңғы 4 аптада Сіз сексуалды белсенділік немесе жыныстық қатынас кезінде жыныс жолдарынан **бөлінді болды ма?**

Жыныстық белсенділік болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

8. Соңғы 4 аптада Сіз сексуалды белсенділік немесе жыныстық қатынас кезінде жыныс жолдарынан бөліндінің шығуы қаншалықты **қиын** болды?

Жыныстық белсенділік болған жоқ		0
Мүлдем қиын немесе мүмкін емес		5
Өте қиын		4
Қиын		3
Аздап қиын		2
Қиындық туындаған жоқ		1

9. Соңғы 4 аптада жыныс жолдарынан бөліндінің шығу дәрежесі сексуалды белсенділік немесе жыныстық қатынастың соңына дейін қаншалықты жиі **қамтамасыз етіліп тұрды**?

Жыныстық белсенділік болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

10. Соңғы 4 аптада жыныс жолдарынан бөліндінің шығу дәрежесін сексуалды белсенділік немесе жыныстық қатынастың соңына дейін бірқалыпты қамтамасыз етіп тұру Сізге қаншалықты **қиын** болды?

Жыныстық белсенділік болған жоқ		0
Мүлдем қиын немесе мүмкін емес		5
Өте қиын		4
Қиын		3
Аздап қиын		2
Қиындық туындаған жоқ		1

11. Соңғы 4 аптада сексуалды ынталандыру немесе жыныстық қатынас кезінде Сіз оргазмға қаншалықты жиі қол жеткіздіңіз?

Жыныстық белсенділік болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

12. Соңғы 4 аптада сексуалды ынталандыру немесе жыныстық қатынас кезінде оргазмға қол жеткізу Сіз үшін қаншалықты **қиын** болды?

Жыныстық белсенділік болған жоқ		0
Мүлдем қиын немесе мүмкін емес		5
Өте қиын		4
Қиын		3
Аздап қиын		2
Қиындық туындаған жоқ		1

13. Соңғы 4 аптада Сіз сексуалды ынталандыру немесе жыныстық қатынас кезінде оргазмға қол жеткізе алу қабілетіңізге қаншалықты **қанағаттандыңыз?**

Жыныстық белсенділік болған жоқ		0
Өте қанағаттанарлық		5
Орташа қанағаттанарлық		4
Қанағаттанарлық деп те, қанағаттанарлық емес деп те айтуға тұрмайды		3
Орташа, алайда қанағаттанарлық емес		2
Мүлде қанағаттанарлық емес		1

14. Соңғы 4 аптадағы сексуалды белсенділік кезіндегі серіктесіңіз екеуіңіздің араларыңыздағы эмоционалды байланыстың күштілігіне қаншалықты **қанағаттандыңыз?**

Жыныстық белсенділік болған жоқ		0
Өте қанағаттанарлық		5
Орташа қанағаттанарлық		4
Қанағаттанарлық деп те, қанағаттанарлық емес деп те айтуға тұрмайды		3
Орташа, алайда қанағаттанарлық емес		2
Мүлде қанағаттанарлық емес		1

15. Соңғы 4 аптадағы жыныстық қатынасқа байланысты серіктесіңіз екеуіңіздің ара-қатынастарыңыз Сізді қаншалықты **қанағаттандырды?**

Жыныстық белсенділік болған жоқ		0
Өте қанағаттанарлық		5
Орташа қанағаттанарлық		4
Қанағаттанарлық деп те, қанағаттанарлық емес деп те айтуға тұрмайды		3
Орташа, алайда қанағаттанарлық емес		2
Мүлде қанағаттанарлық емес		1

16. Соңғы 4 аптадағы жыныстық өміріңіз Сізді қаншалықты **қанағаттандырды?** Бұл араға серіктестің қатысуынсыз жыныстық белсенділік те жатады.

Жыныстық белсенділік болған жоқ		0
Өте қанағаттанарлық		5
Орташа қанағаттанарлық		4
Қанағаттанарлық деп те, қанағаттанарлық емес деп те айтуға тұрмайды		3
Орташа, алайда қанағаттанарлық емес		2
Мүлде қанағаттанарлық емес		1

17. Соңғы 4 аптада Сіз вагинальды ену **кезінде** қаншалықты **жні** ыңғайсыздықты немесе ауырсынуды сездіңіз?

Жыныстық қатынас болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жні (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

18. Соңғы 4 аптада Сіз вагинальды енуден соң қаншалықты жиі ыңғайсыздықты немесе ауырсынуды сездіңіз?

Жыныстық қатынас болған жоқ		0
Әрдайым дерлік немесе әрқашан		5
Жиі (барлық уақыттың жартысынан көбі)		4
Кейде (барлық уақыттың жартысына жуығы)		3
Бірнеше рет (барлық уақыттың жартысынан азы)		2
Ешқашан дерлік немесе ешқашан		1

19. Соңғы 4 аптада Сіз вагинальды ену кезінде немесе одан кейін болған ыңғайсыздық немесе ауырсыну дәрежесін (деңгейін) қалай бағалар едіңіз?

