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Review Article

The effects of psychological interventions on sexual function of women: A systematic review and meta-analysis

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ABSTRACT

Background & Aim: Despite expand using psychological interventions, there is no obvious evidence about the effects of them on sexual function. The study aimed to determine the effect of psychological interventions based on different approaches to the sexual function of women.

Methods & Materials: Pubmed, ISI, SCOPUS, EMBASE, Cochrane reviews, Science direct, SID, and Magiran were searched up to May 2019. Eligible studies were randomized controlled trials in which the effect of psychological interventions on the sexual function of women was assessed using the Female Sexual Function Index without any limitations based on age, ethnicity, language, and nationality. Two of the authors screened the titles/abstracts and obtained all full text of the candidate studies, independently. The quality of studies was assessed using the Cochrane checklist risk of bias. Meta-analysis performed via standardized mean differences with a random-effects model using Review Manager Software (RevMan) version 5.3.

Results: Twenty-one studies with 1460 participants were included. The most effective psychological intervention was individual and group type (SMD=3.82; 95% CI, 2.56, 5.08; P<0.001) with cognitive approach (SMD=2.50; 95% CI, 1.06, 3.95; P<0.001), especially in women with no specific condition (SMD=2.17; 95% CI, 1.20-3.15; P<0.001). The effect of psychological interventions on sexual function increased from 1.48 in one month to 2.30 and 3.78 in two and three months after the intervention; however, it decreased to 1.43 in six months or more follows ups (all Ps<0.001). There was a significant change in all FSFI domains (all Ps<0.01).

Conclusion: Based on the results, individual and group psychological interventions using the cognitive approach and multidimensional therapies with long term follow-ups are suggested for the treatment of sexual dysfunction.

Introduction

Sexual function has a positive relationship with physical, social, and functional dimensions of quality of life (1). According to new version of the Diagnostic and Statistical Manual of Mental Disorder (DSM-V), Sexual dysfunctions (SD) in women include female orgasmic disorder, female sexual interest/arousal disorder and, genito-pelvic pain/penetration disorder (2) Although sexual dysfunction is common worldwide (3), it varies largely in different cross-cultural groups. For instance, in 2016 published studies, it is 55.55% in Indian fertile females (4), 52.5% in Turkish (5), 27% in Hong Kong (6), and 51.2% in Britain (7). Also, sexual dysfunction is more prevalent in women with some diseases, like various types of cancers (60%), especially gynecological cancers (78.44%) (8) and resistant hypertension (72%) (9). There are different options for the treatment of sexual dysfunction in women including Biomedical

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Treatment and Psychosocial Treatment (10). Psychological interventions do not have negative physical side effects and they increase sexual function and satisfaction besides the reduction of symptoms, despite pharmacological treatment options. There are different psychological interventions for the treatment of sexual dysfunction including sexual skills training, sex therapy, cognitive-behavioral therapy, marital therapy, systematic desensitization, educational intervention, and other psychotherapy (11).

Several studies have assessed the effects of psychological interventions on sexual outcomes using different psychological approaches, different study populations, and different outcome evaluations. In a systematic review, Günzler and Berner (2012) studied the efficacy of psychosocial interventions on the frequency of sexual activity and satisfaction of sexual function (12). In another meta-analysis, Frühauf et al. (2013) examined the efficacy of psychological interventions on symptom severity of hypoactive sexual desire disorder, orgasmic disorder, and sexual satisfaction of women (11). Also, based on a meta-analysis, Mindfulness-based therapy (MBT) could be an effective treatment for the sexual dysfunction of women (13). Despite various psychological interventions in different studies; it's not clear which one is more effective on sexual function. Moreover, meta-analysis has not been performed on women's sexual function, which more objectively measures the status of disorders and more exactly measures the function based on its domains. A systematic review and meta-analysis on the effect of psychological interventions on sexual function of women can provide a guideline for health care providers, offering the best psychological intervention approach based on existing evidence, to increase patient's sexual function and their consequent quality of life. As psychological interventions have different natures, it's better to be categorized in different approaches to be assessed in more detail and accuracy. Therefore, this study was conducted to determine the efficacy of psychological interventions based on different approaches versus a control or waitlist group on the sexual function of women in randomized controlled trials (RCT).

Methods

Search strategy

English and Persian electronic databases including Pubmed, ISI, SCOPUS, EMBASE, Cochrane reviews, SID, and Magiran were searched from originated date till May 2019. The search terms were "Girls", "Girl", "Woman", "Women's Groups", "Women Groups", "Women's Group", "Counseling, Sex", "Counselings, Sex", "Sex Counselings", and "Randomized Controlled Trial". In Pubmed, the syntax was as follows [(#Counseling, Sex OR #Counselings, Sex OR #Sex Counselings) AND (#Girl OR #Woman OR #Women's Groups OR #Women Groups OR #Women's Group) AND (#Randomized Controlled Trial)]. In other databases, the appropriate syntax with the abovementioned search terms was used. All reference lists of included studies were assessed and relevant and eligible ones were included in the meta-analysis.

