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Psychometric properties of the Iranian version of the Sexual Modes Questionnaire (SMQ): to assess the association between automatic thoughts, emotions and sexual response

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ABSTRACT

The role of cognitive-affective factors on male and female sexual functioning has been studied in North America and European countries and there is a lack of validated measures available for use elsewhere. The aim of this study was to translate and validate the Sexual Modes Questionnaire (SMQ) to the Iranian context. The SMQ is a validated measure aimed at assessing the association between thoughts, emotions and sexual response during sexual activity. A total of 388 participants (224 women and 164 men) completed the SMQ. A principal component analysis with varimax rotation and subsequent confirmatory factor analysis (CFA) were performed. Three factors were identified in the male version: Failure Anticipation Thoughts, Erection Concern Thoughts, and Lack of Erotic Thoughts. In the female version, six factors were identified: Failure and Disengagement Thoughts, Low Self-Body Image Thoughts, Sexual Abuse Thoughts, Sexual Passivity and Control, Lack of Erotic Thoughts, and Partner's Lack of Affection. Also, a consistent pattern of correlations was found between the three subscales of the SMQ (thoughts, emotions, and sexual response) supporting the interactional character of the measure. This study has provided some preliminary evidence of the reliability and validity of the SMQ for use in Iranian populations.

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Introduction

Beck's "Modes Theory" (1996) argues that people's perceptions of situations are mediated by cognitive schemas or core beliefs that are activated in those situations. These cognitive structures (schemas or core beliefs) prompt automatic thoughts, which reflect the content of more central structures of the cognitive system. In effect, these thoughts reflect the meaning assigned to a specific situation and are associated with emotional and behavioral

responses to that situation (Beck, 1996). Automatic thoughts are major focus in cognitive therapies (Beck, 1995).

Several studies have indicated the role of cognitive-affective factors in sexual response (SR) and sexual health (Andersen, Cyranowski, & Espindle, 1999; Cranston-Cuebas & Barlow, 1990; Sbrocco & Barlow, 1996). For example, cognitive distraction (Beck, Barlow, Sakheim, & Abrahamson, 1987; Dove & Wiederman, 2000; Elliot & O'Donohue, 1997), efficacy expectancies (Bach, Brown, & Barlow, 1999; Creti & Libman, 1989; Palace, 1995), perfectionism (Dibartolo & Barlow, 1996), and causal attributions (Weisberg, Brown, Wincke, & Barlow, 2001) are examples of cognitive factors that influence sexual functioning. Several clinical studies have indicated that individuals with sexual dysfunction focus their attention on negative thoughts rather than sexual erotic thoughts (Géonet, De Sutter, & Zech, 2013; Nobre, 2003, 2010; Nobre, Pinto-Gouveia, & Gomes, 2003) which lead to a decrease in subjective and physiological sexual arousal in both men and women (Dove & Wiederman, 2000; Elliot & O'Donohue, 1997; Farkas, Sine, & Evans, 1979; Przybyła & Byrne, 1984). However, the content of negative thoughts is distinct in men and women. For example, in men thoughts related to performance concerns and failure anticipation are more prevalent (Bonierbale, Clement, Loundou, & et al., 2006; Nelson & Purdon, 2011; Nobre & Pinto-Gouveia, 2008; Rosen, Leiblum, & Spector, 1994; Zilbergeld, 2003), whereas in women negative thoughts during sexual activity are frequently related to self-body image concerns, failure and disengagement, and sexual abuse (Dove & Wiederman, 2000; Nobre et al., 2003; Nobre & Pinto-Gouveia, 2003, 2006, 2008).

Barlow (1986) developed a cognitive-affective model for sexual dysfunction. The model suggested that men and women without sexual dysfunction experience positive affect, and efficacy expectancies, as well as a perception of control in response to implicit or explicit demands for sexual performance. In contrast, individuals with sexual dysfunction focus their attention on negative thoughts regarding social consequences of not performing, failure expectancies or other non-erotic concerns (Barlow, 1986).

Nobre and Pinto-Gouveia have conducted a series of research studies about the role of cognitive and emotional factors on sexual dysfunction (Nobre & Pinto-Gouveia, 2003, 2008). The authors found that during sexual activity, women with sexual dysfunction presented significantly more failure and disengagement thoughts, thoughts about being abused and disrespected by the partner, and lack of erotic thoughts, while men with sexual dysfunction reported significantly more thoughts related to erection concerns and sexual intercourse, failure anticipation and its consequences, and lack of erotic thoughts. For both men and women, these automatic thoughts were associated with negative emotions such as sadness, disillusion, guilt, anger, as well as with lack of pleasure and satisfaction (Nobre, 2009; Nobre & Pinto-Gouveia, 2003, 2006, 2008). In another study, Nobre and Pinto-Gouveia (2008) found that cognitive and emotional variables were significant predictors of specific sexual dysfunctions. In women, hypoactive sexual desire disorder was associated with failure/disengagement thoughts; while automatic thoughts focusing on self-body appearance were strongly correlated with orgasmic disorder.

The Sexual Modes Questionnaire (SMQ; Nobre & Pinto-Gouveia, 2003) is a measure developed in accordance with Beck's Modes Theory (1996), and assessing the interaction between automatic thoughts, emotions and SR, during sexual activity. The original SMQ

has two versions (male and female). The male version consists of 30 items and assesses five dimensions: Failure anticipation thoughts (e.g. “It would be better to die than to be like this,” “I’m condemned to failure”); Erection concern thoughts (e.g. “I must be able to have intercourse,” “I must achieve an erection”); age and body function-related thoughts (e.g. “I’m getting old,” “She doesn’t find my body attractive anymore”); Negative thoughts toward sex (e.g. “This is disgusting,” “This way of having sex is immoral”); and Erotic thoughts (e.g. “This is turning me on,” “I’m the happiest man on earth”). The female version consists of 33 items and assesses six dimensions: Sexual abuse thoughts (e.g. “He is abusing me”, “He only wants to satisfy himself”); Failure and disengagement thoughts (e.g. “I’m not getting turned on”, “I can’t feel anything”); Partner’s lack of affection (e.g. “He is not being as affectionate as he used to,” “Why doesn’t he kiss me?”); Sexual passivity and control (e.g. “I must not show that I’m interested,” “If I let myself go he is going to think I’m promiscuous”); Erotic thoughts (e.g. “The way he is talking turns me on,” “Making love is wonderful”); and Low self-body image thoughts (e.g. “I’m getting fat/ugly,” “I’m not feeling physically attractive”).

