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Translation and investigation of the psychometric properties of the revised female sexual distress scale among Iranian couples

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Women's sexual distress is often complicated by a combination of physical, psychological, and relational factors. Many women experience a cycle of dysfunction that affects not only their sexual health but also their overall quality of life and emotional well-being. The aim of this study was to determine the psychometric properties of the revised Female sexual distress scale (FSDS-R) among Iranian couples. During a methodological study conducted from April to July 2024, 400 Iranian couples were chosen using a convenience sampling method. The FSDS-R was translated and its psychometric properties were assessed through tests of construct validity, including exploratory and confirmatory factor analysis, convergent validity, and divergent validity. Additionally, the study examined the scale's internal consistency to confirm its reliability. The mean age of the participants was 37.95 (SD = 8.96) years. An exploratory factor analysis revealed two factors that accounted for 39.24% of the variance in 13 items. The confirmatory factor analysis confirmed that the data fit the model. The internal consistency for all factors was deemed acceptable, indicating good reliability and consistency in the constructs. The Persian version of the FSDS-R scale, with 13 items representing 39.24% of the variance, is a reliable and valid scale for measuring sexual distress in Iranian couples. This instrument can help healthcare programs identify and educate couples to reduce distress.

According to the definition of the World Health Organization sexual well-being includes physical, emotional, and social factors, however, more studies have focused on the physical aspect of sexual dysfunction[1,2]. Sexual distress is an essential criterion for diagnosing sexual dysfunction and is widely included in sexual health research[1,2]. Sexual distress is defined as a set of negative feelings such as worry, anxiety, and feelings of inadequacy that people have about their sex life and sexual relationships[3,4]. Female sexual distress is a common issue that affects many women across different cultures, including Iran. Studies indicate that a significant percentage of women experience sexual dysfunction, which often leads to distress. For example, a study found that 31.8% of married Iranian women reported experiencing sexual distress, influenced by factors such as marital satisfaction and sexual satisfaction[5]. This prevalence highlights the need for awareness and intervention. In Iran, cultural norms and values surrounding sexuality can impact women's experiences of sexual distress. Traditional views may lead to stigma around discussing sexual issues, making it difficult for women to seek help or express their concerns. This cultural backdrop can exacerbate feelings of isolation and distress related to sexual function[6]. Research shows that relationship satisfaction is closely linked to sexual well-being. Women in committed relationships often report higher levels of sexual satisfaction, while those with low relationship satisfaction are more likely to experience distress related to sexual difficulties[7]. Sexual distress can have broader implications for women's

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mental and physical health. It is associated with negative outcomes such as anxiety, depression, and reduced quality of life[8].

Research indicates that sexual dysfunction is prevalent among Iranian men, with estimates suggesting that between 10 and 25% experience some form of sexual problems. Specific disorders such as erectile dysfunction (ED) and premature ejaculation (PE) are notably common. A systematic review revealed that the pooled prevalence of ED in Iran is approximately 56.1%, which is significantly higher than global averages[9]. Additionally, PE has been reported as the most frequent sexual disorder among men in Iran, affecting a substantial portion of the population[10]. Cultural attitudes in Iran can make it difficult for women to openly discuss their needs in marriages, leading to challenges in the relationship. Research shows that the quality of marital relationships significantly impacts women's distress levels in Iran. Therefore, addressing female distress in Iran requires a culturally sensitive approach that recognizes societal influences and encourages open conversations about health within marriage[11,12].

The Sexual Distress Scale (SDS) can be used to assess sexual distress in women, men, and even prostate cancer survivors[13]. Sexual distress is associated with poorer sexual satisfaction, sexual performance, relationship quality, and mood states[14–16]. Therefore, its evaluation through screening can be very useful[17]. Previous studies suggest that sexual distress is a better indicator of quality of life than sexual function[18,19]. In addition, in the treatment of sexual dysfunction, the outcome of the treatment reported by the patient is very important, which shows the importance of reporting by the patient with reliable and validated tools[4,20,21].

