



Improving body image and sexual life among postpartum women: a single-blind-randomized controlled trial to evaluate a social network-based cognitive-behavioral intervention

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Objective

To determine the effect of a social network-based cognitive-behavioral intervention on postpartum body image and sexual life of primiparous women.

Methods

In this single-blind randomized controlled trial, 82 postpartum women were allocated into two intervention and control groups (allocation ratio, 1:1) using permuted block randomization. Primary outcome was change in body image scores between the groups over time. Secondary outcomes were genital self-image, sexual quality of life, and sexual satisfaction. The intervention group participated in eight (2 weeks) 60-minute sessions through WhatsApp (WhatsApp Inc., Mountain View, CA, USA). Data were collected at recruitment, post-intervention, and 1-month of follow-up.

Results

Cognitive-behavioral intervention had a medium effect on improving body image in postpartum women (partial eta squared, 0.33; $P < 0.001$). The results showed significant differences between the two groups regarding sexual quality of life and sexual satisfaction at 1-month follow-up.

Conclusion

The results of this study can be used to develop psychological interventions targeting body image in postpartum women.

Keywords: Postpartum; Body image; Sexual health; Quality of life; Social media

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Introduction

Body image is an internal representation of an individual's external appearance, including the physical, perceptual, and attitudinal dimensions [1]. Individuals classified as having a negative body image often experience feelings of dissatisfaction with their bodies [2]. This can have consequences such as anxiety, depression, social isolation, weakening of self-concept/self-esteem, and feeling unattractive. Consequently, such individuals are preoccupied with their body's appearance, even to the extent of sexual and social dysfunction [3,4]. Thus, dissatisfaction with body image is considered the primary motive for performing cosmetic procedures [5]. Women are more likely to experience challenges with their body image than men are, mostly due to social expectations, which are often contradictory and confusing [6].

Conversely, we are presently faced with increasing media coverage of celebrities' bodies, which exposes women to unrealistic messages of bodily ideals [7]. Women exposed to these unrealistic messages continuously compare themselves to these ideals, and as a result, perceive their appearance as unfavorable [8,9]. Modern Western society promotes slenderness for both males and females, and the ideal is that females are slim and sharp and males are slender and muscular [8,10,11]. History shows that the factors that determine what is attractive depend on the era, place, culture, and society, and the idea that being slender is the most attractive appearance is a relatively recent phenomenon that appeared in the twentieth century [12].

Due to hormonal changes and body deformation, pregnancy may lead to impaired body image and self-confidence [13]. During pregnancy, a person's body image and concerns about maternal and infant health, especially during the first pregnancy, can cause dissatisfaction with their body image, leading to severe psychological consequences for mothers and children [13,14]. Additionally, pregnancy is characterized by a rapid change in body weight and body size, which occurs within a relatively short period. Such sudden body changes that differ from those before pregnancy may increase dissatisfaction with body image [1]. A prospective study that evaluated maternal body weight and satisfactory changes before pregnancy to 1 month after delivery found that postpartum mothers were heavier than they were before pregnancy, and were less satisfied with their weight and body shape after delivery [5]. Similarly, another longitudinal

study showed that women experienced higher levels of body dissatisfaction in the postpartum period than they did before or during late pregnancy [3]. According to these findings, dissatisfaction with body image during pregnancy is relatively constant [2,4], and it increases during the postpartum period [2,3]. Thus, body image issues and their management have recently been recognized by researchers [15,16].

From a cognitive-behavioral perspective, disturbed body image occurs when a person experiences distortion in the perception, behavior, cognition, and emotion related to weight or body shape [17,18]. Several studies have assessed the effect of cognitive behavior intervention (CBI) on body image impairment [19-21]. However, as different sociocultural contexts largely influence the body image concept, culturally adaptive interventions may provide valuable evidence for mothers' health promotion in different societies [22]. Considering that the use of internet-based resources provide various health care services and increases accessibility, flexibility, efficiency, and satisfaction [23,24], the present study aimed to determine the effect of a social network-based CBI on the body image and sexual life of postpartum women.

Materials and methods

1. Study design

This study was a randomized, single-blind, parallel design controlled trial (allocation ratio, 1,1), in which we applied the Consolidated Standards of Reporting Trials statement.

2. Participants and recruitment

Primiparous women were recruited from public primary healthcare centers affiliated with the Mazandaran University of Medical Sciences, Northern Iran at 3-12 weeks after delivery. Eligible women's names and phone numbers were extracted with assistance of the integrated health record systems in Iranian health care centers. Via telephone-based contact, eligible women were invited to participate voluntarily in the study.