Study selection

The eligibility criteria were defined as The Cochrane PICOs abbreviation that points to population, intervention, comparison, outcome, and study design. It can be beneficial to confirm that all key

elements are correct before beginning the review process (14). In this study, PICOs means P (women), I (all psychological interventions consist of educational interventions, cognitive therapy, and others), C (control or a waitlist group), and O (the sexual function of women), and s (RCT). There was no keyword on the sexual function that was the outcome of this study in the Mesh of the PubMed.

Therefore, this added as an inclusion criterion that studies that used uniformly scale across the world entered to the study. Since there are many scales for assessing sexual function with different definitions, concepts, and sub-scales, the Female Sexual Function Index (FSFI) was selected to obtain a homogenous definition for the meta-analysis. FSFI has six sub-scales including desire, arousal, lubrication, orgasm, satisfaction, and pain. The studies entered the meta-analysis without pay attention to how much of the sub-scales were reported. Studies that were not RCT or not relevant to the main subject were excluded. In terms of age, ethnicity, language, and nationality, there was no limitation. The eligible trials in the Korean language were translated and included in the meta-analysis.

Data extraction

Two of the authors (ME and MM) searched and screened the titles and abstracts for relevancy, obtained the full text of the candidate studies, and extracted data, independently. In cases of disagreement on inclusion or exclusion of an article, consensus or discussions were used. The two authors had an agreement in 99% of the cases and the Kappa coefficient for reliability was 86.5%. The authors of the studies were contacted as necessary. Extracted data from the studies included author (year), country, study quality, counseling type (group and/or individual), counseling approach (educational interventions, cognitive therapy, and others), population, mean age, the sample size in each of intervention and control groups, sexual function mean and standard deviation in different study phases, and reported domains of sexual function.

Sub-group analysis

Sub-group analysis of sexual function and its domains according to the FSFI scale was performed based on the time of outcome evaluation, type of psychological interventions, psychological interventions approach, study population, and quality of the studies. These analyses were performed to decrease heterogeneity and to determine the effects of psychological interventions on sexual function according to different study sub-groups.

Quality assessment

Quality of the studies was assessed using five items of the Cochrane checklist risk of bias for assessing RCTs quality which includes: random sequence generation, allocation concealment, blinding, incomplete outcome data, and selective reporting (15). Each item scores from 0 to 2 based on the authors' judgment as high risk, unclear, or low risk. If the studies fulfilled all criteria, they were classified as high quality, if they fulfilled eight to nine scores, they were classified as moderate quality, and if they did not fulfill more than two criteria (less than 8 scores), they were classified as low quality. No study was excluded based on quality.

Data analyses

The Review Manager Software (RevMan) version 5.3, was used for the meta-analysis. Means and standard deviations of sexual function and its domains were extracted from eligible studies and meta-analysis conducted using standardized mean differences (SMDs) with a random-effects model. The size of SMDs was measured using Cohen's rules as up to 0.2 'small effect', 0.2 to 0.8 'moderate effect', and 0.8 or more 'large effect' (16). The heterogeneity of the studies was assessed using the I^2 statistic (17). Publication bias assessed using a funnel plot. Moreover, subgroup analysis was done to decrease the heterogeneity between the studies. Review Board or Ethics Committee approval and informed consent were not needed.

Results

Study selection

With the search, 5272 references were found (from 1988-2019), which included 5166 through English databases, 47 through Persian databases, and 59 through reference lists. Of the 5272 retrieved references, 508 were excluded because of duplication, and 4743 were excluded because of other reasons. The main reasons for excluding articles from systematic review and meta-analysis were: the studies were not relevant to the main subject (4295); the studies were not RCT (324), full texts were not available (22), and repetitive publications (11). Of 112 remained articles for full-text assessment, 91 ones excluded because of using different outcome evaluation tools (64), lack of required data (18), and lack of control or waitlist group (9) (Figure 1).

Study characteristics

Finally, 21 studies met the inclusion criteria for meta-analysis (Table 1) (18-38). Most of the studies were conducted on women in Iran (76.4%); two in Korea (9.5%); and one in Australia (4.7%); United States (4.7%); and Turkey (4.7%).

The total number of participants in the 21 included studies was 1460, including 725 participants with a mean age of 35.38 in the intervention group, and 735 participants with a mean age of 35.47 in the control group. These 21 studies assessed the outcome (sexual function) at different time intervals; out of them, 16 assessed it immediately or one month after the intervention, thus were included in all the sub-group analyses. While, the remaining studies (five studies) did not have this follow-up assessment, and were only included in the time sub-group analysis.

Five of the studies reported outcome two months after the intervention, three of them reported three months, and two of them reported six months or more after the intervention. Most of the studies used individual types of psychological interventions and two used both individual and group psychological intervention types. Thirteen studies used the educational interventions such as PLISSIT (Permission, Limited Information, Specific Suggestions, Intensive Therapy), PRECEDE (Predisposing, Reinforcing, Enabling, Constructs in Educational Diagnosis and Evaluation), GATHER (Greet, Ask, Tell, Help, Explain, Return), and Bandura's self-efficacy theory, four used cognitive therapy, and four used other approaches.

Most of the studies were conducted on patients; seven were on women with no specific condition and five of them on pregnant or parturient women. The study reporting quality in most of the cases was moderate; it was high in five studies and low in seven studies (Table 1).

