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# Psychometric properties of the sexual five-facet mindfulness questionnaire (FFMQ-S): validation among a community sample of Persian-speaking women.

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## Research Article

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# Abstract

## Purpose

Sex is one of the most important relationships in people's lives, and mindfulness during sex helps to improve sex. This study validated the Persian version of the Sexual mindfulness Scale (FFMQ-S).

## Methods

A sample of 668 Persian-speaking women (ages = 19–61) were selected by multi-stage cluster sampling. Data collection tools were Sexual Five Facets Mindfulness Questionnaire (FFMQ-S), short form of marital instability questionnaire (MI) and Sexual Satisfaction Questionnaire (ISS).

## Results

Data analysis was performed by SPSS26 and AMOS24 software using descriptive statistics and confirmative factor analysis (Cronbach's alpha, Pearson correlation and construct validity and reliability). The factor structure of FFMQ-S, which has five factors was confirmed. Cronbach's alpha was .89 for the whole questionnaire and for observing, describing, acting with awareness, nonjudging of inner experience, nonreactivity to inner experience were .58, .77, .78, .64 and .80, respectively and the reliability of the construct and five factors was confirmed. Fit indices (GFI = .9, IFI = .9, CFI = .9, CMIN/df = 4.62) were in acceptable range.

## Conclusion

The results in the analysis confirmed the reliability of psychometric properties of the FFMQ-S. The FFMQ-S version translated into Persian can be used as a valid tool to measure the mindfulness in sexual interactions and treatment clinics of Iran.

## Introduction

According to recent studies, it shows that more than one-third (38–51%) of women suffer from sexual difficulties [1]. Sexual difficulties reduce marital satisfaction and life satisfaction and endanger people's mental health [2]. Many women express they have trouble getting into orgasm and some have never gotten into orgasm. Anorgasmia, often known as orgasmic disorders, is the second most prevalent sexual issue among women [3]. The problem of low sexual desire and arousal disorders are a very prevalent ailment in women. One of the main known causes of women's sexual problems can be psychological processes such as disturbing thoughts or lack of concentration, which play an important role in reducing women's sexual experience [4, 5]. In recent years, researchers have begun to investigate the positive effects of regular mental meditation such as mindfulness in the treatment of sexual disorders [6, 8].

Mindfulness-based interventions (MBIs) have been particularly effective in treating sexual difficulties in women [9,11]. Therefore, in order to advance the goal of improving the quality of sexual relations in women through mindfulness, there was a need for a tool that was specifically designed in the field of sexual relations.

Mindfulness is defined as the ability to pay attention to experiences in the present moment in a non-judgmental manner [12]. Mindfulness originates from Buddhism and means "clear awareness". This practice mostly existed in Mahayana (Zen) and Theravada Buddhist spiritual practices and is known as "mindfulness meditation" in Western culture [12]. Bishop et al [13] and Dimidjian & Linehan [14] define mindfulness as the regulation of attention (self-regulation of attention so that a person increases immediate acceptance of experiences and perceptions of all emotions and inner feelings in the present moment) and orientation of a person to experience (a person is led to curiosity, openness and acceptance to experiences in the present moment). Sexual mindfulness is one application of mindfulness that occurs during shared sexual experiences and can be described as moment-to-moment conscious attention and presence during a sexual relationship [15]. The trait of mindfulness is necessary but not sufficient for sexual mindfulness and requires higher mental skill and ability than other everyday activities [15, 16].

The Five Facets Mindfulness Questionnaire (FFMQ) [17] is widely used to measure mindfulness according to five dimensions: observing, describing, acting with awareness, nonjudging of inner experiences, and nonreacting to inner experiences. For mindfulness in the fields of family relationships, various questionnaires have been created, such as mindfulness in parenting (MIPQ) [17], mindfulness in romantic relationships (RMM) [18], mindfulness in couple relationships (MCRS) [19] and the sexual five-facet mindfulness questionnaire (FFMQ-S) [20]. The parenting mindfulness questionnaire focuses only on the relationship between mothers and children and does not consider other dimensions of family relationships; MIPQ and MCRS deal with mindfulness in the general and daily relationships of couples; Due to the great importance of sex in marital life and its stressful nature [8, 21], there was a need for a specific scale and a separate investigation from other variables of marital relations and the FFMQ-S deals exclusively with this field. The FFMQ-S was created to measure mindfulness during sexual experiences. This scale is the same dimensions of FFMQ [17] but in the field of sexual activity, i.e. *observing* (paying attention to sexual stimuli and gestures of the partner), *describing* (ability to describe and describe mental states during sex), *Acting with awareness* (performing sexual activities with the presence of mind and attention complete in the present moment, which is the opposite of automatic behavior and lack of attention), *Nonjudging of inner experience* (adopting a non-evaluative attitude towards thoughts and emotions of oneself and one's partner during sex) and *Nonreactivity to inner experience* (observing thoughts and emotions during sex without engaging in them).