The Female Sexual Distress Scale (FSDS) is a 12-item scale that assesses sexual distress independent of domains of sexual functioning (e.g. distress about sex life)[22,23]. This scale was revised in 2008 and an item was added to assess low libido distress (FSDS-R)[24]. A Likert scale is used to score the FSDS-R, which ranges from 0 (never) to 4 (always). The total score ranges from 0 to 52, with higher scores indicating higher sexual distress. The FSDS-R is reliable and valid for assessing sexual distress in women and differentiates between women with and without sexual dysfunction[13,25].

Because of its lack of gender-specific content, the FSDS has been used in samples of men. More recently, the FSDS and FSDS-R have been validated for use in men with normal and dysfunctional sexual function (in men, the scale is called the SDS and the Revised Sexual Distress Scale [SDS-R], respectively), so that have had good internal consistency, test-retest reliability, and construct validity. The study of Santos Iglesia and colleagues showed that the SDS and SDS-R scales can be used to assess sexual distress in samples of men with prostat cancer and with and without sexual dysfunction[26]. Thus, the strengths of the SDS and SDS-R include strong psychometric properties that support use in men and women.

To ensure an accurate definition of sexual disorders as well as to assess and compare its prevalence in the population, the presence of sexual distress should be assessed when conducting epidemiological studies[22,25,27]. However, it is not recommended to generalize the results of epidemiological studies on sexual distress to all societies and cultures[28]. For example, Bruto argued that the DSM is primarily based on Western populations and therefore does not consider some syndromes and conditions affecting sexuality that may be much more common in other cultures[29]. Given this, the availability of culturally appropriate questionnaires that allow for the assessment of sexuality-related distress is crucial.

Azimi Neko et al. (2014) determined the psychometric properties of the Iranian version of the FSDS-R[30]. Given that the psychometric results of a scale vary across cultures and populations, and that psychometric testing of the sexual distress scale has not been conducted for men in Iran, this study aimed to translate and psychometrically test the revised sexual distress instrument in Iranian couples.

Methods

This methodological study was conducted from July to September 2024. A couple who had been referred to a doctor at a health center in Urmia city, Iran, were recruited to participate in this study. The participants were selected using an available sampling method. The original scale, developed by DeRogatis et al. in North America[24] was translated into Persian for this study, and its psychometric properties were assessed.

Inclusion and exclusion criteria

The criteria for inclusion in this study are as follows: couples who are enrolled in comprehensive health centers and are willing to participate; married and potentially active individuals over the age of 18 who can read, write, speak, and understand Farsi; absence of chronic diseases such as diabetes, cardiovascular disease, high blood pressure, kidney failure, or cancer; not taking antihypertensive drugs, antidepressants, antihistamines, or benzodiazepines; no alcohol addiction or drug abuse; no depression based on the Hospital Anxiety and Depression Scale (HADS); not using antipsychotic drugs; women not using LD pills, pregnant, or having undergone hysterectomy, mastectomy, colostomy, or oophorectomy; and a body mass index (BMI) of ≥ 30 kg/m2. The criterion for exclusion is non-completion or incomplete completion of the questionnaire.

Sample size

MacCallum et al. recommended a minimum sample size of 200 cases for psychometric studies[31]. In order to ensure construct validity with two separate samples, we invited 400 individuals to participate in our study. In this study, the sampling process involved two distinct phases:

Exploratory factor analysis (EFA): We initially recruited 100 couples (100 men and 100 women) to conduct the exploratory factor analysis. This phase was essential for identifying the underlying structure of the FSDS-R and ensuring its relevance to our population.

Confirmatory factor analysis (CFA): Following the EFA, we included an additional 100 couples (again, 100 men and 100 women) for confirmatory factor analysis. This second phase aimed to validate the factor structure identified in the exploratory phase and further assess the scale's reliability and validity.

By maintaining equal representation of men and women in both phases, we ensured that our findings could be generalized to both genders. This study examined the demographic characteristics of participants, including age, age at marriage, Job, education level, economic status, child number and fertility.

The original version of the questionnaire

The sexual distress scale is a 13-item assessment tool designed to measure distress levels independent of various aspects of functioning, such as distress related to life circumstances. In 2008, the scale was updated to include an additional item specifically targeting distress related to low libido, known as the FSDS-R. This revised version of the scale utilizes a Likert scale that ranges from 0 (never) to 4 (always), with total scores falling between 0 and 52. Higher scores on the FSDS-R indicate higher levels of distress. The study included 296 women between the ages of 18 and 50. The Intraclass Correlation Coefficient (ICC) was found to be greater than 0.74, and the Cronbach's alpha coefficient was greater than 0.86[24].

