

## Psychometric properties of Dyadic Sexual Communication Scale- Persian version

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### Abstract

**Background and Aim:** Couples' sexual communication is one of contributing factors to the quality of couples' sexual relationships. The aim of the present study was to psychometrically evaluate the Persian version of the Dyadic Sexual Communication Scale (DSCS) among married women of reproductive age.

**Methods:** In this psychometric study, translation was carried out using the back-translation method. The validity of the final version of the DSCS was performed using confirmatory factor analysis and Rasch analysis. Concurrent validity was examined using the Female Sexual Function Index (FSFI), Female Sexual Distress Scale (FSDS) and Marital Intimacy Scale (MIS). Reliability was assessed by calculating Cronbach's alpha coefficient. Data analysis was performed using SPSS and Mplus software.

**Results:** The participants comprised 400 married women with a mean age of 35.66 years living in Qazvin, Iran. Construct validity was confirmed based on confirmatory factor analysis ( $\chi^2$ [df]: 113.49 [65], Tucker-Lewis index: 0.980, Composite Reliability: 0.87, SRMSR: 0.065, RMSEA: 0.043, CFI: 0.983. Concurrent validity was analyzed using Pearson correlation coefficients and the DSCS was positively correlated with scores on the MIS ( $r=.64$ ) and FSFI ( $r=.65$ ), and negatively

correlated with scores on the FSDS ( $r=-.61$ ). The internal reliability of the Persian DSCS was very good (Cronbach's  $\alpha=.88$ ).

**Conclusion:** Based on psychometric testing, the Persian DSCS has good validity and reliability. Therefore, the tool can be used to assess women's sexual communication in the context of sexual relationships. Future research should include males and compare and contrast results with females.

**Keywords:** Dyadic sexual communication, sexual relationships, psychometrics, Persian Dyadic Sexual Communication Scale

## **Introduction**

Family is a basic important social institution. If it functions properly, its members will enjoy good health and well-being (1). The quality of marital life and marital satisfaction has a positive and direct relationship with sexual satisfaction. Marital satisfaction is also an important aspect in protecting the family foundation. This construct is one of the variables that has been widely studied in family and marriage research and is considered as an underlying construct in both relationship studies and family therapy studies (2). Marital satisfaction is a general assessment of the marital status or the present romantic relationship of the individual. It can also be a reflection of the level of happiness and the favorable feeling of couples about their marital relationship or a combination of happiness by many factors specific to the marital relationship (3). Marital satisfaction has been defined as a mental experience of happiness within marital relationships (4). Marital satisfaction is a state of mind that reflects the perceived benefits and values of marriage with an individual (5). Therefore, marital satisfaction is a vital element for continuing to live together.

One of the general key factors in assessing the quality of life among married individuals is the quality and continuity of marital relationship and particularly sexual satisfaction (6). This is closely related to the constructs of marital quality such as marital relationships (7) and marital satisfaction (8). Consequently, this construct has been studied as one of the factors of marital instability and predicting the possibility of future divorce (9).

A sexual partner's relationship is an often discussed contributing factor to sexual satisfaction (10). Sexual satisfaction and sexual distress are directly related to five factors comprising affection, communication, adjustment and personal concerns (11). Sexual activity is not merely influenced by biological needs and reproductive instinct. Sex is a means of communication and a way to express various emotions such as intimacy, love, anger, and

aggression (12). (13) asserts that hostility, anger, distrust, distress, and difficulty expressing sexual needs are negative factors interfering with sexual relationships.