A thorough evaluation of the psychometric properties of the FFMQ-S can help determine whether it is valid for use in women. The five factors of sexual mindfulness in women whose first language is Persian are currently not measured in the Persian language. Despite the fact that a major part of psychometric research has been conducted in other nations, it is important to evaluate the reliability and validity of this measure in Iranian culture. The purpose of this research is to evaluate the psychometric properties

psychological characteristics of the Persian version of the FFMQ-S with Iranian females, which was created and designed with the aim of examining mindfulness during sexual experiences. This study also considers the results of previous studies on the FFMQ-S scale of sexual mindfulness [19], the body image concerns Scale [21], and the sexual satisfaction Scale [22] to measure the validity of the Persian version of the FFMQ-S scale. Body image concerns include dissatisfaction and anxiety about appearance, lower sexual attractiveness, poorer health-oriented behaviors [23]. Due to the body's strong salience during sex, both visually and practically, Women who are somewhat unsatisfied with their bodies may become anxious during sexual relations, which affects both the quality of their own and their partner's sex [24]. Thus, We supposed that the score of the body image concerns Scale [21] would negatively correlate with the sexual mindfulness scale, and the score. We also supposed that the sexual satisfaction Scale [22] would positively correlate with the FFMQ-S among women.

## Method

### Recruitment and participants

The current research was conducted in order to validate the tool and implement it using descriptive correlation method. The statistical population included all Al-Zahra University students who were selected by multi-stage cluster sampling. For sampling, first a list of colleges was prepared and four colleges were selected based on that, and then six classes were randomly selected from among the selected colleges and the questionnaire link was sent to married students. Data collection lasted about five months from July to November in 2022.

In total, 674 married female students of Al-Zahra University completed the sexual mindfulness questionnaire. After removing outliers and indifferent data, the sample size was reduced to 668 women aged between 19 to 61 years ( $M = 30.69$ ,  $SD = 7.50$ ). See other demographic characteristics in the Table1.

Table 1  
participant demographics

variable		percent (n)
Years of marriage	less than one year	17.1% (n = 114)
	One to five years	46.1% (n = 308)
	Five to ten years	20.7% (n = 138)
	More than ten years	16.2% (n = 108)
Fields of study	humanities	44.6% (n = 298)
	Science	45% (n = 300)
	Technical Science	10% (n = 67)
	other	.4% (n = 3)
Participants' highest academic degree	Diploma-level	1.8% (n = 12)
	Associate degree	2.5% (n = 17)
	Bachelor's degree	40.4% (n = 270)
	Master's degree	44.5% (n = 297)
	Doctoral degree	10.8% (n = 72)
Partners' highest academic degree	Below a Diploma	1.2% (n = 8)
	Diploma-level	9.7% (n = 65)
	Associate degree	11.1% (n = 74)
	Bachelor's degree	38% (n = 254)
	Master's degree	31.1% (n = 208)
	Doctoral degree	8.8% (n = 59)
Number of children	no children	31.6% (n = 211)
	one child	51.2% (n = 342)
	two children	13.9% (n = 93)
	three or more children	3.3% (n = 22)

## Ethical considerations

After approving the subject and coordinating with the education department, ethical permission was obtained from the research department of Al-Zahra University, Tehran, in order to conduct sampling. The participants entered the research with personal consent and completed the questionnaire. During the

publication of the questionnaire, explanations were given to the participants regarding the subject of the research and it was stated that their information will be used only in the form of figures and statistics without including names

## Measures

Sexual Five Facets Mindfulness Questionnaire (FFMQ-S): This scale was created by Adam et al (21) in 19 items and 5 subscales. The factors of observing four items, describing four items, conscious action of four items, non-judgment of three items and non-reaction of three items include. This scale is designed with a five-point Likert ranging from never (1) to always (5). Items 2, 3, 6, 8, 9, 14, 16, 19 are reversed items. The original version of the FFMQ-S validated among 251 French-speaking women. The age range of the participants were from 18 to 67 years ( $M = 31.81$ ;  $SD = 11.60$ ). Participants completed the Mindfulness Questionnaire (FFMQ) [27] and the Female Sexual Distress Scale–Revised (FSDS-R) [28] for convergent and divergent validity. Cronbach's alpha was .88 for the whole questionnaire, which shows the good reliability of the structure. There was good reliability in all five factors: *Observation* (.80), *Describing* (.88); *Acting with awareness* (.87); *Nonjudging of inner experience* (.86); *Nonreactivity to inner experience* (.78). The results of the exploratory and confirmatory factor analysis of this questionnaire show that the construct validity is favorable (FFMQ-S) [21]. The Persian translation of the FFMQ-S measure was done using the Brislin (1986) method of translation. The FFMQ-S measure was translated as follows by two qualified translators who were fluent in both Persian and English. The FFMQ-S measure was originally translated from English into Persian by one translator. Unaware of the original translation request, the second translator was subsequently asked to translate the final Persian FFMQ-S measure from Persian into English. Finally, when three independent translators compared the Persian translation of the FFMQ-S measure to the original FFMQ-S measure, they found no appreciable variations in the substance or concept between the two translations. Thirty married students of Al-Zahra University were selected as a small sample of the target population and they were asked to answer the items of the translated version. After that, opinions were asked about the type of writing and the clarity of the items and the necessary changes were made and the final version was prepared for the implementation of the research.

Sexual Satisfaction Questionnaire (ISS) [23] : It is a tool with 25 items to evaluate the level of sexual satisfaction of couples. Items are answered on a five-point Likert scale ranging from never (1) to always (5). In total, the subjects' score fluctuates between 0 and 150 in the whole scale. A score below 50 is no sexual satisfaction, a score between 51 and 75 is low sexual satisfaction, a score between 76 and 100 is average sexual satisfaction, and a score between 101 and 125 is high sexual satisfaction. In the study of Larson (1998), acceptable internal consistency was obtained with Cronbach's alpha coefficient (.91). The Persian version of this scale was validated by [28], the alpha coefficient (.80) confirmed the reliability of the questionnaire and Convergent validity was confirmed with the Enrich Marital Satisfaction Questionnaire [29].