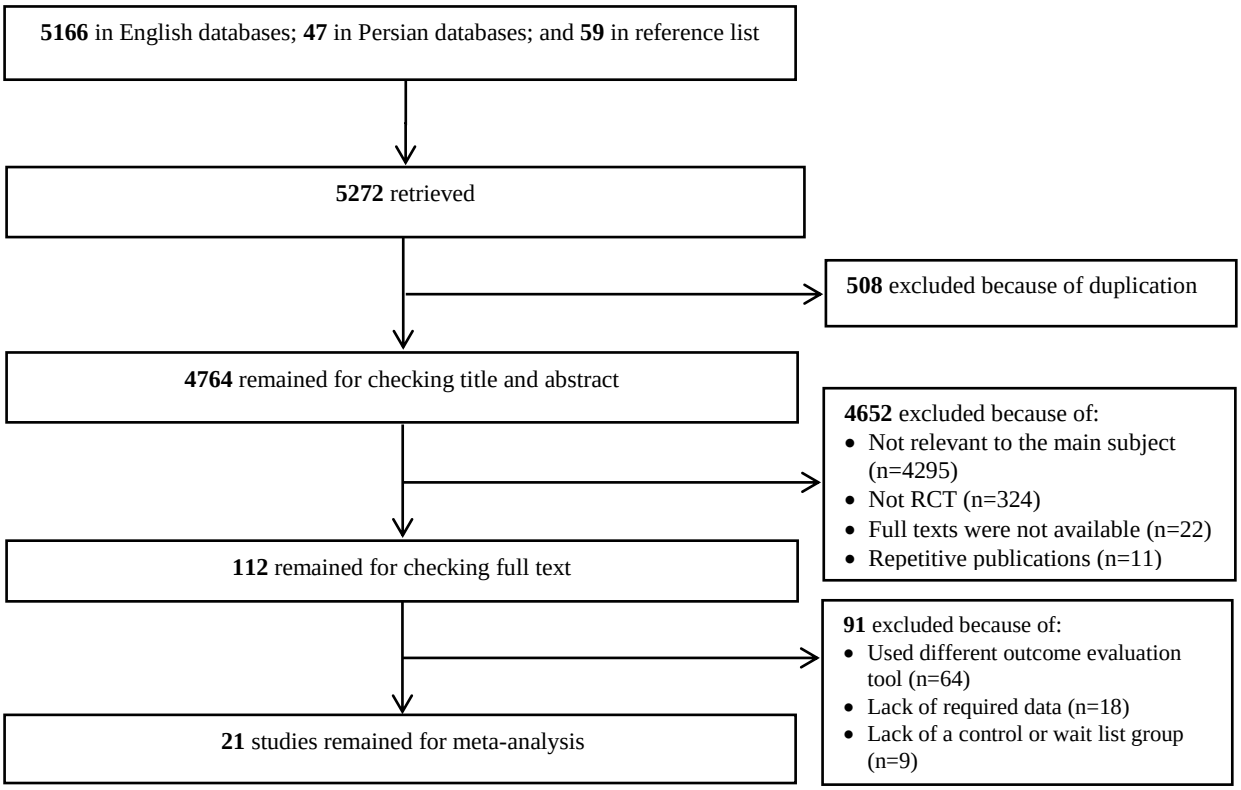

Figure 1. Flow diagram showing the phases of development through the meta-analysis

Table 1. Characteristics of the included studies

Author	Country	Quality	Counseling type	Counseling approach	Population	Mean Age		Sample size		Sexual function Mean (SD)				Reported domains of sexual function
										Baseline		1-month follow-up		
						Control	Intervention	Control (735)	Intervention (725)	Control	Intervention	Control	Intervention	
Afshar (2012)	Iran	High	Group	Others	Pregnant or parturient women	26.7	26.6	42	41	20.2 (8.4)	22.6 (7.9)	19.6 (8.4)	26.6 (4.3)	Yes
Alimohammadi (2018)	Iran	Moderate	Individual & group	Educational Intervention	Women with no specific condition	NR	NR	46	46	27.6 (5.2)	26.2 (4.2)	NR	NR	Yes
Behboodi Moghadam (2015)	Iran	Moderate	Group	Others	Women with no specific condition	33.2	33.9	45	45	22.0 (3.9)	21.9 (3.6)	NR	NR	Yes
Chun (2011)	Korea	Moderate	Group	Educational Intervention	Patients	47.9	46.7	32	29	18.2 (9.9)	16.0 (9.7)	18.1 (9.7)	22.0 (7.5)	Yes
Faghani (2016)	Iran	Low	Individual	Educational Intervention	Patients	NR	NR	50	50	24.1 (4.7)	26.3 (3.8)	24.2 (4.6)	30 (4.4)	Yes
Fatehi (2019)	Iran	Moderate	Group	Others	Patients	43.8	44.8	49	51	14.5 (9.2)	14.8 (8.1)	NR	NR	Yes