Two phases of research were conducted to evaluate the psychometric properties and effectiveness of the female distress scale in women diagnosed with hypoactive sexual desire disorder (FSDS-R).

Phase I

Translation

To conduct this study, we obtained written permission from the questionnaire developer to utilize the FSDS-R scale. The scale was then translated from English to Persian following a translation protocol by Gudmundsson[32]. Two proficient translators independently translated the FSDS-R into Persian. An expert panel, which included some of the authors of this article and two professional translators, meticulously reviewed and merged the two translations to produce a Persian version of the FSDS-R. Subsequently, a Persian-English translator was enlisted to translate the Persian version of the FSDS-R back into English. The expert panel then reviewed and approved this final version.

Phase II

Normal distribution, outliers, and missing data

Skewness (± 3) and kurtosis (± 7) were utilized to individually analyze the distribution of data. Furthermore, multivariate normality was assessed by calculating the Mardia coefficient of multivariate kurtosis (< 8). The Mahalanobis d-squared ($p < 0.001$) was employed to detect any multivariate outliers[33]. EFA was conducted using the pairwise deletion method to handle missing data[34].

Construct validity

The first dataset underwent Maximum Likelihood Exploratory Factor Analysis (MLEFA) with Promax rotation. MLEFA aims to determine the factor loadings and unique variances that best explain the observed correlation matrix among variables, especially when the data is normally distributed. This method allows for the computation of goodness-of-fit indices and significance testing of factor loadings. The estimation process involves solving complex equations iteratively to maximize the likelihood of observing the data under the assumed model[35].

Promax Rotation is applied after extracting factors using ML to simplify and make the factor structure more interpretable. Unlike orthogonal rotations, Promax allows for factors to be correlated with each other, leading to more realistic representations in social sciences where factors often interact[36]. A Kaiser-Meyer-Olkin (KMO) measure above 0.8 and a significant Bartlett's test of sphericity ($p < 0.001$) were utilized to validate the suitability of the data for factor analysis[37]. Additionally, parallel analysis (PA) was conducted to ascertain the number of factors present in the dataset.PA is a statistical technique that helps determine the number of factors to retain in EFA. It involves generating random datasets through Monte Carlo simulations and comparing eigenvalues to identify statistically significant factors. PA is considered more robust and objective than traditional methods, reducing the risk of chance factors[38]. The factor extraction process employed eigenvalues greater than 1, communalities greater than 0.2, and factor loadings greater than 0.3[39]. This method ensured that only significant factors were considered in the analysis[40]. Eigenvalues (λ) are calculated by summing the squared factor loadings for all items within each factor. This value indicates the extent to which the variance in each item can be accounted for by the analysis. To determine the proportion of total variance explained by a factor, the Eigenvalue is divided by the total number of items[38]. The MLEFA was performed using SPSS version 27.

The next step involved analyzing and confirming the factor structures identified through MLEFA by conducting CFA using AMOS version 27 with a second random dataset of 200 participants. Various model fit indices, such as the Comparative Fit Index (CFI), Normed Fit Index (NFI), Goodness of Fit Index (GFI), Relative Fit Index (RFI), and Incremental Fit Index (IFI), were utilized to assess the model fit, all of which were above 0.9. Additionally, the Root Mean Square Error of Approximation (RMSEA) was below 0.08, and the Minimum Discrepancy Function divided by degrees of freedom (CMIN/DF) was less than 3, indicating a strong model fit[37].

Convergent and discriminant validity

In order to evaluate the convergent and discriminant validity of the study, specific criteria were employed. For convergent validity, it was required that the composite reliability[15] exceed 0.7, and the average variance extracted[33] be greater than 0.5 for each construct. Fornell and Larcker (1981) suggested that if the AVE falls below 0.5 for a psychological construct, but the CR is above 0.7, the convergent validity can still be considered acceptable[41]. To establish discriminant validity, the study utilized the Heterotrait-Monotrait Ratio (HTMT) correlation criterion. According to this criterion, the HTMT ratio between all constructs should be below 0.85. The HTMT is a measure used to evaluate divergent validity in structural equation modeling and psychometric assessments. It compares the correlations between different constructs (heterotrait) to the correlations within the same construct (monotrait). A lower HTMT value suggests better divergent validity[42].