The results of a survey among 996 Canadians showed that sexual well-being was the best predictor of sexual satisfaction for almost all participants (14). Effective communication between sexual partners can help increase stimulation and orgasm by facilitating sexual intercourse, intimacy, and sexual satisfaction through participation about sexuality and preferences. In fact, feelings of inability to communicate with libido are a common feature of orgasm problems, and sexually daring women report higher levels of desire, orgasmic ability, and sexual satisfaction (15). The quality of marital relationships along with the skill of establishing a good relationship and effective communication play an important role in improving the quality of marital life (16, 17). The dominant initiator of sexual activity among heterosexual couples are men rather than women. When both partners contribute in sexual activity initiation, they experience higher satisfaction level (18). The ability of partners in expression of sexual desires, sexual concerns, sexual preferences and sexual expectation with each other is important aspect to reach higher satisfaction in sexual relations (19). Despite the association of ability to initiate sexual activity and communicate about sexual related issues with sexual satisfaction, in many cultures sex remains a taboo subject and expression of sexual concerns and expectations is socially suppressed particularly for women globally (20) and in Iran which is a traditional religious community (21-23). Internalized cultural related gender stereotypes is a barrier for sexual communication (20) and can negatively associated with women's assertiveness to express her feelings to her partner regarding her sexual expectation and concerns (24).

In positive marital relationships, couples have good communication skills. These skills include behaviors that contribute to the durability of marriage. The existence of communication skills among couples is characterized with equality, communication growth, closeness and dependency, conflict and tension resolution, and commitment and confidence in each other (25).

Given that communication involves the way information is exchanged and can be direct or indirect, open or hidden, the healthiest type of communication is clear and direct communication, and in healthy families, the messages sent are clear and received correctly (26).

### ***Psychometric testing***

To assess sexual communication, various psychometric scales have been developed. There are two basic approaches to assessing the psychometric properties of a tool: classical test theory (CTT) (27) or item response theory (IRT) (28). According to CTT theory, test scores include the observed score, true score, and error score (27). Therefore, simple linear models are constructed that relate the observation score to the sum of the scores of the two invisible variable scores, the true score and the error score. However, in models based on CTT theory, the emphasis is mainly on the overall test score. That is, instead of relating the scores of each question to the actual score, it relates the total score of the test to the true score. Therefore, statistical indicators such as the difficulty and discrimination power of the item and the relationship that these indicators find in the process of making the test with the mean, standard deviation and reliability are used. However, the observed score and the true score of the participants are not synonymous with the score of their abilities. This issue has been addressed by the IRT approach (29). One of the approaches to IRT is Rasch model, which puts the unchanging parameters of the questions (difficulty, discrimination) directly on the individual analysis of the question and therefore does not require assumptions that the distribution is normal (30).

The Rasch model is a latent trait model that converts ordinal data into interval data that are suitable for parametric statistical methods. If the data fit the model, the Rasch model provides a linear scale for assessing the desired attribute. Rasch analysis is a convenient technique for testing construct validity and improving the quality and ability of a tool to distinguish between different levels of latent trait (30).

## ***Psychometric scales and sexual communication***

Valid and reliable Persian versions of scales assessing marital related issues have generally focused on the whole relationship not specifically sexual communication. Couple's sexual communication is about transferring information, as well as feelings and needs about sexual intercourse between a couple. To best of the authors' knowledge, despite there being an existing Persian version of the Dyadic Sexual Communication Scale (DSCS) no previous study has ever investigated the psychometric properties of the DSCS using Rasch analysis. Therefore, the present study assessed the construct validity of the DSCS using confirmatory factor analysis (CFA) and Rasch analysis. Moreover, the differential function of the DSCS was examined across participants' age, spouse's age, sexual function, and sexual distress groups.

## **Methods**

### ***Study design and participants***

The present study was conducted between January and May 2020 in Qazvin, Iran. The participants were 400 married women of reproductive age who referred to Qazvin urban comprehensive health centers for reception of various services (e.g., family planning, preconception counseling, child growth and development services). The exclusion criteria comprised pregnancy, lactation, experiencing stressful events in the past three months, having physical and/or psychological diseases, and taking psychiatric drugs (based on self-report).

### ***Sampling***

To access participants with maximum variation in terms of economic, social, and cultural status, two-stage cluster sampling was performed. In the first stage, Qazvin city was divided into five geographical districts. Then, in each of the five districts of Qazvin, one health center was

randomly selected. Then, in selected health centers, eligible individuals were invited to participate in the study.