Body Image Concern Questionnaire: Littleton et al [21] This tool was made in nineteen items to measure people's attitude towards body image. It has two subscales: *Dissatisfaction with appearance* (11 items) and *interference in social functioning* (8 items). A five-point Likert scale is answered from never (1) to

always (5). In the research of Littleton et al [23] with Cronbach's alpha coefficient for all items, the first factor and the second factor were obtained respectively (.93), (.92) and (.72) and the reliability of the questionnaire was confirmed. Body dysmorphic disorder questionnaire (BDDE-SR) [27] was used for convergent validity. The Persian version of this scale was validated by [31], the alpha coefficient (.89) confirmed the reliability of the questionnaire and Convergent validity was confirmed with the Body Dysmorphic Disorder Modification questionnaire (YBOCS-BDD) [30].

## Results

### Content validity

In this research, the quantitative and qualitative content validity of the FFMQ-S was investigated. To check the qualitative content validity, the questions were sent to eight experts in the field of sexology and psychology and they were asked to express their views about the grammar, language use and expressions of the items, based on which, the translation of the items was accepted. Quantitative content validity is also measured by Content Validity Ratio and Content Validity Index (CVR, CVI) [28]. To check quantitative content validity, the same experts were asked to rate their opinion about the necessity of each item with a three-point Likert scale (*1 = not essential, 2 = useful but not essential, and 3 = essential*). CVR is calculated through relation 1: 
$$CVR = \frac{ne - N/2}{N/2}$$
.  $N$  is the number of experts and  $ne$  are the experts who recognized the desired item as necessary and gave it a score of 3. Having content validity, the value of CVR (with eight experts) for each item should be greater than .7 [29]. All indicators are higher than the desired value Table 1. The CVI index is used to examine the three characteristics of transparency, simplicity and relevance, which are scored with a four-point Likert scale (*1=not relevant at all, 2= somewhat relevant, 3= quite relevant, and 4= highly relevant*). The following relationship was used to evaluate the CVI for an item: The total number of experts who chose a score of 3 or 4 for each item divided by the total number of experts [31].

After calculating the CVI, if the CVI value for the item is less than .7, the item is unacceptable [32]. CVI values for all indicators are greater than .7 (with eight experts) and all indicators have acceptable content validity (see Table 2).



Table 2  
CVR and CVI of FFMQ-S items

No	Items	CVR	CVI		
		Essential (1–3)	Simplicity (1–4)	Relevancy (1–4)	Clarity (1–4)
1	I can easily identify when I'm sexually aroused.	.8	1	.8	.8
2	It's difficult for me to perceive physical sensations when my partner kisses me or caresses me.	.7	.7	.8	.7
3	I don't pay attention to my physiological change when I'm aroused (e.g., vaginal lubrication, heat).	.7	.7	.8	.8
4	I realize how the gestures of my partner impact on my emotions and my sexual arousal	.7	.7	.8	.7
5	I can easily help my partner to understand what makes me feel good or what my sexual needs are.	.8	.7	.8	.7
6	It's difficult to express to my partner what I feel during intercourse.	.8	1	.8	1
7	I easily feel my emotions during sexual intercourse.	.8	1	.8	1
8	I'm unable to say if I like or dislike a specific sexual activity.	.8	1	.8	1
9	I cannot reach orgasm because I'm quite often absent-minded.	.8	1	.8	1
10	I usually feel quite available and present during sexual intercourse.	.8	1	.8	.7
11	I have the feeling I have sex in an automatic way without being able to let go	1	1	.8	1
12	I have the feeling that all my sexual activities are consensual.	.8	1	.8	.7
13	I don't criticize myself when I have sexual fantasies that I consider to be "taboo."	.8	1	.8	.7
14	I think I should reach orgasm more quickly.	1	1	.8	1
15	I don't judge myself when I don't reach orgasm.	.8	1	.8	1

No	Items	CVR	CVI		
		Essential (1–3)	Simplicity (1–4)	Relevancy (1–4)	Clarity (1–4)
16	I think that some of my emotions are bad and I should not feel them.	.8	1	.8	1
17	When I don't experience enough satisfaction during sexual activities, I can take some distance and get perspective on that.	1	1	.8	.7
18	When I have negative thoughts, I feel them and let them go	.8	1	.8	.8
19	When I have negative emotions, I let them take over	1	1	.8	1

## Construct validity

### Preliminary Analysis

In this research, data entry steps were performed in SPSS26 and confirmatory factor analysis was performed in AMOS24 software. First, the status of the missing data was checked, and it was found that there is no lost data. In checking the normality of the data with Amos software, the skewness of the data was between  $\pm 2$  and the kurtosis was between  $\pm 5$ , which indicates that the data distribution is normal [33]. In Amos software, Mahalanobis index is used to detect outlier data. In this way, the largest numbers of the Mahalanobis scale should be divided by the number of items in the questionnaire and this ratio should not be more than 4. After reviewing the results, the cases in which this ratio was greater than 4 were removed from the data, and after removing outliers, the sample size was reduced to 668 people [33].