Golbabaei (2019)	Iran	Moderate	Individual	Educational Intervention	Patients	28.7	29.7	33	33	21 (2.3)	20.3 (2.5)	20.6 (2)	24.4 (2.7)	Yes
Hezbiyan (2016)	Iran	Low	Individual	Educational Intervention	Pregnant or parturient women	NR	NR	30	30	28.5 (22.4)	40.0 (14.2)	34.2 (19.4)	67.4 (7.3)	Yes
Hosseini (2016)	Iran	Moderate	Group	Educational Intervention	Patients	48.5	48.1	24	24	20.8 (7.7)	19.7 (6.7)	25.1 (9.5)	36.6 (4.0)	Yes
Jones (2011)	Australia	Low	Individual	Cognitive Therapy	Patients	33.3	34.9	17	11	21.9 (6.5)	19.7 (5.7)	18.6 (8.2)	27.3 (3.9)	Yes
Khakbazan (2016)	Iran	High	Individual	Educational Intervention	Women with no specific condition	35.6	34.7	45	43	22.1 (0.6)	21.1 (0.6)	NR	NR	Yes
Masheb (2009)	USA	High	Individual	Cognitive Therapy	Women with no specific condition	43	43.0	25	25	18.4 (1.7)	15.9 (1.7)	19.5 (1.7)	21.9 (1.7)	No
Moradi (2016)	Iran	Low	Group	Others	Patients	45.7	44.7	56	57	23.1 (2.8)	21.8 (3.7)	22.4 (3.0)	26.5 (3.5)	Yes
Nejati (2017)	Iran	High	Individual	Educational Intervention	Pregnant or parturient women	27.1	26.3	40	40	20.3 (3.6)	19.9 (2.7)	20.7 (3.9)	25.2 (1.8)	Yes
Nho (2013)	Korea	Moderate	Individual	Educational Intervention	Patients	44.0	44.3	22	21	10.7 (7.9)	11.7 (7.9)	9.2 (8.9)	23.1 (6.9)	Yes
Rostamkhani (2012)	Iran	Moderate	Individual	Educational Intervention	Women with no specific condition	23.1	23.7	40	40	24.4 (4.6)	25.3 (4.8)	23.7 (4.4)	29.4 (4.2)	Yes
Rostamkhani (2016)	Iran	Moderate	Individual	Educational Intervention	Pregnant or parturient women	24.9	25.1	30	30	25.1 (4)	24.7 (4.3)	23.7 (5)	28.1 (4.5)	Yes
Soltani (2015)	Iran	Low	Individual & group	Cognitive Therapy	Women with no specific condition	33.1	34.0	15	15	36.0 (4.4)	37.9 (4.7)	39.3 (6.7)	65.2 (6.5)	No
Torkzahrani (2016)	Iran	High	Individual	Educational Intervention	Pregnant or parturient women	23.4	24.9	45	45	20.5 (3.7)	19.3 (4.6)	22.4 (3.8)	27.9 (3.7)	Yes
Tutuncu (2012)	Turkey	Low	Individual	Educational Intervention	Patients	52.0	48.4	35	35	23.2 (5.5)	25.1 (6.3)	NR	NR	Yes
Ziaee (2013)	Iran	Low	Group	Cognitive Therapy	Women with no specific condition	21.6	21.5	14	14	23.2 (2.4)	22.2 (4.0)	22.4 (1.5)	29.4 (1.7)	Yes

Fourteen studies declared the sexual functions including desire, arousal, lubrication, orgasm, satisfaction, and pain immediately or one month after intervention, which were included in the meta-analysis. Two studies did not report FSFI domains (Table 1). The funnel plot showed an asymmetric pattern. So according to this test, the existence of publication bias is unlikely (Figure 2).

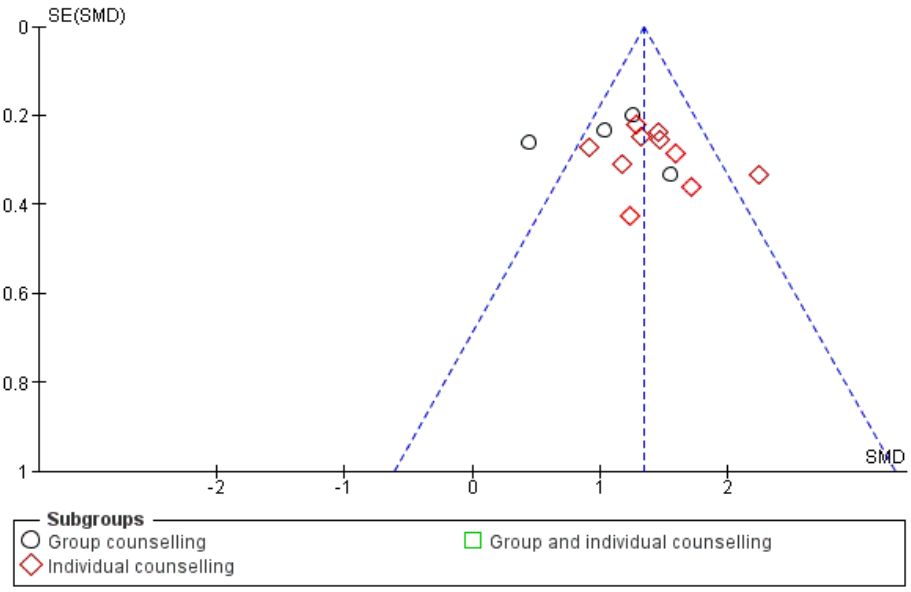

Figure 2. Funnel plot of the published studies

Subgroup analyses

Time of outcome evaluation

The effect of psychological interventions on sexual function was found to be significant between the two intervention and control groups of the trials in which the outcome was evaluated one month or immediately after intervention (SMD= 1.48; 95% CI, 1.20, 1.76; P <0.001), two months (SMD= 2.30; 95% CI, 0.96, 3.65; P <0.001), three months (SMD= 3.78; 95% CI, 0.98, 6.59; P <0.001), and six months or more after intervention (SMD= 1.43; 95% CI, 0.81, 2.04; P <0.001). There was significant overall effect of psychological interventions on sexual function in different times (SMD=1.86; 95% CI, 1.46- 2.25; P<0.001) (Table 2 & Figure 3).