### ***Measures***

*Dyadic Sexual Communication Scale* (DSC; Catania et al., 1998): The 13-item DSCS was used to assess sexual communication between couples. Items (e.g., “*My partner rarely responds when I want to talk about our sex life*”) are rated on a six-point scale from 1 (completely disagree) to 6 (completely agree). The scores range from 13 to 78 and higher scores indicate more effective dyadic sexual communication. The Cronbach’s alpha in the original version showed very good internal consistency (.91). Psychometric properties of the Dutch version were assessed and confirmed by Pazmany et al. (2015). The psychometric properties of the Persian version of the DSCS have been found to be acceptable based on exploratory and confirmatory factor analysis and Cronbach’s alpha of 0.814. (32). Cronbach’s alpha in the present study was 0.876.

*Revised Female Sexual Distress Scale* (FSDS-R; (33)). The 13-item FSDS-R was used to assess female sexual distress. Items (e.g. Distressed about your sex life) are rated on a five-point scale from 0 (*never*) to 4 (*always*). The scores range from 0 to 52 and higher scores indicate more sexual distress. The FSDS-R has been found to have very good reliability ( $\alpha=.87-.93$ ) and intra-class correlation coefficient of .74-.86 (34). A cutoff score of  $\geq 11$  has been reported to discriminate between women reporting sexual distress (33). The psychometric properties of Persian version was assessed and confirmed (35). Cronbach’s alpha in the present study was 0.946.

*Marital Intimacy Scale* (MIS; Walker & Thompson, 1983): The 17-item MIS was used to assess love and intimacy. Items (e.g. We want to spend our time together) are rated on a seven-point scale from 1 (*never*) to 7 (*always*). The scores range from 17 to 119 and higher scores indicate

greater intimacy. The MIS has been found to have excellent reliability ( $\alpha=.91-0.97$ ; (36). Cronbach's alpha in the present study was 0.97.

*Female Sexual Function Scale (FSFI; Rosen et al., 2000)*: The 19-item FSFI was used to assess female sexual function. The scale comprises six subscales (i.e., desire, arousal, lubrication, orgasm, satisfaction, and sexual pain). The FSFI has been used in many studies and has shown a high degree of internal consistency and reliability (37). The psychometric properties of the Iranian version of the FSFI were tested by Fakhri et al. (2012) and reported good psychometric properties. A cutoff score of  $\geq 24.75$  had shown to distinguish between women with sexual dysfunction (38). Cronbach's alpha in the present study was 0.95.

In addition, the survey included questions concerning demographic information including age, education level, occupation of participants and their husbands, perceived economic status of family, perceived life satisfaction, and duration of their marital relationship.

### ***Statistical analysis***

Statistical analyses were performed comprising both CTT and IRT approaches using SPSS version 25, the lavaan package in R software (39), and Winsteps version 3.72.3. The unidimensionality of the DSCS was examined by performing CFA and a principal component analysis of the residuals (PCAR) in the Rasch analysis. The CFA was conducted with the diagonally weighted least square (DWLS) estimator (40). To assess model fit, the following indices were used: chi-square ( $\chi^2$ ) and its degrees of freedom (DF), comparative fit index (CFI) and Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). An acceptable fitting model has a non-significant  $\chi^2$ , CFI and TLI  $>0.90$ , and RMSEA and SRMR  $<0.08$ . Average variance extracted (AVE) and composite reliability (CR) were then calculated based on the CFA results to verify convergent validity of the



DSCS. Values above 0.5 and 0.6 were considered as acceptable threshold values for AVE and Cr, respectively.

To further examine construct validity of the DSCS, Rasch partial-credit analysis was applied to the data. Item fit was tested using information-weighted fit statistic (infit) mean square (MnSq) and outlier-sensitive fit statistic (outfit) MnSq with values between the 0.5–1.5 are deemed to be an acceptable item fit. PCAR was conducted to assess the uni-dimensionality of the DSCS. Uni-dimensionality is supported if the variance of Rasch factor in Rasch is >50% and eigenvalues of unexplained variance are not greater than 2 (41). Differential item functioning (DIF) was also conducted to determine whether the DSCS items were invariant across participants' age, spouse's age, sexual function and sexual distress groups. A DIF greater than 0.5 indicates substantial DIF (41).