## Confirmatory factor analysis

In order to determine the validity of the FFMQ-S and confirm the five-factor structure of the questionnaire, confirmatory factor analysis was performed in AMOS24 software. The sample size required for confirmatory factor analysis is considered to be 5 to 20 times greater than the total number of scale items [34]. Considering that this scale had 19 items, the sample was estimated to be 21 times the number of items, i.e., 399 people, and considering the possibility of drop and the nature of the research, the sample was increased to 668 people. The first step was to check the factor loadings of each item, which should not be negative, more than 1 or less than .4, otherwise, the desired item will be removed from the analysis (40). The obtained results show that the factor loadings in all the items have the stated conditions, therefore no item was deleted and the results of the confirmatory factor analysis showed that the five factors of the FFMQ-S (*observing, describing, acting with awareness, Nonjudging of inner experience and Nonreactivity to inner experience*) was confirmed in experiments (see Fig. 1). The five factors have a positive correlation of less than .9 ( $p > .001$ ), which indicates that according to the theoretical basis, the five factors of sexual mindfulness evaluate the same structure, and at the same

time, they are five separate factors from each other. As seen in Fig. 1, the highest correlation was observed between the factors of *describing* and *acting with awareness* (.84), and the lowest correlation was observed between the factors of *observing* and *Nonreactivity to inner experience* (.56). In Table 3, the mean and standard deviation of sexual mindfulness items are presented.

Table 3  
Mean and standard deviation of the factors and items of the FFMQ-S

No	Items	Mean	standard deviation
1	I can easily identify when I'm sexually aroused.	4.57	.71
2	It's difficult for me to perceive physical sensations when my partner kisses me or caresses me.	4.27	.87
3	I don't pay attention to my physiological change when I'm aroused (e.g., vaginal lubrication, heat).	3.95	.96
4	I realize how the gestures of my partner impact on my emotions and my sexual arousal	4.47	.85
5	I can easily help my partner to understand what makes me feel good or what my sexual needs are.	4.29	.96
6	It's difficult to express to my partner what I feel during intercourse.	4.05	1.04
7	I easily feel my emotions during sexual intercourse.	4.46	.82
8	I'm unable to say if I like or dislike a specific sexual activity.	4.09	1.12
9	I cannot reach orgasm because I'm quite often absent-minded.	4.50	.85
10	I usually feel quite available and present during sexual intercourse.	4.56	.67
11	I have the feeling I have sex in an automatic way without being able to let go	4.45	.86
12	I have the feeling that all my sexual activities are consensual.	4.27	.94
13	I don't criticize myself when I have sexual fantasies that I consider to be "taboo."	3.77	1.45
14	I think I should reach orgasm more quickly.	4.39	1.01
15	I don't judge myself when I don't reach orgasm.	3.87	1.50
16	I think that some of my emotions are bad and I should not feel them.	4.50	.89
17	When I don't experience enough satisfaction during sexual activities, I can take some distance and get perspective on that.	4.11	1.19
18	When I have negative thoughts, I feel them and let them go	4.07	1.12
19	When I have negative emotions, I let them take over	4.29	1

The second step, the fit indicators were checked. The acceptable criterion of normalized chi-square (CMIN/DF) is less than 5, root mean square error of estimate RMSEA less than .08 and comparative fit index CFI, goodness of fit index GFI, incremental fit index IFI should all be greater than .90 (41). The results obtained after the corrections indicate that the fit has been accepted in measuring the factors of the sexual mindfulness scale (See Table 4).

Table 4  
Model fit indices

Indicates	CMIN/DF	RMSEA	IFI	CFI	GFI
Value	4.62	.07	.90	.90	.90

In the last step, construct reliability and Cronbach's alpha coefficient were examined. Construct reliability and Cronbach's alpha coefficient were used to examine the internal consistency and reliability of five sexual mindfulness factors; Thus, the construct reliability and Cronbach's alpha coefficient is greater than .7, meaning the internal consistency and reliability of the variables [37]. The results indicate acceptable construct reliability and internal consistency (see Table 5).

## Concurrent Validity

Based on the results reported in Table 6, in the concurrent validity analysis, a significant positive correlation was found between the five factors of the sexual mindfulness and sexual satisfaction, and in addition, there was a significant negative correlation between the five factors of the sexual mindfulness and body image concern.

## Discussion

This research was conducted with the aim of investigating the psychometric properties of the FFMQ-S among Iranian women. After the translation of the scale by experts, quantitative and qualitative content validity was then checked. The results showed that the FFMQ-S has a good content validity index and content validity ratio according to experts. Also, the results indicated acceptable face validity from the participants' point of view. According to the theoretical framework of Adam et al [19] research, the structural validity of the present study showed that the five dimensions of *observing, describing, Acting with awareness, Nonjudging of inner experience* and *Nonreactivity to inner experience* of sexual mindfulness scale have a confirmed factor structure. In this way, the factor loadings of all items were more than .4 and the model had a good fit. As a result, it can be said that all dimensions and items remained in the scale of sexual mindfulness. Also, the coefficients of Cronbach's alpha and internal consistency indicated the reliability and validity of the scale. The results are in line with the research of Adam et al [19] and therefore the FFMQ-S can be used among Iranian women.

According to research hypotheses, the results of Pearson's correlation analysis showed that sexual mindfulness and the factors of *observing* (paying attention to the stimuli and sexual gestures of the partner), *describing* (ability to describe and describe mental states during sex), *acting with awareness*

(performing sexual activities with presence of mind and full attention in the present moment, which is the opposite of habitual behavior and inattention), *non-judgment of inner experiences* (adopting a non-evaluative attitude towards thoughts and emotions of oneself and one's partner during sex) and *non-reaction to inner experiences* (observation of thoughts and emotions during sex without engaging in them) has a positive and significant relationship with sexual satisfaction, and as a result, this scale has good convergent validity.