Approach and type of intervention

The different psychological intervention approaches consist of educational intervention, cognitive therapy, and others had significant effect on sexual function [(SMD= 1.37; 95% CI, 1.09, 1.65; P <0.001), (SMD= 2.50; 95% CI, 1.06, 3.95; P<0.001), and (SMD=1.16; 95% CI, 0.86, 1.46; P <0.001), respectively]. Of them, cognitive therapy was the most effective approach. Moreover, the most effective type of intervention was the individual and group type (SMD= 3.82; 95% CI, 2.56, 5.08; P <0.001) (Figure 4).

The study population

The effect of psychological interventions on sexual function of women with no specific condition (SMD= 2.17; 95% CI, 1.20-3.15; P <0.001) was more than in pregnant or parturient women (SMD= 1.39; 95% CI, 0.99, 1.79; P <0.001) and patients (SMD= 1.27; 95% CI, 0.92, 1.62; P <0.001).

Quality assessment

The SMD between the two intervention and control groups in high, moderate, and low quality studies were (SMD= 1.28; 95% CI, 1.04, 1.53; P<0.001), (SMD= 1.22; 95% CI, 0.83, 1.62; P <0.001), and (SMD= 2.12; 95% CI, 1.39, 2.85; P <0.001), respectively (Table 2). The greatest difference between the groups was seen in the low-quality studies.

The sexual function domains

In total, there was significant change in all domains of sexual function including desire (SMD= 1.10; 95% CI, 0.90, 1.30; P<0.001), arousal (SMD= 1.15; 95% CI, 0.96, 1.34; P<0.001), lubrication (SMD=

1.36; 95% CI, 0.90, 1.82; P<0.001), orgasm (SMD= 0.94; 95% CI, 0.67, 1.21; P<0.001), satisfaction (SMD= 0.68; 95% CI, 0.31, 1.05; P<0.001), and pain (SMD= 0.44; 95% CI, 0.15, 0.73; P<0.01). The most significant effect of psychological interventions was seen in lubrication sub-scales and the least was seen in the pain domain. However, some domains in some subgroups were not significant such as the pain domain in many sub-groups (Table 2).

The I^2 statistic in the studies which assessed outcome immediately or one month after the intervention was 74%, so heterogeneity between the studies was high. Sub-group analysis improved heterogeneity in some of them (Table 3).