According to the cognitive-emotional model of sexual dysfunction (Nobre, 2013), both automatic thoughts and emotional responses (ERs) during sexual activity play a significant role in determining SR in men and women (Nobre, Pinto-Gouveia, & Gomes, 2006). Culture plays a private role in sexual attitudes (Montemurro, Bartasavich, & Wintermute, 2015), and such attitudes greatly impact the perceptions about sexual needs and feeling in life (Deacon, Minichiello, & Plummer, 2006). In the context of Islam, sexual activity is generally considered an aspect of the marriage contract, and includes a set of rights and obligations for each partner (Mir Hosseini, 2006). Sexual obedience is a core religious principle in line with Islamic principles and values and is clearly described in the original Islamic sources as one of the items of marital contract; broken if the husband does not agree to the responsibilities accepted by himself in the marital contract. Based on the cultural and religious traditions, it is considered that a man’s sexual drive is stronger than a woman’s and requires satisfaction. So, the wife has to be always sexually prepared for her husband, otherwise she would be judged negatively in the after-life (Merghati Khoei, Whelan, & Cohen, 2008). A recent research study in Iranian women showed that 41.5% women reported that their husbands always initiated sexual relations, and they never did so, believing that they might face unexpected reactions from their husbands (Hashemi, Seddigh, Ramezani Tehrani, Hasanzadeh Khansari, & Khodakarami, 2013). These findings reflect the fact that traditionally men have been allocated the role of initiator of sex while women have been assigned the role of preserver of sexual relationships and have been expected to maintain harmonious relations as part of their obligations (Hawkes, 1996). Insofar as such ideas remain current in Iranian society they may prevent women from expressing their sexual preferences in sexual relations, and impact on their sexuality (Hashemi et al., 2013). In this context then, the purpose of the present study was to examine the psychometric properties of the SMQ (Nobre & Pinto-Gouveia, 2003) in the Iranian context, in order to enable assessment of cognitions and emotions during sexual activity. Moreover, it is hoped that the validation of the SMQ (Nobre & Pinto-Gouveia, 2003) in the Iranian context will facilitate further studies for improving the knowledge of the role of cognitive and emotional factors on sexual health in that country, and expand targeted and culturally competent interventions.

Table 1. Sociodemographic characteristics of the sample ($N = 388$).

	Female ($n = 224$)	Male ($n = 164$)
Age		
<i>M</i>	29.82	30.65
Min–Max	18–54	20–50
<i>SD</i>	8.78	7.27
Educational level		
< 9 years	2.5	10.6
10–12 years	17.2	37.2
> 13 years	79.8	52.1

Method

Participants and procedures

In total, 164 men and 224 women participated in the current study. Participants were recruited in different regions of Qom city and Tehran city between March and June 2014. The study was approved by the Ethical Committee of the Tarbiat Modares University in Iran. Participants were recruited door by door using a convenience sampling method in different regions of the city, including health centers and universities. Volunteers received a brief explanation of the study from a researcher, and were invited to take part and sign an informed consent form. After signing, the participants were asked to complete the Iranian version of the SMQ in a private location. Questionnaire was then delivered directly to the researcher. No incentives were given. The participants were excluded if they reported suffering from a mental or psychiatric disorder, if they did not identify themselves as heterosexual, if they were not in a relationship, or if they had not been sexually active in the past three months. Target sample size was estimated based on the number of items in the questionnaire multiplying by 5 (in the male version with 30 items = 150; and in the female version with 33 items = 165) (Munro, 2004). However, the actual sample size for this study was 164 and 224 in men and women, respectively. The mean age of men in the study was 30.66 years ($SD = 7.28$), and for women was 29.82 years ($SD = 8.78$). The sociodemographic characteristics of the sample are shown in Table 1.

Measures

Sociodemographic information

Participants answered to a brief sociodemographic measure assessing age and educational level information.

The Sexual Modes Questionnaire (SMQ) – original version

The SMQ (Nobre & Pinto-Gouveia, 2003) is a measure for assessing automatic thoughts, emotions, and SR during sexual activity. The questionnaire is composed of an automatic thought subscale (AT), and also assesses ER, and SR ratings in relation to automatic thought items. The AT has a male and a female version. The male version consists of 30 items and the female version consists of 33 items that evaluate automatic thoughts presented during sexual activity. The participants rate the frequency in which they have experienced specific automatic thoughts during sexual activity, using a response scale ranging

from 1 (never) to 5 (always). A factor analysis of the male version identified five dimensions: failure anticipation and catastrophizing thoughts, erection concern thoughts, age and body function-related thoughts, Negative thoughts toward sex, and Erotic thoughts. For women six dimensions were identified: Sexual abuse thoughts, Failure and disengagement thoughts, Partner's lack of affection, Sexual passivity and control, Erotic thoughts, and Low self-body image thoughts. Cronbach's alpha figures (0.88 for the male and 0.87 for the female version) indicated good internal consistency for both scales (Nobre & Pinto-Gouveia, 2003). The ER component is composed of 30 items in the male version and 33 items in the female version that evaluate emotions reported by the participants during sexual activity. The items are directly connected to the items of the automatic thought subscale. So, for each automatic thought, participants indicate their ER. A list of ten emotions is presented (worry, sadness, disillusion, fear, guilt, shame, anger, hurt, pleasure, and satisfaction) and participants are asked to check which of them are usually experienced whenever they endorse each automatic thought. An index for each ER is calculated based on the number of times each emotion is endorsed, divided by the total number of emotions endorsed. The SR component has 30 items in the male version and 33 items in the female version and is aimed at assessing the subjective SR experienced during sexual activity (subjective sexual arousal). The items are directly connected to the items of the automatic thought subscale. For each automatic thought presented the participants are asked to rate the intensity of their subjective sexual arousal on a 5-point scale ranging from 1 (very low) to 5 (very high). An index of SR is calculated based on the formula: Sum of the SRs for each item, divided by the total number of SR items endorsed. The index based on this formula provides an indication of the average SR (subjective sexual arousal) experienced by the participants during sexual activity.