This finding is consistent with researches that show that sexual mindfulness has a positive relationship with sexual satisfaction [8–30, 31]. Sexual satisfaction is defined as a feeling of mutual pleasure from sexual intercourse. In explaining this relationship, it can be said that women usually pay more attention to the satisfaction of their sexual partners in sexual relationships, and with sexual mindfulness, they learn to consciously focus on their sexual pleasure and stimulation, which increases their sexual satisfaction [32]. In addition, one of the causes of female sexual disorder and, consequently, a decrease in sexual satisfaction in women is disturbing and distracting thoughts during intimate sexual relations [33]. With sexual mindfulness notices feelings and details related to sexual interactions and by providing feedback to the sexual partner, they increase the sexual harmony and intimacy of themselves and their partner [15]. Leonhart et al [34] and Dawson et al [42] found similar results that improved sexual mindfulness skills lead to sexual well-being. Among its reasons, it can be said that the use of conscious action and non-judgment in the sexual field may help spouses to avoid common conflicts and misunderstandings in sexual relations [8]. By not judging sexual experiences, women can avoid negative evaluation of their sexual performance, which is another cause of sexual problems [33].

Also, the correlation results showed that sexual mindfulness and its five factors have a significant negative correlation with body image concern [21]. Sexual mindfulness causes conscious acceptance and non-judgment of oneself during sex and reduces sexual anxiety, while women who are worried about body image experience little comfort during sex, and regarding the acceptance and sexual gaze of their spouse and desire They show a lot of self-doubt about their sexuality [34, 35]. In order to change habits towards health-oriented behavior, people with body image concerns must first learn to observe and describe their behaviors consciously [36]. Women who are more satisfied with their appearance and body image experience greater satisfaction, comfort, and sexual desire and more orgasms in sex [37, 38]. Much researches have focused on the relationship between body image and women's sexual performance, perhaps because women are more concerned with their body image and during sex thoughts such as how their physical appearance looks, it seems to distract them [37]. Concerns about body image reduces sexual performance and sexual satisfaction [39]. Research shows that sexual mindfulness is related to sexual self-esteem, marital satisfaction, marital conflict resolution, sexual harmony, and relational well-being [8, 15], and on the other hand, body image concerns are associated with anxiety and sexual problems, the reduction of sexual self-esteem is related to psychological problems such as paranoia, anxiety and depression [25, 44, 45]. A negative image towards the body causes mental concern in this field and increases self-criticism and decreases sexual desire, which causes a decrease in the quality of sex and marital relationship. By increasing sexual self-esteem, sexual mindfulness teaches women to openly and consciously share their sexual issues and desires with their sexual partners [8].

This research had some limitations. Firstly, research sample was selected from among the students, and there is a need to spread the example to other members of the society. Secondly, the diversity of culture in Iranian society requires the need to measure the validity of this tool in different cultures in future research. Thirdly, this research did not represent the attitude of the whole society, so there is a need to use a larger sample size in future research. Fourth, this study solely used self-report data, which has the risk of bias because it depends on individuals' willingness to answer questions honestly as well as their own level of understanding into their attitudes. Finally, the 2-wave longitudinal design and correlational nature of the current study prevented us from evaluating potential causal relationships.

## **Suggestions**

Considering that the psychometric properties of the Persian version of the FFMQ-S were confirmed, this scale can be used in clinical and research studies. Noticing that the effectiveness of mindfulness on women's sexual difficulties has been confirmed in research, the scale of sexual mindfulness can be used for more accurate measurement and better training in this field. In addition to providing a general score of sexual mindfulness, the scale of sexual mindfulness provides the score of five factors of sexual mindfulness separately, which provides the possibility of more targeted interventions for psychologists and counselors. For example, if women with sexual dysfunction report higher levels of judging experiences, intervention may focus more on acceptance of experiences. Since the quality of sexual relationship can include wide individual and family dimensions, it is suggested that the effect of sexual mindfulness on emotion regulation and interpersonal relationships be investigated in future researches.

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### **Conflict of interest**

The authors have no conflicts of interest to declare relevant to this article's content.

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### **Contributions**

All authors contributed to the study conception and design equal.