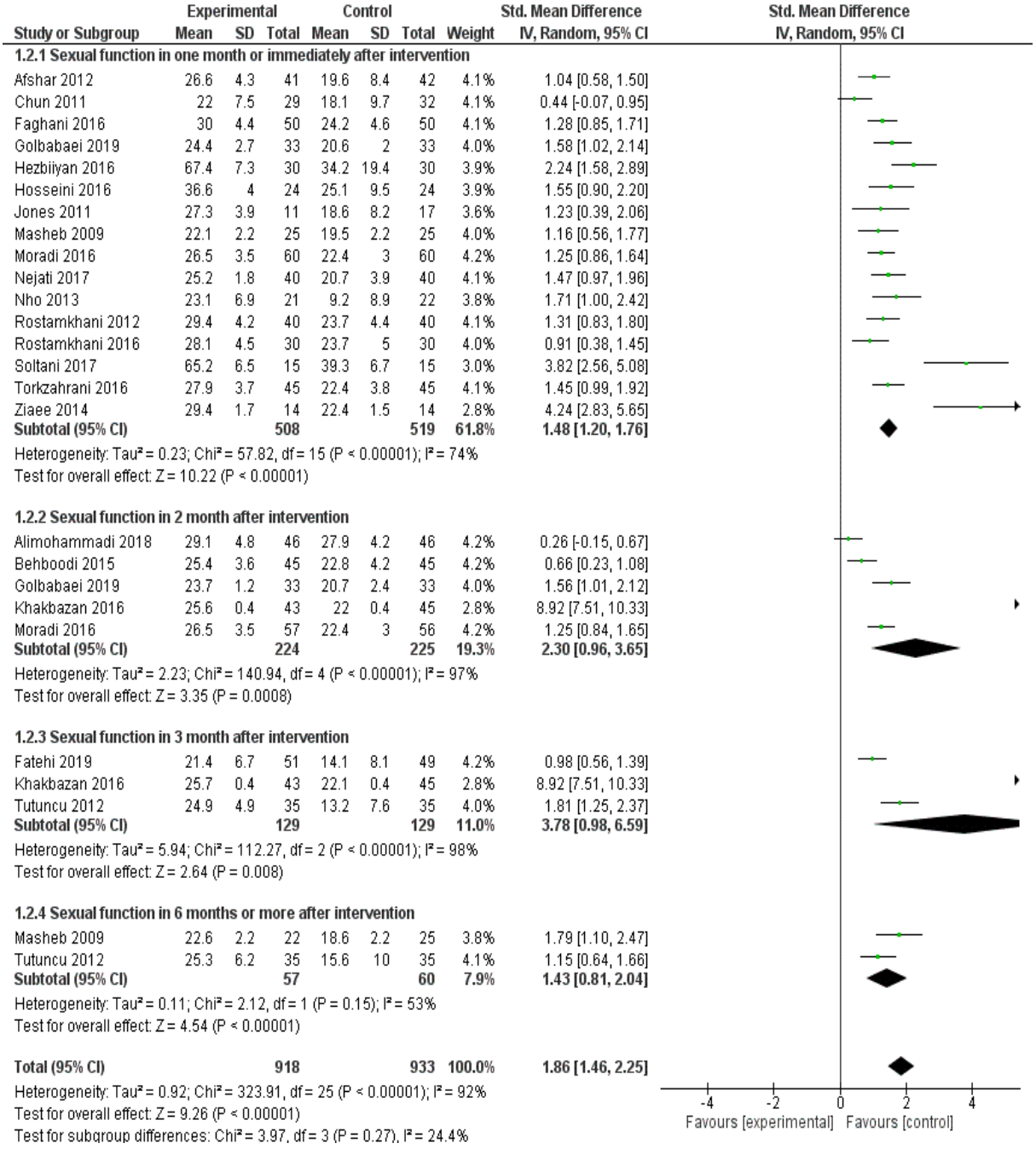

Figure 3. The effects of psychological interventions on sexual function based on the time of outcome evaluation

Table 2. Female Sexual Function Index sub-scale Standardized Mean Difference Scores (95% CI) in different sub-groups of the study

FSFI sub-scales	Desire	Arousal	Lubrication	Orgasm	Satisfaction	Pain
Quality of the studies						
High	1.11 (0.73, 1.50)***	1.06 (0.80, 1.32)***	1.02 (0.76, 1.28)	1.18 (0.91, 1.44)***	0.71 (0.14, 1.28)**	0.62 (0.24, 1.00)**
Moderate	1.07 (0.69, 1.44) ***	1.04 (0.71, 1.36)***	0.88 (0.36, 1.40) ***	0.85 (0.49, 1.22) ***	1.18 (0.79, 1.57) ***	0.41 (-0.20, 1.02)
Low	1.15 (0.79, 1.51)***	1.38 (1.01, 1.75)***	1.10 (0.64, 1.56) **	0.98 (0.35, 1.60) **	1.23 (0.81, 1.66) ***	0.36 (-0.09, 0.81)
Type of counseling						
Group counseling	1.10 (0.60, 1.59) ***	1.25 (0.74, 1.76) ***	0.94 (0.49, 1.38) ***	1.28 (0.65, 1.92) ***	0.46 (-0.01, 0.94)	0.18 (-0.30, 0.67)
Individual counseling	1.15 (0.98, 1.33)***	1.11 (0.94, 1.29)***	1.00 (0.67, 1.34) ***	0.81 (0.54, 1.09) ***	0.82 (0.29, 1.36)**	0.58 (0.20, 0.95) **
The study population						
Women with no specific condition	1.40 (0.61, 2.19) ***	1.39 (0.61, 2.18) ***	1.23 (0.56, 1.90) ***	1.50 (0.10, 2.91) *	1.55 (0.98, 2.12) ***	0.32 (-0.79, 1.44)
Pregnant or parturient Women	1.04 (0.78, 1.31) ***	1.07 (0.85, 1.28) ***	1.04 (0.78, 1.31) ***	0.96 (0.68, 1.25) ***	0.72 (0.36, 1.07)***	0.57 (0.32, 0.83) ***
Patients	1.09 (0.76, 1.42) ***	1.17 (0.83, 1.51) ***	0.83 (0.36, 1.30) ***	0.84 (0.45, 1.22) ***	1.22 (0.86, 1.58) ***	0.27 (-0.37, 0.90)
Counseling approach						
Educational intervention	1.12 (0.90, 1.34) ***	1.08 (0.89, 1.27) ***	0.99 (0.67, 1.32) ***	0.85 (0.58, 1.13) ***	1.01 (0.69, 1.33)***	0.46 (0.11, 0.82) **
Cognitive therapy	1.65 (0.11, 3.20)*	1.67 (0.20, 3.14) *	1.35 (-0.04, 2.75)	2.07 (-0.92, 5.07)	1.93 (1.27, 2.58) ***	-0.05 (-1.68, 1.58)
Others	0.86 (0.58, 1.15) ***	1.23 (0.69, 1.76)***	0.71 (0.43, 0.99) ***	0.90 (0.61, 1.19) ***	1.00 (0.70, 1.29) ***	0.65 (0.36, 0.93)***
Time of the outcome evaluation						
One month or immediately after intervention	1.10 (0.90, 1.30) ***	1.15 (0.96, 1.34)***	0.98 (0.72, 1.24) ***	0.94 (0.67, 1.21) ***	1.09 (0.83, 1.35) ***	0.44 (0.14, 0.73) **
Two months after intervention	2.59 (0.90, 4.27)**	2.66 (1.25, 4.06)***	1.77 (0.07, 3.47)*	2.04 (0.41, 3.67)**	2.04 (0.45, 3.63)**	-0.74 (-2.04, 0.57)
Three months after intervention	4.93 (-0.90, 10.75)	8.92 (7.51, 10.33)***	3.78 (-2.36, 9.92)	3.76 (-2.43, 9.95)	3.02 (-2.68, 8.72)	-0.62 (-3.28, 2.04)
Total effect	1.10 (0.90, 1.30) ***	1.15 (0.96, 1.34) ***	1.36 (0.90, 1.82) ***	0.94 (0.67, 1.21) ***	0.68 (0.31, 1.05) ***	0.44 (0.15, 0.73) **