Linguistic adaptation

The SMQ (Nobre & Pinto-Gouveia, 2003) was translated into Persian by two researchers independently. The two translated versions were then compared and a single Persian provisional version was produced. The provisional Persian version was translated back into English by an English expert. The English version was checked with the original questionnaire. This version was tested in a pilot study with 10 women and men in order to identify any possible problem with the questionnaire items before the final Persian version of the SMQ was produced.

Statistical analysis

Psychometric properties of the Iranian version of the SMQ (Nobre & Pinto-Gouveia, 2003) were assessed as follows.

Validity

Exploratory factor analysis was performed to determine the underlying constructs of the questionnaire, and to estimate construct validity, Varimax rotation was applied.

Convergent validity

To assess convergent validity, we used measures of male and female Sexual Dysfunctional Beliefs Questionnaire (SDBQ; Nobre, Pinto-Gouveia, & Gomes, 2003).

Sexual Dysfunctional Beliefs Questionnaire – male version (SDBQ)

The SDBQ – male version (Nobre et al., 2003) is a 40-item self-reported measure that allows assessing sexuality-related beliefs. Participants answered the questions with a 5-point Likert scale. Five domains can be assessed: Sexual conservatism, “Macho” beliefs, Beliefs about partner’s sexual satisfaction, Restrictive attitudes toward sex, Sex as an abuse of men’s sexual power, and Partner’s sexual power. Scales were computed as sums with higher scores indicating more dysfunctional sexual beliefs. Psychometric studies supported test–retest reliability ($r = .73$), discriminant validity and internal consistency (Cronbach alpha value of .93) of the questionnaire (Nobre et al., 2003). Psychometric properties of Iranian version questionnaire showed excellent internal consistency (.84 Cronbach’s alpha value) (Abdolmanafi et al., 2015).

Sexual Dysfunctional Beliefs Questionnaire – female version (SDBQ)

Female version (Nobre et al., 2003) is a 40-item self-reported measure assessing beliefs related to sexuality. The SDBQ – female version assesses six dimensions: sexual conservatism, sexual desire and pleasure as sin, age-related beliefs, body-image beliefs, motherhood primacy, and affection primacy. Psychometric studies indicated good test–retest reliability ($r = .80$), internal consistency (Cronbach’s alpha = .81), and discriminant validity (Nobre et al., 2003). Psychometric properties of Iranian version questionnaire showed excellent internal consistency (.82 Cronbach’s alpha value) (Abdolmanafi et al., 2015).

Reliability

Internal consistency was assessed using Cronbach’s alpha. Values equal to or greater than 0.70 were considered satisfactory (Cronbach, 1951). In addition, to estimate the questionnaire’s temporal stability, test–retest reliability was examined using the intraclass correlation coefficient (ICC). Thirty participants completed the questionnaire twice with a four-week interval. ICC values of 0.40 or above were considered satisfactory.

Correlation between the questionnaire subscales

In order to assess the pattern of associations between the cognitive, emotional, and behavioral dimensions, correlations were calculated between the automatic thought, ER, and SR dimensions.

Results

Validity and reliability analysis of the SMQ – male version

To explore the factor structure of the Iranian version of the SMQ – Male Version, an exploratory factor analysis using principal component analysis (PCA) was conducted on the 30 items that constitute the Automatic Thought Subscale, with Varimax Rotation.

Table 2. Male automatic thought subscale principal component analysis with varimax rotation ($N = 164$).

Automatic thought items	Factors		
	1	2	3
Factor 1: failure anticipation thoughts			
21. She doesn't find my body attractive anymore	.827		
7. I'm not satisfying her	.813		
9. I'm not penetrating my partner	.733		
28. It will never be the same again	.726		
4. I'm condemned to failure	.708		
16. If I fail again I'm a lost cause	.687		
19. If I don't climax now, I won't be able to later	.685		
20. She is not being as affectionate as she used to	.670		
11. Why isn't this working?	.662		
10. My penis is not responding	.649		
3. She will replace me with another guy	.645		
24. This way of having sex is immoral	.620		
23. This is disgusting	.579		
15. What if others knew I'm not capable...	.569		
25. Telling her what I want sexually would be unnatural	.522		
22. I'm getting old	.517		
6. This is not going anywhere	.513		
Factor 2: lack of erotic thoughts			
17. I'm the happiest man on earth*		.781	
14. These movements and positions are fabulous*		.726	
26. She is really turned on*		.666	
18. This is turning me on*		.645	
Factor 3: erection concern thoughts			
8. I must achieve an erection			.637
2. This time I cannot disappoint my partner			.617
12. I wish this could last longer			.581
13. What is she thinking about me?			.572
5. I must be able to have intercourse			.554
29. If I can't get an erection, I will be embarrassed			.547
27. I must show my virility			.511
Excluded items			
1. It would be better to die than be like this			.379
30. I've other more important matters to deal with	.365		

Note: * Items scored in reverse order.

The Kaiser–Meyer–Olkin (KMO) supported the adequacy of the sample ($KMO = 0.816$), and Bartlett's test of sphericity suggested that correlations between items were large enough for a PCA ($\chi^2(378) = 2333.429, p < .001$). The PCA identified three factors accounting for 51% of total variance. The item selection for each component was based on loadings higher than .40 on the respective factor. Items not loading significantly on any of the factors extracted or presenting factor loadings lower than .40 were excluded. Two items were excluded: 1. "It would be better to die than be like this, 30." I've other more important matters to deal with". Table 2 shows the component loadings for each item, after varimax rotation.