## **References**

1. Parish SJ, Cottler-Casanova S, Clayton AH, McCabe MP, Coleman E, Reed GM. The Evolution of the Female Sexual Disorder/Dysfunction Definitions, Nomenclature, and Classifications: A Review of DSM, ICSM, ISSWSH, and ICD. *Sex Med Rev* [Internet]. 2021;9(1):36–56. Available from: <https://doi.org/10.1016/j.sxmr.2020.05.001>
2. Manjula V, Munivenkatappa M, Navaneetham J, Philip M. Quality of Marital Relationship and Sexual Interaction in Couples With Sexual Dysfunction: An Exploratory Study From India. 2021;
3. Adam F, De Sutter P, Day J, Grimm E. A Randomized Study Comparing Video-Based Mindfulness-Based Cognitive Therapy With Video-Based Traditional Cognitive Behavioral Therapy in a Sample of Women Struggling to Achieve Orgasm. *J Sex Med* [Internet]. 2020;17(2):312–24. Available from: <https://doi.org/10.1016/j.jsxm.2019.10.022>
4. Tavares IM, Moura C V., Nobre PJ. The Role of Cognitive Processing Factors in Sexual Function and Dysfunction in Women and Men: A Systematic Review. *Sex Med Rev*. 2020;8(3):403–30.
5. McCabe MP. Journal of Sex & Marital Evaluation of a Cognitive Behavior Therapy Program for People with Sexual Dysfunction. 2011;(October 2014):37–41.
6. Khaddouma A, Coop Gordon K, Strand EB. Mindful Mates: A Pilot Study of the Relational Effects of Mindfulness-Based Stress Reduction on Participants and Their Partners. *Fam Process*. 2017;56(3):636–51.
7. Karremans JC, Schellekens MPJ, Kappen G. Bridging the Sciences of Mindfulness and Romantic Relationships: A Theoretical Model and Research Agenda. *Personal Soc Psychol Rev*. 2017;21(1):29–49.
8. Leavitt CE, Lefkowitz ES, Waterman EA. The role of sexual mindfulness in sexual wellbeing, Relational wellbeing, and self-esteem. *J Sex Marital Ther*. 2019;45(6):497–509.
9. Brotto LA, Chivers ML, Millman RD, Albert A. Mindfulness-Based Sex Therapy Improves Genital-Subjective Arousal Concordance in Women With Sexual Desire/Arousal Difficulties. *Arch Sex Behav*. 2016;45(8):1907–21.
10. Brotto LA, Basson R, Smith KB, Driscoll M, Sadownik L. Mindfulness-based Group Therapy for Women with Provoked Vestibulodynia. *Mindfulness (N Y)*. 2015;6(3):417–32.
11. Banbury S, Lusher J, Snuggs S, Chandler C. Mindfulness-based therapies for men and women with sexual dysfunction: a systematic review and meta-analysis. *Sex Relatsh Ther* [Internet]. 2021;0(0):1–22. Available from: <https://doi.org/10.1080/14681994.2021.1883578>
12. Kabat-Zinn J. Mindfulness-based interventions in context: Past, present, and future. *Clin Psychol Sci Pract*. 2003;10(2):144–56.
13. Bishop SR, Lau M, Shapiro S, Carlson L, Anderson ND, Carmody J, et al. Mindfulness: A proposed operational definition. *Clin Psychol Sci Pract*. 2004;11(3):230–41.
14. Dimidjian S, Linehan MM. Defining an agenda for future research on the clinical application of mindfulness practice. *Clin Psychol Sci Pract*. 2003;10(2):166–71.
15. Leavitt CE, Maurer TF, Clyde TL, Clarke RW, Busby DM, Yorgason JB, et al. Linking Sexual Mindfulness to Mixed-Sex Couples' Relational Flourishing, Sexual Harmony, and Orgasm. *Arch Sex*



Behav. 2021 Aug 1;50(6):2589–602.

16. Leavitt CE, Whiting JB, Hawkins AJ. The Sexual Mindfulness Project: An Initial Presentation of the Sexual and Relational Associations of Sexual Mindfulness The Sexual Mindfulness Project : An Initial Presentation of the Sexual and Relational Associations of Sexual. *J Couple Relatsh Ther* [Internet]. 2020;0(0):1–17. Available from: <https://doi.org/10.1080/15332691.2020.1757547>
17. Heeren A, Douilliez C, Peschard V, Debrauwere L, Philippot P. Cross-cultural validity of the Five Facets Mindfulness Questionnaire: Adaptation and validation in a French-speaking sample Validité transculturelle du Five Facets Mindfulness Questionnaire : adaptation et validation auprès d ' un échantillon francophone. *Rev Eur Psychol Appl* [Internet]. 2011;61(3):147–51. Available from: <http://dx.doi.org/10.1016/j.erap.2011.02.001>
18. McCaffrey S, Reitman D, Black R. Mindfulness In Parenting Questionnaire (MIPQ): Development and Validation of a Measure of Mindful Parenting. *Mindfulness (N Y)* [Internet]. 2017;8(1):232–46. Available from: <http://dx.doi.org/10.1007/s12671-016-0596-7>
19. Kimmes JG, Jaurequi ME, May RW, Srivastava S, Fincham FD. Mindfulness in the Context of Romantic Relationships: Initial Development and Validation of the Relationship Mindfulness Measure. *J Marital Fam Ther*. 2018;44(4):575–89.
20. McGill J, Adler F, Leah B. The Mindfulness in Couple Relationships Scale: Development and Validation. *Mindfulness (N Y)* [Internet]. 2022;2299–314. Available from: <https://doi.org/10.1007/s12671-022-01957-w>
21. Adam F, Heeren A, Day J, De Sutter P. Development of the sexual five-facet mindfulness questionnaire (FFMQ-S): Validation among a community sample of French-speaking women. *J Sex Res*. 2015;52(6):617–26.
22. Leavitt CE, Allsop DB, Busby DM, Driggs SM, Johnson HM, Saxey MT. Associations of mindfulness with adolescent outcomes and sexuality. *J Adolesc*. 2020;81:73–86.
23. Littleton HL, Axsom D, Pury CLS. Development of the body image concern inventory. *Behav Res Ther*. 2005;43(2):229–41.
24. Larson JH, Anderson SM, Holman TB, Niemann BK. A longitudinal study of the effects of premarital communication, relationship stability, and self-esteem on sexual satisfaction in the first year of marriage. (November 2014):37–41.
25. Becker CB, Verzijl CL, Kilpela LS, Wilfred SA, Stewart T. Body image in adult women: Associations with health behaviors, quality of life, and functional impairment. 2019;
26. Bowsfield ML, Cobb RJ. Sexual Anxiety Mediates Dyadic Associations Between Body Satisfaction and Sexual Anxiety Mediates Dyadic Associations Between Body Satisfaction and Sexual Quality in Mixed – Sex Couples. 2021;(October 2022).
27. Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment*. 2006;13(1):27–45.
28. Derogatis LR, Rosen R, Leiblum S, Burnett A, Heiman J. The Female Sexual Distress Scale (FSDS): Initial validation of a standardized scale for assessment of sexually related personal distress in