SMD: Standardized Mean Difference, CI: Confidence Interval *<0.05 **<0.01 ***<0

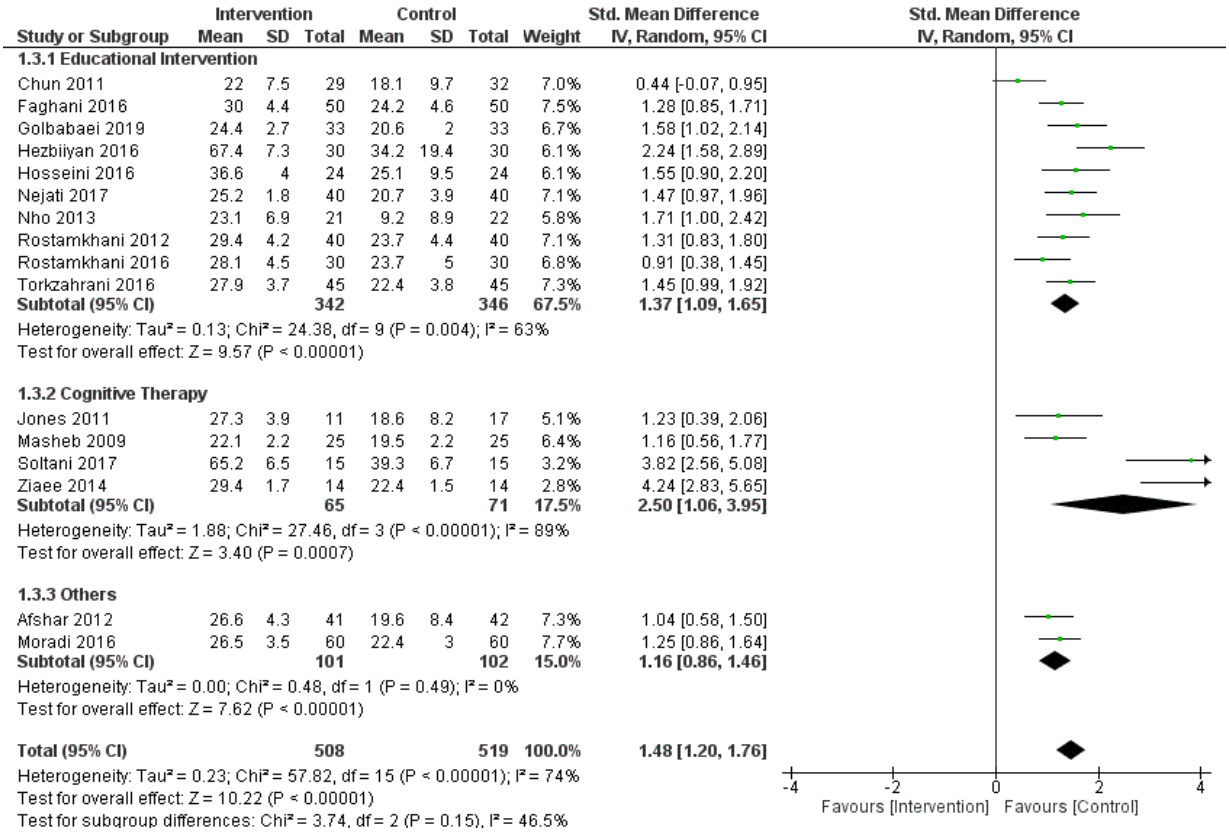

Figure 4: The effects of psychological interventions on sexual function based on the intervention approach

Table 3. Sub-group analysis of the effect of psychological intervention on sexual function using Chi-square test for heterogeneity

Sub-group	Sexual function		P-Value	I^2	P-Value
	SMD	95% CI			
Time of the outcome evaluation					
One month or immediately after the intervention	1.48	1.20, 1.76	< 0.001	74	< 0.001
Two months after the intervention	2.30	0.96, 3.65	< 0.001	97	< 0.001
Three months after the intervention	3.78	0.98, 6.59	< 0.001	98	< 0.001
Six months or more after the intervention	1.43	0.81, 2.04	< 0.001	53	0.15
Type of psychological intervention					
Group	1.44	0.77, 2.12	< 0.001	86	< 0.001
Individual	1.41	1.21, 1.61	< 0.001	24	0.22
Group and Individual	3.82	2.56, 5.08	< 0.001	-	-
Psychological intervention approach					
Educational intervention	1.37	1.09, 1.65	< 0.001	63	0.004
Cognitive therapy	2.50	1.06, 3.95	< 0.001	89	< 0.001
Others	1.16	0.86, 1.46	< 0.001	0	0.49
The study population					
Women with no specific condition	2.17	1.20, 3.15	< 0.001	86	< 0.001
Pregnant or parturient women	1.39	0.99, 1.79	< 0.001	66	0.02
Patients	1.27	0.92, 1.62	< 0.001	63	0.02
Quality of the studies					
High	1.28	1.04, 1.53		0	0.51
Moderate	1.22	0.83, 1.62	< 0.001	66	0.01
Low	2.12	1.39, 2.85		86	< 0.001