Convergent validity is about how different measurements of the same thing match up. If the AVE is greater than 0.50, it means the measurements explain more than half of the variance and are likely measuring the same thing. Divergent validity, on the other hand, is about ensuring that different concepts are actually different in practice even if they are related in theory. It is confirmed when the square root of the AVE for one construct is greater than its correlation with other constructs, showing that it is uniquely measuring what it is meant to measure[43].

Reliability

Various statistical measures, including Cronbach's alpha (α), McDonald's omega (Ω), average inter-item correlation coefficient (AIC), Composite Reliability, and maximum reliability (MaxR), were utilized to assess the internal consistency and reliability of the construct[44,45]. If the values of Cronbach's alpha, McDonald's omega, CR, and MaxR for the scale exceed 0.7, and AIC values fall between 0.2 and 0.4, it is considered to demonstrate acceptable reliability[46].

Results
Demographic characters

The mean age of the participants was 37.95 (SD = 8.96) and the marriage age was 24.88 (SD = 4.55) years. Out of the total participants, 50% were women and 50% were men, totaling 200 participants of each gender (Table 1).

The results of MLEFA

The MLEFA with Promax and Kaiser Normalization rotation was conducted on the initial random dataset consisting of 200 observations. This analysis revealed the presence of two distinct factors that collectively accounted for 39.24% of the variance observed across the 13 items under consideration. Furthermore, the KMO measure of sampling adequacy yielded a value of 0.916, indicating that the dataset was well-suited for factor analysis. Additionally, Bartlett's test of sphericity, with a significance level of $p < 0.001$ and a Chi-square value of 2750.566 (df = 78), further supported the appropriateness of the dataset for factor analysis. For a more comprehensive overview of the results obtained from the MLEFA, please refer to Table 2. The Semantic Descriptions of Items from the FSDS-R scale presented in Table 3.

The results of CFA

The CFA was conducted to validate and confirm the factor structure derived from MLEFA using a separate random dataset consisting of 200 participants. The results of the analysis indicated a good fit of the data to the model, with a χ^2 (132) value of 141.463 and $p < 0.001$. Additionally, the CMIN/DF was found to be 2.397, CFI = 0.933, IFI = 0.933, TLI = 0.911, NFI = 0.913, RFI = 0.885, PNFI = 0.691, and RMSEA with a 90% Confidence Interval of 0.048 [0.047, 0.075]. The results of the CFA model are visually represented in Fig. 1.

Variables		N (%)
Age (year)		37.95 ± 8.96
Marriage age (year)		24.88 ± 4.55
Gender	Female	200 (50.0)
	Male	200 (50.0)
Job	Freelance job	120 (30.0)
	Employee	149 (37.3)
	Housekeeper job	114 (28.5)
	Retired	12 (3.0)
	Unemployed	5 (1.3)
Education level	Under diploma	28 (7.0)
	Diploma	187 (46.8)
	Higher than diploma	185 (46.3)
Economic situation	Poor	122(30.6)
	Medium	210(52.5)
	Rich	68(17.0)
Child num	Non	79 (19.8)
	One	130 (32.5)
	Two	151(37.8)
	Three	36(9.0)
	Four	4(1.0)
Infertility	Yes	23 (5.8)
	No	377(94.3)

Table 1. Demographic characteristics of participants ($N = 400$).

Factor	Items, how often did you feel	Factor loading	h²	λ	% variance
Sexual distress and dissatisfaction	Q4. Frustrated by your sexual problems.	0.927	0.662	2.983	22.94%
	Q5. Stressed about sex.	0.735	0.522		
	Q2.Unhappy about your sexual relationship.	0.610	0.640		
	Q1.Distressed about your sex life.	0.538	0.507		
	Q8.Sexually inadequate.	0.537	0.293		
	Q9. Regrets about your sexuality.	0.505	0.432		
	Q13.Bothered by low sexual desire.	0.438	0.570		
	Q11.Dissatisfied with your sex life.	0.435	0.540		
Sexual well-being distress	Q3.Guilty about sexual difficulties.	0.910	0.628	2.119	16.3%
	Q7.Worried about sex.	0.775	0.604		
	Q12.Angry about your sex life.	0.544	0.619		
	Q6.Inferior because of sexual problems.	0.483	0.377		
	Q10.Embarrassed about sexual problems.	0.404	0.232		

Table 2. The result of EFA on Persian version of the revised women's sexual distress scale ($N = 200$). h2: Communalities, λ: Eigenvalues.