The inter-correlations between the different factors of the automatic thoughts subscale in the male version indicated a consistent pattern of associations. The factors were positively and significantly associated (Table 3). Table 4 shows the item numbers for each dimension as well as means, standard deviations and range.

Test–retest reliability for the male version was assessed by two consecutive administrations of the questionnaires with a four-week interval. Results showed statistically significant correlations for the total scale ($r = 0.71$). Finally, internal consistency was evaluated

Table 3. Male automatic thought factors intercorrelations ($N = 164$).

Factors	F1	F2	F3
Failure anticipation thoughts	–	–.157*	.199*
Lack of erotic thoughts		–	.282**
Erection concern thoughts			–

Note: * $p < .05$; ** $p < .01$.

using Cronbach's alpha statistic for the total scale ($\alpha = .86$) as well as for each of the three dimensions (alphas ranging from .70 and .92).

Based on the PCA in Iranian male version of the SMQ, a three-factor model was hypothesized for the CFA. Further included in the analysis was a five-factor model (following the five-factor structure used in the original male version of the SMQ) to be compared with the three-factor model. While the five-factor structure derived from the original model showed poor adequate fit to the data ($X^2 = 949.29$, $df = 314$, $CFI = 0.84$, $GFI = 0.78$, $NFI = 0.73$, and $RMSEA = 0.108$), the three-component structure derived from the PCA showed an adequate fit, with GFIs being satisfactory in terms of their recommended relative thresholds ($X^2 = 765.60$, $df = 344$, $CFI = 0.90$, $GFI = 0.87$, $NFI = 0.89$, and $RMSEA = 0.08$). The result of path diagram is shown in [Figure 1](#) using maximum-likelihood (ML) method. All standard coefficients were significant ($p < .05$). Moreover, the distribution of the data was assessed with the Shapiro–Wilks' W -test. All domains of the SMQ were normally distributed (Shapiro–Wilks W -test range from 0.74 to 0.91, $p > .05$).

Validity and reliability analysis for the SMQ – female version

To explore the factor structure of the female version from the Iranian version of the SMQ, an exploratory factor analysis, using PCA was conducted on the 33 items that constitute the Automatic Thought Subscale, with Varimax Rotation. The KMO supported the adequacy of the sample ($KMO = 0.830$), and Bartlett's test of sphericity suggested that correlations between items were large enough for a PCA ($\chi^2 (528) = 2630.534$, $p < .001$). The PCA identified six factors accounting for 51.2% of total variance. The item selection for each component was based on loadings higher than .40 on the respective factor. Items not loading significantly on any of the factors extracted or presenting factor loadings lower than .40 were excluded. Three items were excluded: 5. "The way he is talking turns me on"; 7. "This way of having sex is immoral"; and 28. "He only loves me if I'm good in bed." [Table 5](#) shows the component loadings for each item, after varimax rotation.

The inter-correlations between the different factors of the female automatic thoughts subscale indicated a strong pattern of associations ([Table 6](#)). The items, range, means and standard deviations of each of the automatic thoughts dimensions are presented in [Table 7](#).

Table 4. Means, standard deviations, minimums, and maximums of male AT factors.

Factors	Item numbers	Means	SD	Minimum	Maximum
Failure anticipation thoughts	3,4,6,7,9,10,11,15,16,19,20,21,22,23,24,25, 28	33.04	10.50	17	57
Lack of erotic thoughts	14,17,18,26	13.38	3.81	4	20
Erection concern thoughts	2,5,8,12,13,27,29	18.37	5.27	7	35

Note: Items 14, 17, 18, and 26 are scored in reverse order.