## **Results**

*Description of demographic characteristics:* In the present study, the 400 married women of reproductive age had a mean age of 35.66 years. The mean age of their spouses was 39.66 years. The average number of times of monthly sexual intercourse was 6.29. Half of the participants had more than 10 years of marriage duration. The majority of participants (71%) and their spouses (63.5%) had university education. More than half of the participants were housewives and 91.8% of their spouses were employed. The majority of participants had moderate economic family status and half of them had moderate life satisfaction. The demographic characteristics of the participants are shown in Table 1.

### *Psychometric properties*

Construct validity of the DSCS was examined using both CFA and Rasch analysis. Fit for the uni-dimensional CFA model was excellent: CFI=0.983; TLI= 0.980; RMSEA=0.043; and SRMR=0.065 (Table 2). All factor loadings were significant and ranged from 0.312 to 0.818

(Table 3). The convergent validity of the DSCS was found to be poor as AVE was  $<0.5$  but CR  $>0.6$  (Table 3). The uni-dimensionality of the DSCS was confirmed as the first residual component in PCAR had an eigenvalue 1.85 (below 3.00) with 8.6% (less than 10%) of the unexplained variance (42). As Table 2 shows, all 13 items of the DSCS were within the acceptable interval of 0.5 to 1.5, with the exception of Item 6 (“*My partner often complains that I am not very clear about what I want sexually*”) and Item 13 (“*I seldom feel embarrassed when talking about the details of our sex life with my partner*”). The most difficult item was Item 9 (“*Even when angry with me, my partner is able to appreciate my views on sexuality*”), whereas the easiest item was Item 4 (“*My partner and I never seem to resolve our disagreements about sexual matters*”) (Table 2). Results of the DIF showed that all items of the DSCS had DIF  $<0.5$  indicating invariance for participants’ age, spouse’s age, sexual function status and sexual distress status groups (Table 2). The internal consistency of the DSCS was found to be acceptable as assessed by Cronbach’s alpha ( $\alpha=0.876$ ). Concurrent validity was analyzed using Pearson correlation coefficients and the DSCS was positively correlated with scores on the MIS ( $r=.64$ ) and FSFI ( $r=.65$ ), and negatively correlated with scores on the FSDS ( $r=-.61$ ). These findings verified the concurrent validity of the Persian DSCS.

## **Discussion**

The DSCS has been used to differentiate between individuals who report sexual problems and individuals who do not report sexual problems, and how individuals communicate with their sexual partner. The way couples communicate with each other is an important factor that is closely related to their sexual satisfaction in marital life (43). Few studies have focused on how couples communicate about sex (44). Couples’ sexual communication is a way to improve the quality of couples’ relationship (45). Many sexual health professionals recommend their clients to talk to their partner, which is considered one of the main components of treatment and is considered an educational element (46, 47). Considering the importance of this concept, it is very useful to use a

valid and reliable scale to assess this concept. One of these scales is the DSCS (31). The present study investigated the psychometric properties of DSCS in the context of Iranian society.

The psychometric properties of the DSCS have been assessed in previous studies (32, 48, 49). Similar to the original Persian validation study of the DSCS (Alizadeh et al., 2020), the present study conducted CFA to evaluate the scale's construct validity. However, the present study's results are arguably more robust than the original Persian DSCS validation study. First, Alizadeh et al. conducted both principal components analysis (PCA) and CFA on the same data. Theoretically, exploratory factor analysis and PCA are different statistical techniques and produce different outcomes (50). EFA is a data-reduction approach that can be used when researchers want to evaluate a latent variable that cannot be directly assessed (e.g., sexual communication) whereas PCA is a data-reduction approach that reduces dimensionality of data to be more parsimonious (51). Therefore, the authors have used PCA rather than EFA. Conversely, in the original Persian DSCS validation study, CFA was used to evaluate the factor structure of the DSCS. However, it is not clear which estimator was used on the ordinal data of the DSCS in the original Persian version. The estimator can affect factor loading. It has been recommended that researchers use maximum likelihood (ML) if observed variables (i.e., items) are continuous with multivariate normal distribution. However, due to the ordinal nature of the DSCS data, ordinal estimators can be used when the normality assumption is violated (40). Therefore, the results of the PCA and CFA are not necessarily reliable in the previous Persian DSCS validation study.