3. Inclusion criteria

The inclusion criteria were educated women with access to the internet and having a smartphone, laptop, or tablet, couples with no addiction to any addictive substances, those who did not use medication that affects sexual function,

those who did not have any mental disorder, and those who were willing to participate in the study.

4. Exclusion criteria

The exclusion criteria were failure to attend more than two intervention sessions, taking psychiatric medication during the intervention, or exposure to unfortunate events, such as losing loved ones during the study.

5. Sample size

According to the study by Rodgers et al. [25], using STATA software, v.13.0 (STATA Corporation, College Station, TX, USA) with a 95% confidence interval [CI]; power, 80%; number of measurement repetitions, 3; medium effect size, 0.5; and attrition rate, 15%; the sample size in each group was calculated as 41 women.

6. Randomization

The participants were divided into two groups: A (intervention, n=41) and B (control, n=41) groups, using the permuted block randomization method. They were blinded to the allocation. Blocks with AABB combinations and all possible modes were first identified in the list. Each block had an exclusive code. Subsequently, according to the sample (N=82) and block (S=4) sizes, 21 blocks were selected using a simple random sampling method. The blocks were stratified into four strata (underweight, normal weight, overweight, and obese) to eliminate the confounding effects of body mass index, and an exclusive code was assigned for each. Finally, numbers from 1 to 82 were written on 82 sealed envelopes, and the names of the groups were placed in the envelopes according to the computer program. The principal investigator opened the envelopes in that order, and women were randomly selected from one of the two intervention or control groups. All these steps were performed under the supervision of a statistician using a random allocation software (version 1.0.0; Saghaee, Isfahan, Iran).

Results

1. Sociodemographic checklist

This included questions pertaining to factors such as age, weight, height, educational level, employment status, type of delivery, number of pregnancies, and history of an underlying

disease.

2. Multidimensional body-self relations questionnaire

This questionnaire consists of 68 items to assess an individual's attitude toward body image. The items included six dimensions: appearance evaluation, appearance orientation, fitness evaluation, fitness orientation, participant weight, and body area satisfaction. It was scored on a 5-point Likert scale, and the total score varied between 68-340. Its validity was evaluated by Brown et al. [26] and reliability was reported to be 0.81. Additionally, a correlation coefficient above 0.75 for all dimensions was obtained in the Iranian context [27].

3. Female genital self-image scale

This 20-item scale includes questions about the genital in terms of color, genital size, small and large lip size, groin color, genital color, amount and manner of hair growth in the genital area, genital loosening and sagging, vaginal tightness, and dilation, and genital function measures the women's genital self-image. The items were scored on a 5-point Likert scale. The total score ranged between 20-100. This questionnaire was designed by Sabbaghan et al. [28] and its validity and reliability had been determined in the Iranian society; its Cronbach's alpha value was reported to be 0.90.

4. Sexual quality of life-female questionnaire

This is an 18-item self-reporting instrument that assesses the impact of sexual dysfunction on women's quality of life. It measures four domains of women's sexual quality of life (psychosexual feelings, sexual satisfaction, self-worthlessness, and sexual repression). The items are scored on a 6-point Likert scale, and the total score varies from 0-90. This questionnaire was first developed in 1998, and then reviewed and validated by Symonds et al. [29] in 2005. Its validity and reliability for Iranian women had been determined by Maasoumi et al. [30] and its internal consistency with a 95% alpha index had been confirmed.

5. Sexual satisfaction scale for women

This 30-item scale comprises five dimensions, including satisfaction, communication, compatibility, relational concern, and personal concern. The items are scored on a 5-point Likert scale, and the total score ranges between 30-150. Its reliability was higher than 0.80 for all dimensions [31], and the Cronbach's alpha coefficient of this scale was more than

0.70 in the Iranian society [32].

6. Intervention group

First, all the women in this group included members of a virtual channel on WhatsApp social media (WhatsApp was chosen because of easier access and its popularity in the Iranian community). All members filled out all measurements at recruitment. The intervention group received social network-based CBI in eight sessions (2 weeks), each lasting 60-minute. The content of the intervention protocol concerned the physical and psychological consequences of childbirth, strengthening self-confidence and self-esteem, and creating positive feelings. It was designed based on the body image workbook of Dr. Cash's 8-step program for learning to like your looks [5] and completed by three Iranian experts (a psychiatrist, clinical psychologist, and reproductive health specialist). Dr. Cash's 8-step model was founded on the relationship between body image, perceptions, and attitudes about themselves, especially physical appearance. According to this model, people focus on perceiving their feelings and thoughts about their body image and how they shape this image. The content of the intervention sessions was provided in form of text, audio, and video files, as presented in Table 1. After each session, the participants were allowed to express their experiences and problems with private messages. The assignments in each session were checked via private messages and provided with feedback before the subsequent session.