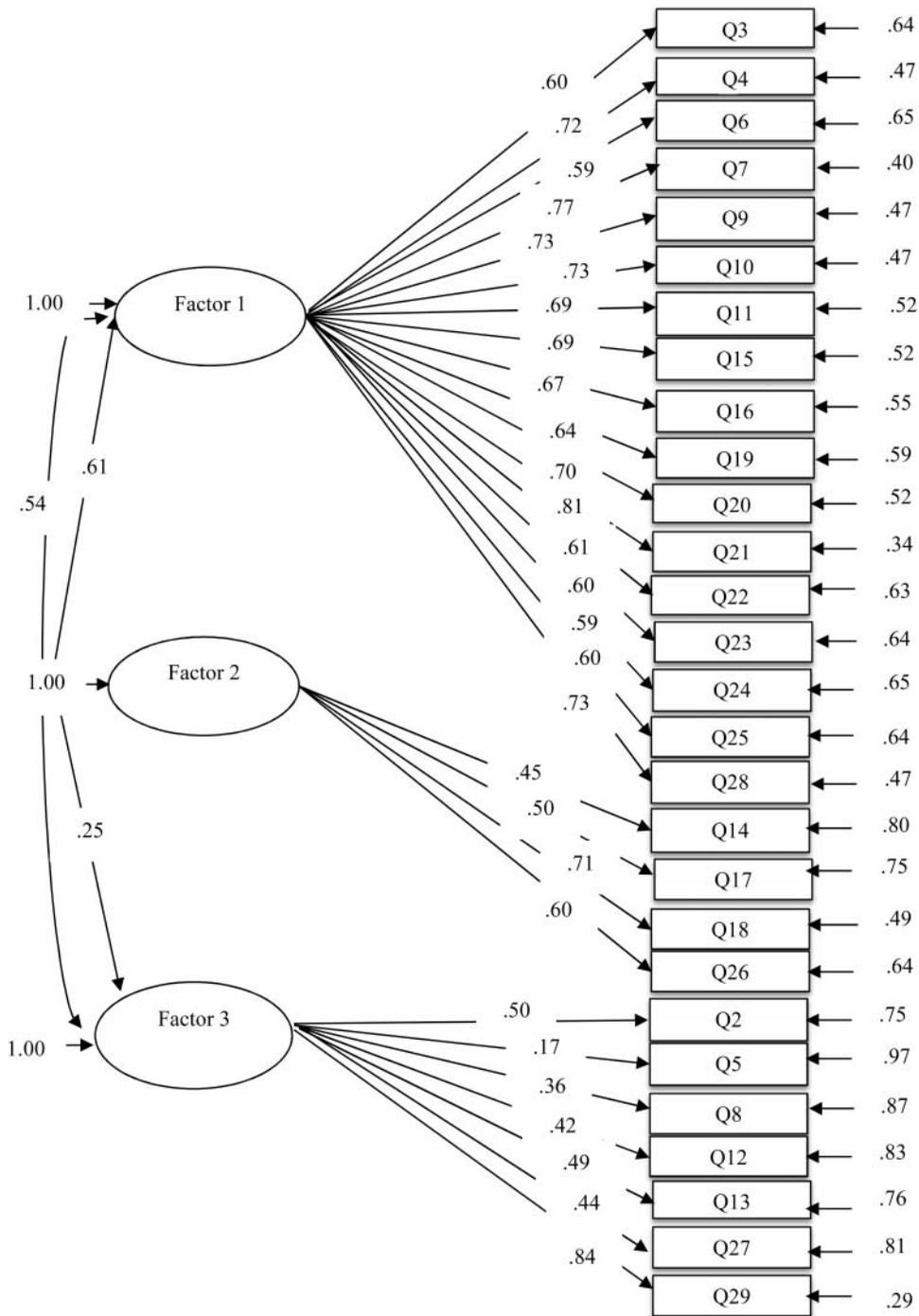


Figure 1. Male automatic thought subscale confirmatory factor analysis.

Table 5. Female automatic thought subscale principal component analysis with varimax rotation ($N = 224$).

Automatic thought items	Factors					
	1	2	3	4	5	6
Factor 1: failure and disengagement thoughts						
22. I can't feel anything	.675					
2. How can I get out of this situation?	.662					
26. When will this be over?	.618					
32. I have other more important matters to deal with	.601					
15. This is disgusting	.583					
30. I'm only doing this because he asked me to	.576					
19. I'm not getting turned on	.503					
21. These activities shouldn't be planned ahead of time	.429					
Factor 2: low self-body-image thoughts						
16. I'm not as physically attractive as I used to be		.773				
20. I'm not feeling physically attractive		.768				
9. I'm getting fat/ugly		.637				
13. I'm not satisfying my partner		.553				
Factor 3: sexual abuse thoughts						
6. He is violating me			.756			
1. He is abusing me			.662			
12. He is not being as affectionate as he used to			.557			
3. He only wants to satisfy himself			.539			
18. He only cares about me when he wants sex			.502			
4. Sex is all he thinks about			.491			
Factor 4: sexual passivity and control						
17. I should not take the lead in sexual activity				.757		
14. I must not show that I'm interested				.724		
10. If I let myself go he is going to think I'm promiscuous				.675		
29. I should wait for him to make the first movement				.632		
Factor 5: lack of erotic thoughts						
8. These movements and positions are fabulous*					.795	
11. Making love is wonderful*					.773	
31. I'm the happiest woman on earth*					.612	
25. My body turns him on*					.462	
Factor 6: partner's lack of affection						
27. If only he'd whisper something romantic in my ear						.623
24. Why doesn't he kiss me?						.558
33. If I refused to have sex, he will cheat on me						.463
23. I don't want to get hurt emotionally						.450
Excluded items						
5. The way he is talking turns me on					.391	
7. This way of having sex is immoral						.372
28. He only loves me if I'm good in bed		.390				

Note: * Items scored in reverse order.

Test–retest reliability for the female version was assessed by two consecutive administrations of the questionnaires with a four-week interval. Results showed statistically significant correlations for the total scale ($r = 0.83$). Finally, internal consistency was evaluated

Table 6. Female AT factor intercorrelations ($N = 224$).

Factors	F1	F2	F3	F4	F5	F6
Failure and disengagement thoughts	–	.350***	.511***	.439***	.218**	.330***
Low self-body-image thoughts		–	.477***	.402***	.264***	.340***
Sexual abuse thoughts			–	.411***	.235***	.476***
Sexual passivity and control				–	.218**	.326***
Lack of erotic thoughts					–	.049
Partner's lack of affection						–

Note: ** $p < .01$; *** $p < .001$.

Table 7. Means, standard deviations, minimums, and maximums of female AT factors.

Factors	Item numbers	Means	SD	Minimum	Maximum
Failure and disengagement thoughts	2,15,19,21,22,26,30,32	12.67	4.98	8	32
Low self-body-image thoughts	9,13,16,20	6.11	2.79	4	14
Sexual abuse thoughts	1,3,4,6,12,18	8.93	3.85	6	30
Sexual passivity and control	10,14,17,29	6.40	3.43	4	20
Lack of erotic thoughts	8,11,25,31	9.08	3.88	4	20
Partner's lack of affection	23,24,27,33	8.31	3.66	4	20

Note: Items 8, 11, 25 and 31 are scored in reverse order.

using Cronbach's alpha statistic for the total scale ($\alpha = .86$) as well as for each of the 6 dimensions (alphas ranging from .69 and .91).

Based on the PCA in Iranian female version of the SMQ, a six-factor model with 30 items was hypothesized for the CFA and compared with the six factor structure used in the original female version of the SMQ. While the six-factor model for the original female SMQ showed no adequate fit to the data ($X^2 = 926.60$; $df = 419$; $GFI = 0.82$; $CFI = 0.86$; $NFI = 0.83$; and $RMSEA = 0.09$), the six-component structure was confirmed in the new sample, with most GFIs being satisfactory in terms of their recommended relative thresholds ($X^2 = 719.88$; $df = 390$; $GFI = 0.91$; $CFI = 0.95$; $NFI = 0.94$; and $RMSEA = 0.06$). The result of path diagram is shown in [Figure 2](#) using ML method. All standard coefficients were significant ($p < .05$). The distribution of the data was assessed with the Shapiro–Wilks' W -test. All domains of the SMQ were normally distributed (Shapiro–Wilks' W -test range from 0.71 to 0.95, $p > .05$).