- women. *J Sex Marital Ther.* 2002;28(4):317–30.
29. Bahrami N, Yaghoob Zadeh A, Sharif Nia H, Soliemani MA, Haghdoost AA. Validity and reliability of the persian version of Larson sexual satisfaction questionnaire in couples. *J Kerman Univ Med Sci.* 2016;0(0):1–22.
  30. Olson DH, Fournier DG, Druckman JM. Counselor's manual for PREPARE/ENRICH. (Revised e. Minneapolis, MN, PREPARE/ENRICH, Inc. 1987.
  31. Rosen JC, Reiter J. Development of the body dysmorphic disorder examination. *Behav Res Ther.* 1996;34(9):755–66.
  32. Fekart F. the relationship between body image and self-esteem with marital adjustment in female employees of Kerman University of Medical Sciences. Islamic Azad University, Islam branch; 2013.
  33. Phillips KA. Body dysmorphic disorder modification of the YBOCS. McLean Ver. Belmont, MA: McLean Hospital; 1993.
  34. Cook DA, Beckman TJ. Current concepts in validity and reliability for psychometric instruments: Theory and application. *Am J Med.* 2006;119(2):166.e7-166.e16.
  35. LAWSHE CH. a Quantitative Approach To Content Validity. *Pers Psychol.* 1975;28(4):563–75.
  36. Lynn SJAY, Das LS, Michael N, Williams JC. *International Journal of Clinical Mindfulness, Acceptance, and Hypnosis : Cognitive and Clinical Perspectives.* (April 2015):37–41.
  37. Polit DF, Beck T, Owen S V. Focus on Research Methods Is the CVI an Acceptable Indicator of Content Validity ? *Appraisal and Recommendations.* 2007;459–67.
  38. Tabachnick BG, Fidell LS. *Using multivariate statistics.* 6th ed. Pearson Education. Boston: Pearson Education; 2013.
  39. Kellar PS, Kelvin EA. *Munro's statistical methods for health care research.* 6th ed. Wolters Kluwer Health/Lippincott Williams & Wilkins; 2013.
  40. Kline RB. Response to Leslie Hayduk's review of *Principles and Practice of Structural Equation Modeling.* 4th ed. Vol. 4. New York: Guilford Press; 2018. 188–195 p.
  41. Byrne BM. *Structural equation modeling with AMOS: Basic concepts, applications, and programming* [Internet]. routledge; 2016. Available from: <https://www.ptonline.com/articles/how-to-get-better-mfi-results>
  42. Lafortune D, Girard M, Bolduc R, Boislard MA, Godbout N. Insecure Attachment and Sexual Satisfaction: A Path Analysis Model Integrating Sexual Mindfulness, Sexual Anxiety, and Sexual Self-Esteem. *J Sex Marital Ther* [Internet]. 2022;48(6):535–51. Available from: <https://doi.org/10.1080/0092623X.2021.2011808>
  43. Leavitt CE, Whiting JB, Hawkins AJ. The Sexual Mindfulness Project: An Initial Presentation of the Sexual and Relational Associations of Sexual Mindfulness. *J Couple Relatsh Ther.* 2021;20(1):32–49.
  44. Laura CS, Rodr V, Garc M, Petisco-rodr C. Mindfulness in Sexual Activity, Sexual Satisfaction and Erotic Fantasies in a Non-Clinical Sample. 2021;

45. Stephenson KR, Kerth J. Effects of Mindfulness-Based Therapies for Female Sexual Dysfunction: A Meta-Analytic Review. *J Sex Res* [Internet]. 2017;54(7):832–49. Available from: <https://doi.org/10.1080/00224499.2017.1331199>
46. Leonhardt ND, Clarke RW, Leavitt CE, Leonhardt ND, Clarke RW, Leavitt CE. Religiosity, Sexual Satisfaction, and Relationship Satisfaction : The Moderating Role of Sexual Mindfulness and Sexual Sanctification Religiosity, Sexual Satisfaction, and Relationship Satisfaction : *J Sex Marital Ther* [Internet]. 2023;49(2):155–71. Available from: <https://doi.org/10.1080/0092623X.2022.2080132>
47. Dawson SJ, Jang GE, Goldberg SY. A Brief Psychoeducational Sexual Mindfulness Intervention to Bolster Sexual Well-Being. *Mindfulness*. *Mindfulness* (N Y). 2022;7(13):2827–44.
48. Meltzer AL, McNulty JK. Role of Sexual Frequency and Sexual Satisfaction. *J Fam Psychol*. 2010;24(2):156–64.
49. Fallbjörk U, Rasmussen BH, Karlsson S, Salander P. Aspects of body image after mastectomy due to breast cancer - A two-year follow-up study. *Eur J Oncol Nurs* [Internet]. 2013;17(3):340–5. Available from: <http://dx.doi.org/10.1016/j.ejon.2012.09.002>
50. Sala M, Rochefort C, Lui PP, Baldwin AS. Trait mindfulness and health behaviours: a meta-analysis. *Health Psychol Rev* [Internet]. 2020;14(3):345–93. Available from: <https://doi.org/10.1080/17437199.2019.1650290>
51. Dosch A, Rochat L, Ghisletta P. Psychological Factors Involved in Sexual Desire, Sexual Activity, and Sexual Satisfaction : A Multi-factorial Perspective. *Arch Sex Behav* [Internet]. 2016;2029–45. Available from: <http://dx.doi.org/10.1007/s10508-014-0467-z>
52. van den Brink F, Smeets MAM, Hessen DJ, Woertman L. Positive Body Image and Sexual Functioning in Dutch Female University Students: The Role of Adult Romantic Attachment. *Arch Sex Behav* [Internet]. 2016;45(5):1217–26. Available from: <http://dx.doi.org/10.1007/s10508-015-0511-7>
53. Satinsky S, Reece M, Dennis B, Sanders S, Bardzell S. An assessment of body appreciation and its relationship to sexual function in women. *Body Image*. 2012;9(1):137–44.
54. Gillen MM, Markey CH. A review of research linking body image and sexual well-being. *Body Image* [Internet]. 2019;31:294–301. Available from: <https://doi.org/10.1016/j.bodyim.2018.12.004>
55. Satyko G, Barbosa V, Palma I, Libardi C, Furtado M, Kodato S, et al. Journal of Affective Disorders Body image and its relationships with sexual functioning, anxiety, and depression in women with polycystic ovary syndrome. *J Affect Disord* [Internet]. 2019;253(November 2018):385–93. Available from: <https://doi.org/10.1016/j.jad.2019.05.006>