To determine reliability, internal consistency with Cronbach's alpha coefficient was used (52). Internal consistency is considered good and sufficient when the Cronbach's alpha coefficient is between 0.7 and 0.95 (53). In the present study, the alpha coefficient was 0.88 which indicates a very good internal consistency. All previous psychometric studies related to this issue from 2015 to 2020 show the high internal consistency of the DSCS (48, 54-56).

The fact that the DSCS was positively correlated with scores on the MIS and FSFI, and negatively correlated with scores on the FSDS, verified the concurrent validity of the Persian DSCS. Based on Walker and Almond (2010), correlations of 0.6 to 1 shows strong correlation and acceptable concurrent validity. Similar values were reported by Pazmany et al. (2015). They report the correlation coefficients of 0.56, -0.62 between DSCS and FSFI, FSDS, respectively. Other studies have also reported high correlation coefficients between the DSCS and FSFI, FSDS, and MIS (54, 57).

**Limitation.** Some limitations should be considered when interpreting the study findings. Self-report method to complete the questionnaires might increase the social desirability bias, as expressing sexual related issues is not culturally accepted among Iranian women, this might lead to exaggerated or underreported their sexual activity due to embarrassment. The other point is regarding study population which were healthy reproductive age women from Iranain context, so the generalizability of findings to women from other cultures, other age group and also women with chronic physical and psychological conditions is limited. Also, spouses were not assessed simoultanously in present study which might limit the understanding dyadic nature of couples' communication regarding sexual issues. Further studies can be designed considering these limitations.

## **Conclusion**

Based on psychometric testing, the Persian DSCS has good validity and reliability. Therefore, the tool can be used to assess female's sexual communication in the context of sexual relationships. The study contributes to the growing body of literature indicating that the Persian DSCS is useful in assessing sexual communication with various populations, including females from Iran

## **Declarations:**

**Ethics approval and consent to participate:** The present study was performed in accordance with relevant guidelines and regulations (declarations of Helsinki). So, the study protocol was reviewed and approved in institutional research council and ethics committee in biological research of Qazvin University of Medical Sciences with decree code of QUMS.REC.1398.019. Written informed consent for their voluntary participation was obtained from individuals, and their confidentiality and anonymity were ensured.

- **Consent for publication:** Not applicable
  
- **Availability of data and materials:** Data and material will be provided via email to corresponding author.
  
- **Competing interests:** None of the authors have any conflict of interest to declare
  
- **Funding:** No funding was received.
  
- **Authors' contributions:** ZA & NB contributed to the conception and design of the study, SG contributed to the design of this study and data collection, ZA contributed to data analysis and interpretation of data. ZA, SG & NB drafted the manuscript, MDG provided contributions to the literature review and discussion and substantially edited the primary manuscript and prepared the final version of the manuscript. All authors revised the manuscript, agreed to be fully accountable for ensuring the integrity and accuracy of the study, and read and approved the final version of the manuscript to be published. All the authors met the criteria for authorship, and they are listed as co-authors on the title page.
  
- **Acknowledgements:** Not applicable

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**Table 1- Demographic characteristics of participants**