Factor	Semantic descriptions of items from the female sexual distress scale
Sexual distress and dissatisfaction	Q4. This item has the highest factor loading, suggesting it is the most significant indicator of sexual distress within this scale. It implies that feelings of frustration are central to women's experiences of sexual dissatisfaction.
	Q5. With a strong loading, this item indicates that stress related to sexual experiences is also a prominent feature of sexual distress. This suggests that anxiety surrounding sexual performance or encounters significantly contributes to overall distress.
	Q2. This item reflects general unhappiness in sexual relationships, showing a moderate correlation with the construct. It highlights that relational satisfaction plays a role in sexual distress.
	Q1. This item indicates a direct acknowledgment of distress regarding one's sex life, reinforcing the notion that overall dissatisfaction is an important aspect of sexual health.
	Q8. Feelings of inadequacy in sexual performance or appeal are captured here, suggesting that self-perception significantly impacts distress levels.
	Q9. This item indicates that regrets concerning one's sexual experiences or choices contribute to distress, reflecting on the psychological burden associated with past decisions.
	Q13. While this item has a lower loading compared to others, it still signifies that issues related to desire can contribute to feelings of distress, albeit to a lesser extent than other factors.
	Q11. Similar to Q2, this item emphasizes dissatisfaction but with slightly less impact on the overall construct of sexual distress.
Sexual well-being distress	Q3. Feeling guilty about difficulties indicates guilt from perceived failures in meeting expectations or norms, leading to distress and anxiety.
	Q7. Worrying about encounters or performance stems from concerns about ability, partner satisfaction, or the implications of dysfunction, adding to overall distress.
	Q12. Anger about life reflects frustration from unmet expectations, dissatisfaction, or relational issues, creating a significant emotional burden.
	Q6. Feeling inferior due to problems affects self-esteem and body image, reinforcing negative perceptions about oneself as a partner and impacting mental health.
	Q10. Embarrassment about problems leads to avoidance of discussing health issues and reluctance to seek help, worsening distress.

Table 3. Item-level semantic analysis of the female sexual distress scale.

Convergent and discriminant validity and reliability

The study revealed that the Average Variance Extracted for the first factor related to women's distress was 0.5. Although the AVE for the second factor was lower than 0.5, the Max R, CR, and McDonald's omega values were all above 0.7, indicating acceptable convergent validity.

In terms of discriminant validity, the results of the HTMT ratio were below 0.9,

(0.887)demonstrating good discriminant validity for the two factors. Furthermore, Cronbach's alpha, McDonald's omega, CR, and Max R values for all factors were above 0.7, while the AIC was higher than 0.2, suggesting strong internal consistency and construct reliability (see Table 4).

Discussion

Women's sexual distress is often complicated by a combination of physical, psychological, and relational factors. many women experience a cycle of dysfunction that affects not only their sexual health but also their overall quality of life and emotional well-being[47]. This study focused on assessing of psychometric properties of the revised women's sexual distress scale among Iranian couples.

The study found that only 39.24% of the total variance in the RFDS could be accounted for by the two factors identified in the EFA. This suggests that significant factors impacting distress may not have been addressed in the study, highlighting the complexity of distress as a concept influenced by various psychological, relational, and cultural variables. Future research should consider exploring additional dimensions of distress using qualitative
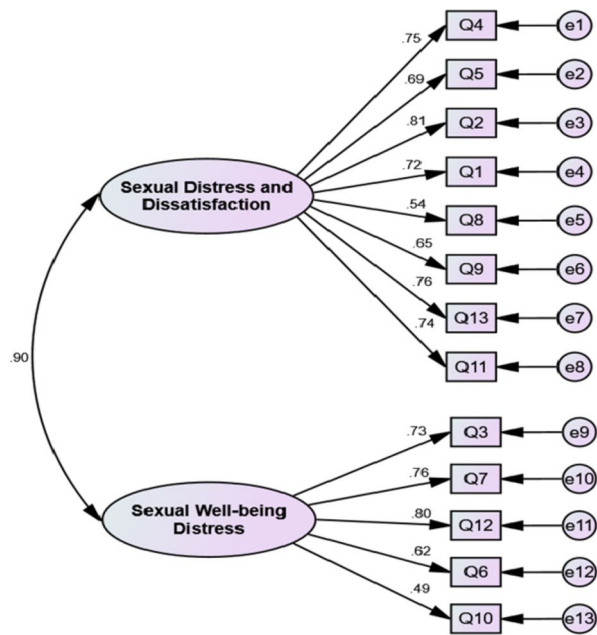
Fig. 1. First order CFA of Persian version of the revised women's sexual distress scale ($n = 200$).