SMD: Standardized Mean Difference, CI: Confidence Interval

Discussion

This systematic review and meta-analysis showed that psychological interventions improved the sexual function of women significantly, based on time of outcome evaluation, type and approach of psychological interventions, study population, and quality of the studies. Moreover, there was a significant improvement in all domains of sexual function including desire, arousal, lubrication, orgasm, satisfaction, and pain. The funnel plot showed an asymmetric pattern. So, the existence of publication bias was ruled out.

The effect of psychological interventions on sexual function was significant in trials in which the outcome was evaluated one month or immediately, two, three, and six or more months after the intervention. However, there were only five studies with follow up periods of three and six or more months. Therefore, more studies with a long period of outcome evaluations are suggested. The effect of psychological interventions on sexual function increased in short term follow-ups, but in six months or more follows ups it decreased. Therefore, the authors suggest that psychological intervention effects should be assessed frequently over definite periods and the intervention should be repeated as necessary. As, psychologists insist on independence and autonomy of patients; long or short term interventions should be based on collaboration between counselor and patient, considering personal differences of patients (40, 41).

Based on the type of intervention, individual and group psychological intervention was more effective than each of them alone. It seems that the interventions which integrate the personal needs of each woman with the group dynamic, are more effective. Also, all psychological approaches had a significant effect on sexual function and the most effective approach was cognitive therapy. Sexual function has psychological and interpersonal dimensions (42), which can cause low self-esteem and anxiety. Sexual dysfunction and anxiety have reciprocal effects on each other. Interventions with cognitive therapy approaches can decrease anxiety (43). Psychological factors and cognitive schemas have inevitable effects on the etiology of the emotional distress and problematic behaviors of women with sexual dysfunctions. So, for better sexual function, cognitive therapy approaches over the changes of maladaptive cognitions seem to be more appropriate options (44). However, the couple's sexual history, current sexual behaviors, marital relationship quality, past sexual distresses, and related medical and biological issues should be considered when determining the type of sex therapy (42).

Based on the study population, women with no specific condition were affected more as compared to pregnant or parturient women and patients. Stress, anxiety, depression, and other psychological disorders are more common in pregnant women and patients, which could cause lower sexual function in these populations. Ninivaggio et al. (2017) showed that sexual function reduces as the pregnancy progresses (45). Diseases such as gynecologic cancers and their treatment options can adversely affect sexual function (46, 47). Therefore, it seems that changes in sexual function due to pregnancy, childbirth, or diseases were less affected by psychological intervention approaches. Multidimensional therapies can be helpful in these conditions.

Low-quality studies overestimated the effects. However, there were only five high-quality studies. Less precision in determining inclusion criteria, performing the intervention, random allocation, and follow up in low-quality studies may make them overestimate the effect. Therefore, more precision in these areas is recommended.

The effect of psychological interventions on all domains of sexual function was significant, which was highest in the lubrication domain and lowest in the pain domain. Also, the pain domain was not significant in many of the sub-groups.

Sexual pain is a multifactorial disorder that is affected by physiological and psychological factors (48); therefore, psychological intervention alone cannot relieve it.

Heterogeneity between the included trials was high. This can be due to various follow-up times, population, type, and approaches of psychological interventions, and quality of studies. In this regard, sub-group analysis was conducted based on the aforementioned topics, which decreased heterogeneity in some sub-groups.

There were some limitations which consist of the limited number of high-quality studies, absence of sexual function domains report in some studies, low number of studies from other countries and low number of studies in some sub-groups, and high heterogeneity between the trials. Despite the abovementioned efforts for reduction of the limitations, selection and information biases may exist. Just five studies from other countries met the inclusion criteria and entered to the meta-analysis. One of the reasons that seemed to be contributing to this limitation was the study tool. FSFI has been widely used in Iran in recent years.

Conclusion

This study indicated that psychological interventions were significantly effective on the sexual function of women in all sub-groups, and also in all domains of sexual function. Based on the time of outcome evaluation, there was a reduction in long term effects. Individual and group psychological intervention was more effective than each one alone and the most effective approach was cognitive therapy. Psychological interventions were more beneficial for women with no specific condition. According to these results, the authors suggest long term evaluation of outcomes and repeat intervention as necessary. Moreover, individual and group psychological interventions using the cognitive approach, and multidimensional therapies for pregnant and parturient women, and patients should be considered. The result of this meta-analysis can be useful for health service providers to consider psychological interventions as a method without any negative physical or emotional side effects, for improving the sexual function of women. Moreover, considering all aspects of these kinds of interventions can lead to better health outcomes.

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Conflict of Interest

The authors declare that there are no conflicts of interest in the publication of this study.

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