Associations between automatic thoughts and emotional response

Correlations between the Automatic Thoughts Subscale and the Emotional Response Subscale were performed for both male and female samples (see [Table 8](#)). For the female sample results showed significant correlations between most of the automatic thoughts factors and negative emotions (mainly sadness and shame), with the exception of disillusion and guilt. Additionally, a very consistent pattern of significant correlations were also found between automatic thoughts and the positive emotions of pleasure and satisfaction. With the one exception of body-image concerns (which was related to low satisfaction only), all automatic thoughts dimensions were negatively correlated with pleasure and satisfaction. Similarly, for the male sample, significant correlations were found between several automatic thoughts dimensions (failure anticipation thoughts, erection concerns, and lack of erotic thoughts) and negative emotions (particularly worry, shame and fear). Moreover, pleasure and satisfaction were negatively correlated with most automatic thoughts dimensions. In sum, both men and women who report having more negative thoughts during sexual activity tend to also experience more negative emotions and less positive emotions.

Associations between automatic thoughts and sexual response

Correlations between the Automatic Thoughts Subscale and the Sexual Response Subscale showed statistically significant negative correlations between automatic thoughts factors

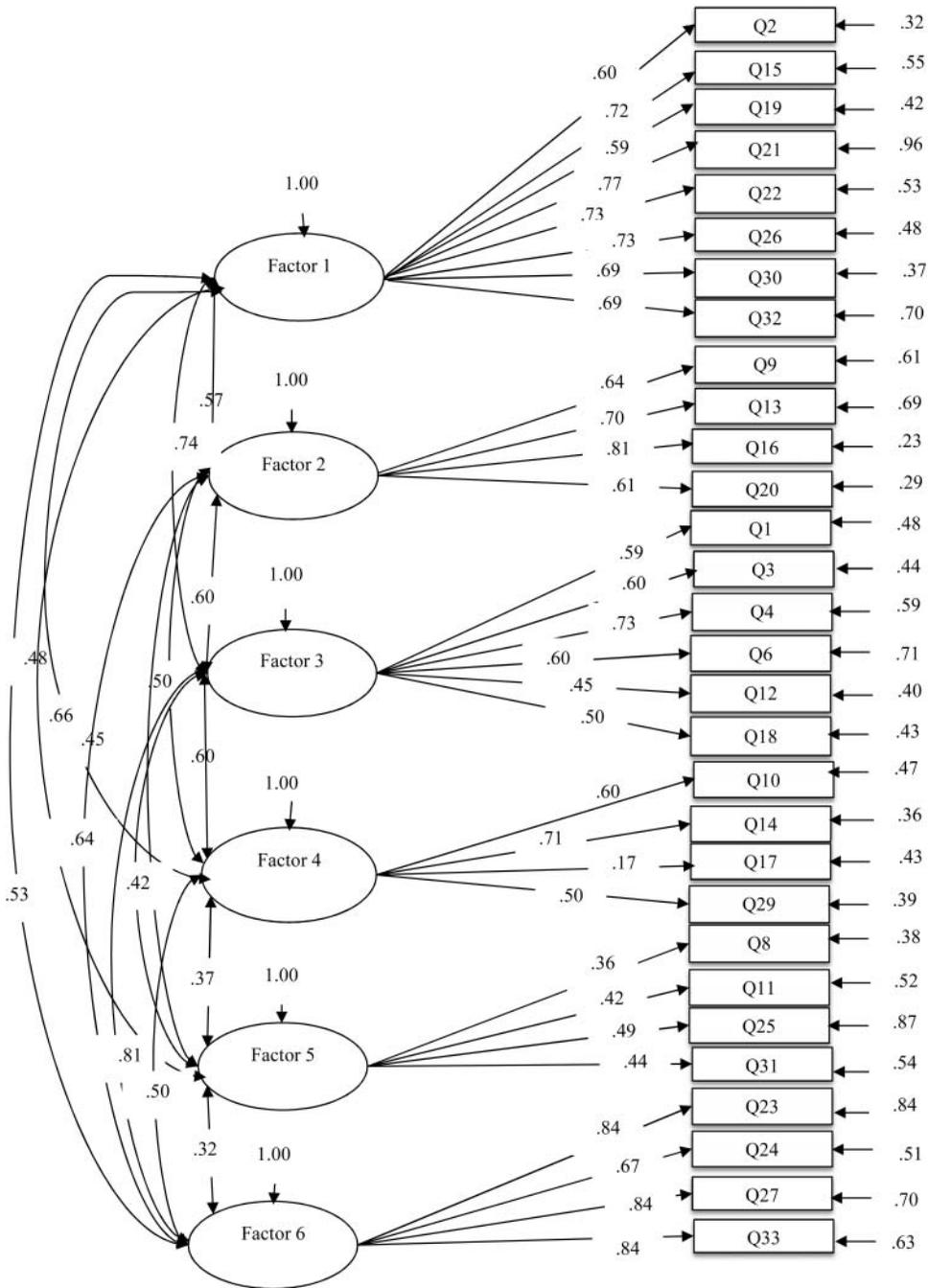


Figure 2. Female automatic thought subscale confirmatory factor analysis.

and SR, with the only exception being for lack of erotic thoughts in the female sample. In men, the same pattern of negative correlations was found (see Table 9). Experiencing more negative thoughts was associated with lower levels of subjective sexual arousal, in both men and women.

Table 8. Correlations of male and female automatic thought subscale factors with the emotional response (ER) indices.