Factors	α	Ω	CR	MaxR	AVE	AIC
Sexual distress and dissatisfaction	0.887	0.892	0.888	0.896	0.500	0.499
Sexual well-being distress	0.809	0.815	0.821	0.849	0.485	0.468

Table 4. The results of the convergent and divergent validity and construct reliability ($n = 200$). α: Cronbach's alpha, Ω: McDonald's omega.

or broader quantitative methods to improve the scale's validity and applicability in different populations and settings.

Several factors may influence sexual distress among Iranian couples, reflecting a complex interplay of cultural, psychological, and relational dynamics. Key influences include:

Cultural norms and taboos: In Iran, discussions surrounding sexuality are often stigmatized, leading to a lack of open communication about sexual needs and issues. This cultural context can result in feelings of shame and guilt related to sexual expression, which may contribute to heightened sexual distress among women[48,49].

Education and awareness: A significant gap in sexual education exists in Iran, where many women lack formal training regarding their sexual health and pleasure. This lack of awareness can lead to misconceptions about sexual function and contribute to feelings of inadequacy or distress[48,50].

Marital dynamics: The quality of the marital relationship plays a crucial role in influencing sexual satisfaction and distress. Factors such as intimacy, communication skills, and mutual understanding between partners are essential for a fulfilling sexual relationship. Marital conflicts often arise from unmet sexual needs, which can exacerbate feelings of distress[5,51].

Psychological factors: Psychological issues such as anxiety, depression, and past trauma can significantly impact women's sexual health. These factors may lead to diminished sexual desire or dysfunction, further contributing to sexual distress[48,50].

Socioeconomic status: Economic pressures and instability can affect relationship dynamics and individual well-being, potentially leading to increased stress and reduced sexual satisfaction. Research indicates that economic problems are closely linked with marital dissatisfaction and divorce rates in Iran[49].

Infertility: In Iranian culture, where childbearing is highly valued, infertility can be a significant source of distress for women. The societal emphasis on motherhood may lead to feelings of inadequacy and reduced sexual desire among infertile couples[48].

Substance abuse: The presence of substance abuse within the relationship can create additional stressors that negatively impact sexual satisfaction and overall relationship quality[49].

Distress among Iranian couples is influenced by cultural norms, lack of education and awareness about sexual health, marital dynamics, psychological issues, socioeconomic status, infertility, and substance abuse. Cultural stigmas around discussing sex, lack of formal education on sexual health, and marital conflicts can contribute to feelings of shame and guilt, inadequacy, and distress in women. Psychological issues like anxiety and depression, as well as economic pressures and infertility, can also impact women's health and desire, leading to increased

distress. Additionally, substance abuse within the relationship can create additional stressors that can negatively affect relationship satisfaction.

This discovery mirrors that of the original study[24], with only slight variations in factor loadings and item placement within the factors. These differences can be attributed to the unique characteristics of the studied population and the cultural backgrounds of the participants. Other studies assessing the psychometric properties of the Iranian version of the FSDS-R found that it yielded a single-factor model with an acceptable fit, which is different from the findings of this study[30,52]. This discrepancy may highlight variations in how sexual distress manifests across different populations or contexts. In contrast to findings of this study, another research identified six factors accounting for 51.92% of variance in assessing female quality of sexual life[53]. This suggests that while this study's two-factor model provides valuable insights, other studies may reveal more complex structures influencing sexual distress, potentially due to different methodologies or sample characteristics. In another study, the Sexual Distress Scale was adapted and validated, comprising 15 items across three dimensions: sexual self-esteem, depression, and sexual anxiety. This study highlighted the multifaceted nature of sexual distress, which may differ from the two-factor model identified in this study. The variance explained was not explicitly stated but emphasizes that cultural contexts significantly shape the dimensions of sexual distress[54].