<b>Categorical Variables</b>		<b>No (%)</b>
Marriage duration	Less than one year	21 (5.3)
	1 to 5 years	72 (18)
	5 to 10 years	104 (26)
	More than 10 years	203 (50.7)
Women's educational status	Elementary	3 (0.8)
	Guidance	13 (3.3)
	High school and diploma	99 (24.9)
	Academic	284 (71)
Spouse's educational status	Elementary	11 (2.7)
	Guidance	25 (6.3)
	High school and diploma	110 (27.5)
Women's occupational status	Academic	254 (63.5)
	Housewife	219 (54.7)
	Employed	181 (45.3)
Spouse's occupational status	Unemployed	18(4.5)
	Employed	299 (74.7)
	Retired	83 (20.8)
Perceived economic status	Poor	43 (10.8)
	Moderate	274 (68.4)
	Good	83 (20.8)
Life satisfaction	Low	28 (7)
	Moderate	200 (50)
	High	131 (32.8)
	Very high	41 (10.2)
	None	88 (22)
Number of children	1	141 (35.2)
	2	150 (38)
	3 or more	19 (4.8)
Have a separate bedroom	No	86 (21.5)
	Yes	314 (78.5)
Contraceptive method	No contraception	35 (8.8)
	Ligation (TL + vasectomy)	20 (5)
	oral contraceptive pills	209 (52.2)
	Condom	104 (26)
	Ampoule	32 (8)
<b>Continuous Variables</b>		<b>Range</b>
Age (years)	Range: 19-50	35.66 (7.16)
Spouse's age (year)	Range: 25-68	39.66 (7.55)
Frequency of intercourse (No/ monthly)	Range: 0-30	6.29 (4.93)

**Table 2- Psychometric properties of the Dyadic Sexual Communication Scale at**

scale level		
Psychometric testing	Value	Suggested cutoff
Internal consistency (Cronbach's $\alpha$ )	0.876	>0.7
Confirmatory factor analysis		
$\chi^2$ ( <i>df</i> )	113.490 (65)*	Nonsignificant
Comparative fit index	0.983	>0.9
Tucker-Lewis index	0.980	>0.9
Root-mean square error of approximation	0.043	<0.08
Standardized root mean square residual	0.065	<0.08
Average variance extracted	0.38	>0.5
Composite Reliability	0.88	>0.6
Item separation reliability from Rasch	0.95	>0.7
Item separation index from Rasch	4.51	>2
Person separation reliability from Rasch	0.71	>0.7
Person separation index from Rasch	1.58	>2

Table 3- Psychometric properties of the Dyadic Sexual Communication Scale at item level

Item #	Analyses from classical test theory		Analyses from Rasch							
	Factor loading <sup>a</sup>	Item-total correlation	Infit MnSq	Outfit MnSq	Difficulty	Discrimination	DIF contrast across age <sup>cd</sup>	DIF contrast across time on spouse age <sup>cc</sup>	DIF contrast across sexual function status <sup>cc</sup>	DIF contrast across sexual distress status <sup>cc</sup>
DSC1	0.504	.473	1.26	1.25	-0.11	0.97	0.00	-0.13	-0.10	0.09
DSC2	0.604	.573	0.98	0.96	-0.08	1.02	0.16	0.15	0.00	0.00
DSC3	0.718	.671	0.85	0.84	-0.04	1.22	0.11	0.00	0.33	-0.08
DSC4	0.697	.645	0.97	0.75	-0.25	1.26	-0.08	-0.10	0.47	-0.48
DSC5	0.647	.615	0.87	0.71	-0.36	1.16	-0.07	-0.02	0.26	-0.32
DSC6	0.353	.327	1.46	1.92	-0.13	0.71	0.13	0.14	-0.13	0.09
DSC7	0.747	.699	0.85	0.75	0.05	1.33	0.10	0.0	0.20	-0.16
DSC8	0.435	.410	1.37	1.58	0.09	0.80	-0.21	-0.10	-0.23	0.22
DSC9	0.525	.498	1.14	1.36	0.42	0.67	-0.13	-0.09	-0.19	0.15
DSC10	0.661	.617	0.82	0.80	0.01	1.07	-0.07	0.07	0.12	-0.14
DSC11	0.818	.761	0.54	0.46	0.05	1.28	-0.05	0.00	0.12	-0.10
DSC12	0.726	.683	0.70	0.77	0.07	1.12	0.10	0.07	0.04	0.00
DSC13	0.312	.293	1.49	2.27	0.28	0.15	0.00	0.00	-0.38	0.40

<sup>a</sup> Based on confirmatory factor analysis.  
<sup>b</sup> Using Pearson correlation.  
<sup>c</sup> DIF contrast > 0.5 indicates substantial DIF.  
<sup>d</sup> DIF contrast across gender=Difficulty for females-Difficulty for males.  
MnSq=mean square error; DIF=differential item functioning.