AT factor	ER indices									
	Worry	Sadness	Disillusion	Fear	Guilt	Shame	Anger	Hurt	Pleasure	Satisfaction
Female (n = 224)										
Failure and disengagement thoughts	.134*	.309**	-.047	.120*	.026	.149*	.128*	.100	-.152*	-.123*
Low self-body-image thoughts	.137*	.197**	.064	.043	.008	.133*	.035	.082	-.043	-.116*
Sexual abuse thoughts	.144*	.280**	.028	.065	.065	.177**	.131*	.127*	-.166*	-.120*
Sexual passivity and control	.060	.119*	.017	.120*	.011	.118*	.065	.142*	-.134*	-.134*
Lack of erotic thoughts	.048	.162*	.022	.059	-.102	.022	-.063	-.009	-.203**	-.283**
Partner's lack of affection	.003	.089	.040	.075	.013	.203*	.188**	.055	-.154*	-.123*
Male (n = 164)										
Failure anticipation thoughts	.202*	.162*	.093	.327**	.127	.295**	.212*	.073	-.199*	-.101
Lack of erotic thoughts	.277**	.252**	.166*	.381**	.229**	.212**	.229**	.387*	-.191*	-.236*
Erection concern thoughts	.532*	.034	.042	.233*	.089	.052	-.028	.015	-.305*	-.245*

Note: * $p < .05$; ** $p < .01$.

Associations between emotional and sexual response

Correlations between the Emotional Response Subscale and the Sexual Response Subscale in the female sample showed significant negative correlations between SR and worry, sadness, fear and shame, whereas significant positive correlations were found between SR and positive emotions (pleasure and satisfaction). For the male sample, a significant and negative correlation between SR and worry, sadness, shame, anger, and hurt, as well as a significant and positive correlation between SR and positive emotions (pleasure and satisfaction) (Table 10). In short, for both men and women negative emotions during sexual activity were associated with lower levels of subjective sexual arousal, while positive emotions were correlated to experiencing higher levels of subjective sexual arousal.

Convergent validity

To assess the convergent validity of measure, we used the SDBQ (Nobre et al., 2003) using the Iranian version. We expected that negative automatic thoughts during sexual activity would be correlated with sexual dysfunctional beliefs.

Regarding the correlations between the automatic thought subscale and both male and female sexual beliefs, we found several statistically significant correlations. This shows that automatic thoughts during sexual activity were closely related to sexual beliefs

Table 9. Correlations between the male and female automatic thought subscale factors and the sexual response (SR) index.

AT factor	SR index
Female (n = 224)	
Failure and disengagement thoughts	-.123*
Low self-body-image thoughts	-.132*
Sexual abuse thoughts	-.115*
Sexual passivity and control	-.156*
Lack of erotic thoughts	-.065
Partner's lack of affection	-.117*
Male (n = 164)	
Failure anticipation thoughts	-.128*
Lack of erotic thoughts	-.351**
Erection concern thoughts	-.167*

Note: * $p < .05$; ** $p < .01$.

Table 10. Correlations of the male and female emotional response indices with the sexual response (SR) Index.

Emotional response indices	Sexual response index	
	Female (<i>n</i> = 224)	Male (<i>n</i> = 164)
Worry	-.137*	-.111*
Sadness	-.118*	-.147*
Disillusion	-.069	-.060
Fear	-.145*	-.083
Guilt	-.086	-.071
Shame	-.128*	-.128*
Anger	-.098	-.154*
Hurt	-.067	-.218**
Pleasure	.149*	.157*
Satisfaction	.164*	.124*

Note: * $p < .05$; ** $p < .01$.

(Table 11). Looking at the female sample, the SDBQ total score presented high correlations with sexual Abuse thoughts, lack of erotic thoughts, partner's lack of affection, low self-body-image thoughts, failure and disengagement thoughts. Although sexual passivity and control thoughts did not strongly correlated with the SDBQ total score, they were significantly correlated with beliefs about affection primacy.

Regarding the male sample, there were strong correlations between the SDBQ total scores and failure anticipation thoughts, and lack of erotic thoughts. Erection concern thoughts, although not correlated highly with the SDBQ, showed a statistically significant correlation with the Macho belief dimension.

Discussion

Emotional, cognitive and behavioral dimensions impact on sexual functioning and sexual satisfaction in both women and men (Barlow, 2001; Rosen & Leiblum, 1995). A growing body of research has indicated that automatic thoughts during sexual activity are a result of cognitive schemas or core beliefs. These thoughts are activated in a particular event and associated with emotional and behavioral response to that event (Nobre, 2013; Nobre & Pinto-Gouveia, 2003, 2006). Renaud and Byers (1999) suggested the term “sexual cognition” and defined two categories; negative sexual cognitions and positive sexual cognitions. Positive sexual cognition encompasses thoughts that are acceptable, pleasant, and egosyntonic, while negative sexual cognition is defined as thoughts that are unacceptable, unpleasant and egodystonic. Moyano and Sierra (2012) developed the Sexual Cognitions Checklist (SCC) to assess the negative sexual cognitions and positive sexual cognitions dimensions. Each of these types of cognitions is associated with different psychological processes (Bartels & Gannon, 2011) and some personality traits that predispose and maintain certain sexual dysfunctions (Aslan & Fynes, 2008; Quinta Gomes & Nobre, 2011). Thus, the aim of this study was to assess the association between automatic thoughts, emotions and SR by evaluating the psychometric properties of an Iranian version of the SMQ (Nobre & Pinto-Gouveia, 2003), used with a sample of Iranian men and women. In general, the results of this study demonstrate that the SMQ is a valid and reliable measure for assessing automatic thoughts, related emotions and SR during sexual activity. The results supported the internal consistency of the SMQ, with all dimensions of the SMQ presenting Cronbach's α values meeting the minimum threshold. Test–retest reliability



Table 11. Correlations of the female and male automatic thought subscale factors with the SDBQ domains and total.