The first factor in the revised women's distress scale was identified as "Sexual distress and Dissatisfaction". Sexual distress is characterized by feelings of frustration, anxiety, and worry regarding sexual activity. It can manifest as negative emotions about one's sexuality, which may adversely affect overall well-being and quality of life[5,55]. Given that extracted items in the first factor, the most significant indicator was frustration, followed by stress, unhappiness in relationships, overall life dissatisfaction, feelings of inadequacy, regrets, low desire, and dissatisfaction with life. These factors all play a role in contributing to distress levels in women. Research indicates that while many individuals may experience sexual difficulties, only a minority report high levels of distress associated with these issues. Factors such as attachment style and relational intimacy also play a role in how distress is experienced[55]. Cultural factors play a significant role in shaping men's experiences with sexual distress in Iran. The prevailing social norms often discourage open discussions about sexuality, leading to stigma and shame surrounding sexual problems. This cultural silence can prevent men from seeking help or expressing their concerns about sexual health, exacerbating feelings of distress and isolation[56]. Furthermore, the socio-cultural changes in contemporary Iranian society, including shifts in attitudes towards sexuality and relationships, can impact men's sexual health. As younger generations navigate these changes, they may face increased pressures related to sexual performance and expectations, contributing to distress[9]. Male sexual distress can have profound implications for intimate relationships. When men experience sexual dysfunction, it can lead to decreased relationship satisfaction for both partners. Issues such as ED or PE may create anxiety and tension within couples, affecting communication and intimacy[56].

Sexual dissatisfaction refers to a broader sense of fulfillment regarding one's sexual experiences. This can manifest as unhappiness with the frequency of sexual activity, the quality of sexual encounters, or issues related to achieving orgasm. There is a strong correlation between sexual satisfaction and overall satisfaction with marital life[57]. Items related to the first factor collectively reflect the emotional and psychological challenges individuals face regarding their sexual health and relationships, this issue highlights the importance of addressing emotional well-being alongside physical aspects of sexuality. Healthcare organizations have the ability to provide interventions that focus on training couples to address the emotional, psychological, and physical complications associated with sexual distress and dissatisfaction. By implementing these interventions, organizations can effectively decrease the levels of distress and dissatisfaction experienced by couples.

The second factor in the revised women's distress scale is sexual well-being distress, which refers to the psychological and emotional experience of concern, anxiety, and frustration about one's life. It is closely linked to dysfunction and is a critical component of health. Well-being distress often manifests as feelings of frustration and dissatisfaction with functioning, impacting an individual's quality of life and potentially leading to mental health issues like depression and anxiety[58,59]. Worry and rumination, which are patterns of repetitive negative thinking, are linked to higher levels of distress and can make feelings of anxiety worse[59,60]. Items related to the second factor highlight the emotional struggles individuals face regarding their sexuality, emphasizing the impact of negative self-perception on sexual well-being. This highlights the importance of addressing emotional well-being in therapeutic contexts aimed at improving sexual health. Additionally, to reduce sexual well-being distress, individuals can use mindfulness practices like meditation, communicate openly with partners to alleviate feelings of isolation, and engage in regular physical exercise to boost mood and reduce stress[61,62]. By integrating these strategies, individuals can effectively manage sexual well-being distress.

The results of the CFA indicated that the model fit the data effectively, indicating that the factor structure identified in the MLEFA was upheld by the new dataset. The outcomes of this research imply that the items in FSDS-R exhibit robust convergent and divergent validity across all constructs. Divergent validity signifies a clear differentiation between various constructs, whereas convergent validity is evident when the elements of a construct are closely interrelated in meaning and account for variance[63]. A study conducted in Canada has confirmed the reliability of the FSDS-R, highlighting its strong psychometric properties in distinguishing between women with different levels of dysfunction. This research demonstrated both convergent and divergent validity by establishing significant correlations between FSDS-R scores and measures of function, while also showing that the FSDS-R remains distinct from unrelated constructs[64]. This supports findings of this study that items within the FSDS-R exhibit robust validity across constructs. The results strongly indicate that the items within each factor are closely related and effectively evaluate the concept of sexual distress in couples. Additionally, they demonstrate that the factors assessed by this scale are unique and gauge different aspects of sexual distress in couples, thus supporting the notion that FSDS-R possesses divergent validity.