## Tables

Tables 5 & 6 are not available with this version.

## Figures

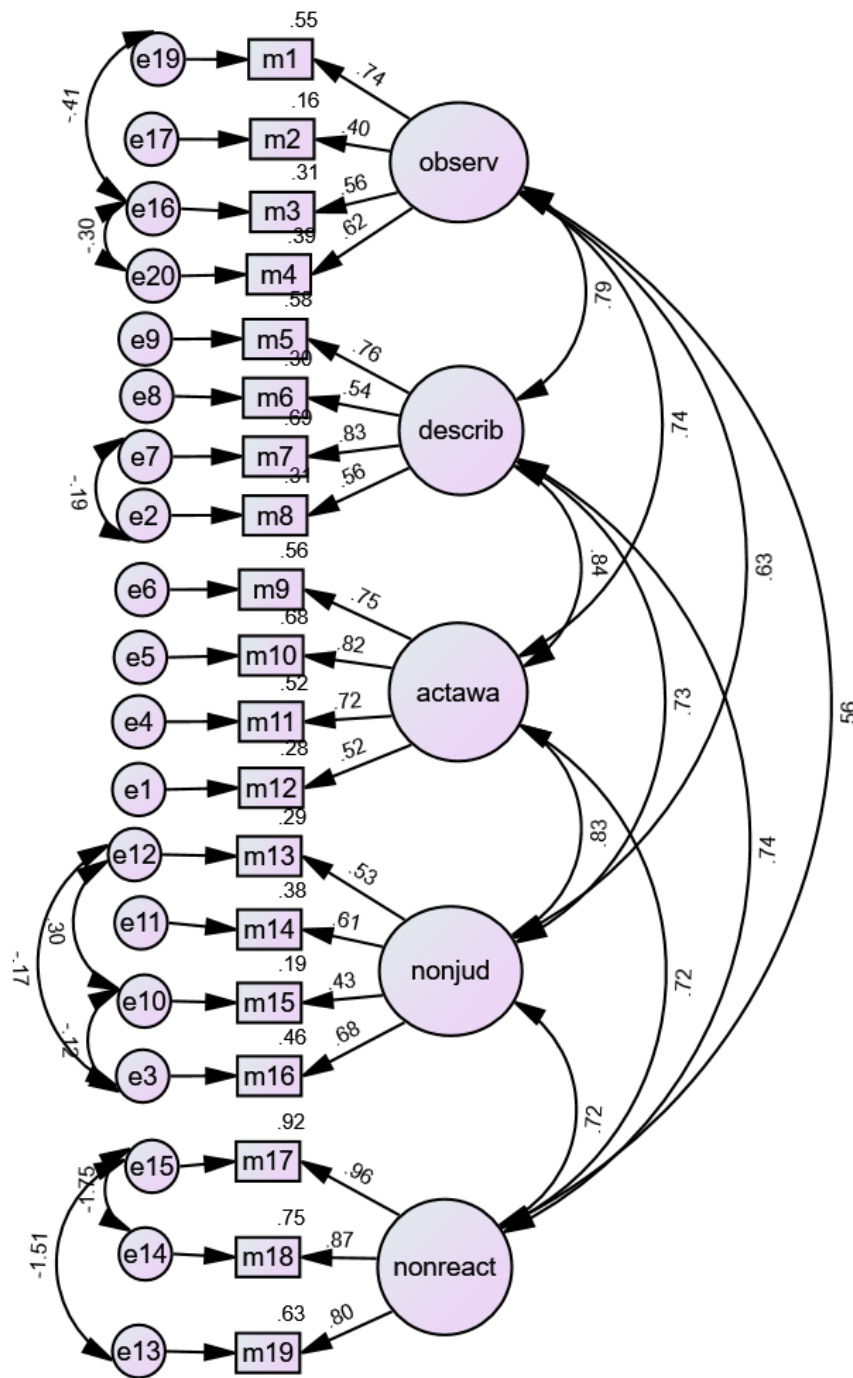


Figure 1

Confirmatory factor analysis with factor loadings for the five sub scales of Sexual mindfulness scale ( $p < .001$ )