7. Control group

All the control groups were included as members on a WhatsApp social media channel. They received eight education sessions, similar to the intervention group in terms of number, route of delivery, and length of sessions on nutrition, exercise, and breastfeeding during postpartum period. To comply with ethical issues, at the end of the study, a brief version of issues about body image was provided to the control group in one session using WhatsApp messenger. Both groups received routine postpartum care from their healthcare providers, which focused on mothers' evaluation of any abnormal signs and symptoms, and education about breastfeeding and birth control. The participants completed the measurements in three stages: recruitment, post-intervention, and 1-month follow-up. The Porsline program (PorsLine, Tehran, Iran) developed the questionnaires online, and a link was sent to the participants (<https://porsline.ir/>).

8. Statistical analysis

Continuous variables were reported as means±standard deviations, and categorical variables were reported as frequencies and percentages. Repeated-measures Analysis of Variance was used to evaluate the mean difference (MD) in the primary outcome between the intervention and control groups, using a Bonferroni *post hoc* test to control for the increased risk of type I error due to multiple comparisons. Independent *t*-tests were also applied to the secondary outcomes. Partial eta squared and Cohen's reported primary and secondary outcomes, respectively. All analyses were performed using

Table 1. The content provided in each session in the intervention group

Session	Content of each session
Session 1	Initially, the goals and rules of the channel were expressed and introduced (audio and text contents). Then, we expressed a short definition of body image, the effects of body image on participant life, and teaching how to discover many aspects of body image by conducting scientific self-examination so that they can set specific goals for change (video contents).
Session 2	In order to start the education program with awareness, detailed information about the factors affecting body image and the pressures of daily life was provided to them (video contents).
Session 3	Providing information about anxiety, body and mind relaxation (audio and video contents).
Session 4	Providing information about, beauty culture, beauty criteria in different countries and cultures, then tried to identifying problematic appearance assumptions (video contents).
Session 5	Modifying private body talk and mental mistakes were corrected by learning and teaching correct comparisons and critical thinking (video contents).
Session 6	Teaching strengthening self-confidence and self-esteem and overcoming self-breaking behaviors (video contents).
Session 7	Teaching some techniques to treating with their body well and take positive action on their body image (video contents).
Session 8	Teaching how to accept them and preserving their positive body image for life (video contents).

SPSS ver. 25 (IBM Corp, Armonk, NY, USA) and STATA software (STATA Corporation, College Station, TX, USA) with a significance level of less than 0.05 and a per-protocol approach.

9. Flow of participants through the trial and recruitment

Eighty-two participants were recruited for this trial between August 2020 and September 2020, followed by November 2020. Finally, 36 women in the control group and 32 in the intervention group completed the study. The flow of participants is shown in Fig. 1, including several recruited participants and reasons for loss to follow-up.

10. Participant characteristics

The participants' mean age in the intervention and control groups was 27.12 ± 4.50 and 26.63 ± 3.99 years. The other sociodemographic characteristics of both groups are shown in Table 2.

11. Primary outcome: body image

As shown in Table 3, there was no significant difference in the body image score between the two groups at baseline (30.74 ± 2.99 vs. 31.15 ± 2.63 , $P=0.357$). But this score statistically increased in the intervention group compared to the control group (39.32 ± 6.05 vs. 34.44 ± 2.95 ; MD, 4.69; 95% CI, 2.49 to 6.88; $P<0.001$) at post-intervention measurement