The internal consistency coefficient of FSDS-R suggests that the items within each factor are strongly interrelated, implying that they measure the same construct and that the factors exhibit high reliability. Research

conducted in Spain validated the FSDS-R among Spanish-speaking women also demonstrated strong internal consistency and significant correlations with measures of psychological well-being, reinforcing the multifaceted nature of sexual distress in different cultural context[65].

Conclusion
The scale consists of two factors containing a total of 13 items, which collectively account for 39.24% of the total variance in the Persian version of sexual distress among Iranian couples. The findings affirm the appropriateness of employing the Persian iteration of the FSDS-R as a dependable and valid instrument for assessing sexual distress in couples. P-FSDS-R is a psychometrically sound instrument that provides a comprehensive assessment of sexual distress in couples. It can help healthcare programs identify and provide contexts for educating couples to reduce sexual distress.

Limitations and strengths
One limitation of this study is its cross-sectional design, which restricts our ability to draw causal inferences or observe changes in sexual distress over time. Future research employing a longitudinal approach would be beneficial to better understand the dynamics and temporal aspects of sexual distress among Iranian couples. The study on distress measurement in Iran may be influenced by cultural biases and reliance on self-reported measures. The sample size, though suitable for factor analysis, may not fully represent diverse demographics in Iran, limiting generalizability. Despite providing valuable insights, these limitations need to be considered when applying the study's findings more broadly. The reliance on self-reported measures can introduce bias, as participants may underreport or over report their levels of distress due to social desirability or stigma associated with sexual issues. In simpler terms, the study had a diverse group of participants that accurately represented the target population. They used advanced statistical methods to confirm the reliability of their measurement tool for distress in Iranian couples, showing strong consistency and validity.

Future research directions
While our study provides important insights into the psychometric properties of the FSDS-R among Iranian couples, we recognize that the findings may not be directly applicable to other populations due to varying cultural and socio-economic contexts. This limitation highlights the need for further research to evaluate the FSDS-R across diverse demographics. Such studies would not only validate our findings but also contribute to a more comprehensive understanding of female sexual distress globally, ensuring that interventions can be tailored to meet the needs of different cultural groups.

In light of the findings from our study, several areas warrant further exploration:

Cultural comparisons: Future research could investigate the psychometric properties of the Revised Female Sexual Distress Scale in diverse cultural contexts within Iran and other countries, allowing for a broader understanding of sexual distress across different populations.

Longitudinal studies: Longitudinal research is needed to examine how female sexual distress evolves over time, particularly in relation to significant life events such as marriage, childbirth, and aging.

Intervention studies: Investigating the effectiveness of specific interventions aimed at reducing sexual distress among women could provide valuable insights into practical solutions for enhancing sexual health.

Men's perspectives: Future studies should also consider exploring male partners' perspectives on female sexual distress and its impact on relationship dynamics, which could contribute to a more comprehensive understanding of sexual health within couples.

Implications
This study validated a culturally adapted version of the FSDS-R for assessing distress among Iranian couples. The high prevalence of dysfunction in this population shows the importance of addressing health issues comprehensively, as they can impact marital satisfaction and overall well-being. The study's findings can inform interventions to improve health literacy and address dysfunction, leading to healthier relationships and better mental health outcomes. Further research is needed to explore factors influencing distress in diverse populations and emphasize culturally sensitive approaches in health assessments.

Data availability
The data used and analyzed during the current study are available from the corresponding author upon reasonable request.

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Declarations

Competing interests
The authors declare no competing interests.

Ethics approval and consent to participate
The Ethics Committee of Urmia University of Medical Sciences gave its approval to this study (Approval code: IR.UMSU.REC.1402.165). The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. When distributing the questionnaire of this study, the study's goals were clearly communicated to participants. They were informed that their participation in the study was voluntary and that their data would be kept confidential. Informed consent to participate in the study was obtained from all participants.

Additional information
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