Жыныстық қатынас болған жоқ		0
Өте жоғары		5
Жоғары		4
Орташа		3
Төмен		2
Өте төмен немесе мүлдем болған жоқ		1

*Сауалнаманы толтырғаныңызға рахмет*

## APPENDIX B (Interview questions - Original Version)

**Table A1.** Female Sexual Function Index (FSFI)

Question	Response Options
Q1: Over the past 4 weeks, how <b>often</b> did you feel sexual desire or interest?	5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never
Q2: Over the past 4 weeks, how would you rate your <b>level</b> (degree) of sexual desire or interest?	5 = Very high 4 = High 3 = Moderate 2 = Low 1 = Very low or none at all
Q3: Over the past 4 weeks, how <b>often</b> did you feel sexually aroused (“turned on”) during sexual activity or intercourse?	0 = No sexual activity 5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never
Q4: Over the past 4 weeks, how would you rate your <b>level</b> of sexual arousal (“turn on”) during sexual activity or intercourse?	0 = No sexual activity 5 = Very high 4 = High 3 = Moderate 2 = Low 1 = Very low or none at all
Q5: Over the past 4 weeks, how <b>confident</b> were you about becoming sexually aroused during sexual activity or intercourse?	0 = No sexual activity 5 = Very high confidence 4 = High confidence 3 = Moderate confidence 2 = Low confidence 1 = Very low or no confidence
Q6: Over the past 4 weeks, how <b>often</b> have you been satisfied with your arousal (excitement) during sexual activity or intercourse? Response Options	0 = No sexual activity 5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never
Q7: Over the past 4 weeks, how <b>often</b> did you become lubricated (“wet”) during sexual activity or intercourse?	0 = No sexual activity 5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never
Q8: Over the past 4 weeks, how <b>difficult</b> was it to become lubricated (“wet”) during sexual activity or intercourse?	0 = No sexual activity 1 = Extremely difficult or impossible 2 = Very difficult 3 = Difficult 4 = Slightly difficult 5 = Not difficult
Q9: Over the past 4 weeks, how often did you <b>maintain</b> your lubrication (“wetness”) until completion of sexual activity or intercourse?	0 = No sexual activity 5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never
Q10: Over the past 4 weeks, how <b>difficult</b> was it to maintain your lubrication (“wetness”) until completion of sexual activity or intercourse?	0 = No sexual activity 1 = Extremely difficult or impossible 2 = Very difficult 3 = Difficult 4 = Slightly difficult 5 = Not difficult
Q11: Over the past 4 weeks, when you had sexual stimulation or intercourse, how <b>often</b> did you reach orgasm (climax)?	0 = No sexual activity 5 = Almost always or always 4 = Most times (more than half the time) 3 = Sometimes (about half the time) 2 = A few times (less than half the time) 1 = Almost never or never

**Table A1 (continued).** Female Sexual Function Index (FSFI)

Question	Response Options
Q12: Over the past 4 weeks, when you had sexual stimulation or intercourse, how <b>difficult</b> was it for you to reach orgasm (climax)?	0 = No sexual activity 1 = Extremely difficult or impossible 2 = Very difficult 3 = Difficult 4 = Slightly difficult 5 = Not difficult
Q13: Over the past 4 weeks, how <b>satisfied</b> were you with your ability to reach orgasm (climax) during sexual activity or intercourse?	0 = No sexual activity 5 = Very satisfied 4 = Moderately satisfied 3 = About equally satisfied and dissatisfied 2 = Moderately dissatisfied 1 = Very dissatisfied
Q14: Over the past 4 weeks, how <b>satisfied</b> have you been with the amount of emotional closeness during sexual activity between you and your partner?	0 = No sexual activity 5 = Very satisfied 4 = Moderately satisfied 3 = About equally satisfied and dissatisfied 2 = Moderately dissatisfied 1 = Very dissatisfied
Q15: Over the past 4 weeks, how satisfied have you been with your sexual relationship with your partner?	5 = Very satisfied 4 = Moderately satisfied 3 = About equally satisfied and dissatisfied 2 = Moderately dissatisfied 1 = Very dissatisfied
Q16: Over the past 4 weeks, how <b>satisfied</b> have you been with your overall sexual life?	5 = Very satisfied 4 = Moderately satisfied 3 = About equally satisfied and dissatisfied 2 = Moderately dissatisfied 1 = Very dissatisfied
Q17: Over the past 4 weeks, how <b>often</b> did you experience discomfort or pain during vaginal penetration?	0 = Did not attempt intercourse 1 = Almost always or always 2 = Most times (more than half the time) 3 = Sometimes (about half the time) 4 = A few times (less than half the time) 5 = Almost never or never
Q18: Over the past 4 weeks, how <b>often</b> did you experience discomfort or pain following vaginal penetration?	0 = Did not attempt intercourse 1 = Almost always or always 2 = Most times (more than half the time) 3 = Sometimes (about half the time) 4 = A few times (less than half the time) 5 = Almost never or never
Q19: Over the past 4 weeks, how would you rate your <b>level</b> (degree) of discomfort or pain during or following vaginal penetration?	0 = Did not attempt intercourse 1 = Very high 2 = High 3 = Moderate 4 = Low 5 = Very low or none at all