AT factors	Female sample (n = 224)							Total
	Sexual conservatism and female sexual passivity	Masturbation-related beliefs	Age-related beliefs	Sexual desire and pleasure as a sin	Denying affection primary	Body-image-related beliefs		
Failure and disengagement thoughts	.108	.028	.075	.018	.244**	.072	.156*	
Low self-body-image thoughts	.12	.075	.012	-.012	.301**	-.002	.155*	
Sexual abuse thoughts	.122	.205**	.159*	-.080	.436**	.150*	.301**	
Sexual passivity and control	.091	.072	.041	-.048	.201**	.018	.120	
Lack of erotic thoughts	.264**	.037	.212**	.133*	.302**	.112	.293**	
Partner's lack of affection	-.002	.217**	.051	-.047	.223**	.090	.164*	
Total	.179**	.153*	.144*	-.006	.432**	.114	.298**	

AT factors	Male sample (n = 164)					Total	
	Sex as an abuse of men's power	Beliefs about women's sexual satisfaction	Sexual Conservatism	Female sexual power	Macho beliefs		Restrictive attitudes towards sex
Failure anticipation thoughts	.152*	.036	.160*	.145*	.064	.045	.166*
Lack of erotic thoughts	.311**	.019	.255**	.163*	.125	.036	.248**
Erection concern thoughts	.071	.071	.073	.074	.144*	.103	.016
Total	.152*	.053	.189*	.159*	.115	.031	.169*

Note: * $p < .05$; ** $p < .01$.

of the instrument was verified with good to excellent ICCs, indicating that the SMQ is highly reproducible over a four-week gap (Browne & Cudeck, 1992). The strong correlations between the SMQ domain scores and the SDBQ scores indicated an adequate convergent validity.

The original male version from the SMQ (Nobre & Pinto-Gouveia, 2003) encompasses five dimensions: failure anticipation thoughts, erection concern thoughts, age and body-related thoughts, negative thoughts toward sex, and lack of erotic thoughts. In the current study, the exploratory factor analysis using PCA identified a three-factor solution, explaining 51% of the total variance for the male version: Failure Anticipation Thoughts (e.g. "I'm not satisfying her"; "If I fail again I'm a lost cause"); Lack of Erotic Thoughts (e.g. "I'm the happiest man on earth"; "These movements and positions are fabulous"); and Erection Concern Thoughts (e.g. "I must achieve an erection"; "I must be able to have intercourse") The items in the original SMQ concerned with Negative Thoughts Toward Sex and Age and Body Function-Related Thoughts were, in the Iranian SMQ, included in the Failure Anticipation Thoughts. In the context of Islam, religious sources emphasize on the role of husbands in nurturing their wives sexually and mention the husband who satisfies his wife is devout in his obedience to Allah's will (Nekoonam, 2005). Therefore, cultural context demonstrates that Iranian men are less focused on negative thoughts and attitudes towards sexuality, and less centered in their age and body function, compared to their sexual and erection performance.

With regard to construct validity, the results of PCA resulted in a satisfactory six-factor solution for the female sample, explaining 51.2% of the total variance. Findings from the female sample were consistent with the original female version of the SMQ (Nobre & Pinto-Gouveia, 2003). The six factors found were: Failure and Disengagement Thoughts (e.g. "I'm not getting turned on"); Low self-body image thoughts (e.g. "I'm not as physically attractive as I used to be"); Sexual Abuse Thoughts (e.g. "He is violating me"; "He is abusing me"); Sexual Passivity and Control (e.g. "I should not take the lead in sexual activity"; "I must not show that I'm interested"); Lack of Erotic Thoughts (e.g. "These movements and positions are fabulous"; "Making love is wonderful"); and Partner's lack of Affection (e.g. "If only he'd whisper something romantic in my ear"; "Why doesn't he kiss me?"). Overall, the dimensions found were consistent with the factors identified in the original version. Nevertheless, some differences were found in the Failure and Disengagement Thoughts factor, which could be explained due to cultural, social and religious specificities of the Iranian population. According to previous research, the concept of sexual obedience within marriage is regarded as symbolic of an idealized Muslim femininity and as a religious duty in Iran society (Merghati Khoei et al., 2008). Therefore, even if a woman does not have sexual desire/interest or never reach orgasm during sex, she has to be always sexually prepared for her husband and endure sex which may lead to more failure and disengagement thoughts. Sexuality is a historical, social, and cultural construction influenced by the socio-cultural context (Weeks, 1985) and cultural values have a large impact on individual's expectations on sexual relationship (Raisi, Parsa Yekta, Ebadi, & Shahvari, 2015). Therefore, cultural factors have a strong influence on sexual thoughts and might lead people to respond differently to sexual-related issues.

The main findings for automatic thoughts, ERs and sexual arousal in this study support the integrative nature of cognitive, emotional and behavioral components in a sexual context. Overall, for both men and women, negative automatic thoughts during sexual

activity were associated with more negative emotions and fewer positive emotions, and with lower self-perceived subjective sexual arousal. This is consistent with previous studies (Nobre, 2013; Nobre & Pinto-Gouveia, 2003).

The study had some limitations. First, the sample was not randomly selected from the population, and therefore doubts remain as to the extent that the results can be generalized to the Iranian population as a whole. Moreover, they may not be generalizable to the population of Iranians attending clinics. Indeed, a study examining the factorial structure of the SMQ with a clinical sample is clearly needed. Second, divergent validity and known-groups validity was not assessed in this research. For that reason, further studies should be conducted in order to replicate current findings and extend understanding of the psychometric properties of the SMQ.

Regardless of these limitations, main findings suggested that both Male and Female Iranian Version of the SMQ revealed adequate psychometric properties and newly developed Iranian version of the SMQ. It is anticipated that this measure will allow those working in this area in Iran to assess cognitive-emotional dimensions associated with SR during sexual activity. Further studies should be conducted to improve scientific knowledge, in order to develop target clinical interventions, accounting for cultural and social specificities associated with Iranian culture.

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Disclosure statement

The authors declare that they have no conflicts of interest.

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