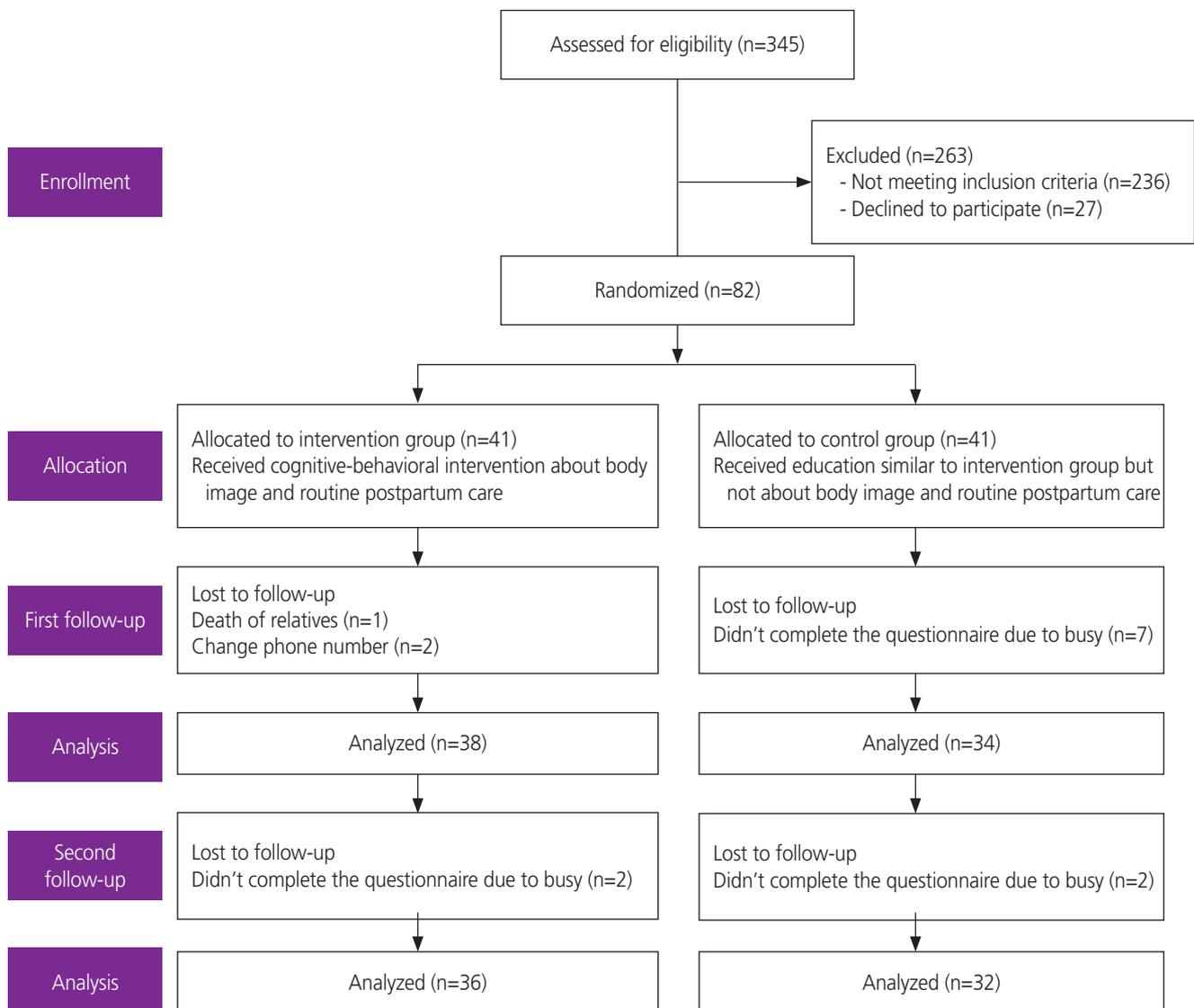


Fig. 1. Consort flow diagram.

Table 2. Women's baseline characteristics in the intervention and the control groups

Variable	Intervention (n=41)	Control (n=41)
Age	27.12±4.50	26.63±3.99
Weeks after childbirth	9.78±3.77	10.10±3.52
BMI	27.09±5.02	27.07±4.28
Education		
Middle & high school	12 (29.26)	10 (24.39)
Collegiate	29 (70.74)	31 (75.61)
Job		
Housewife	37 (90.24)	38 (92.68)
Employed	4 (9.76)	3 (7.32)
Type of delivery		
Normal vaginal delivery	13 (31.70)	14 (34.14)
Caesarean section	28 (68.30)	27 (65.86)

Values are presented as mean±standard deviation or number (%).
BMI, body mass index.

Table 3. Means and standard deviations of body image in the intervention and the control groups

Variable	Intervention	Control	Comparison between groups	P-value
Baseline				
NVD	13 (30.83±2.46)	14 (30.75±2.43)		
C/S	28 (30.68±3.32)	27 (31.29±2.72)	-0.59 (-1.8 to 0.68)	0.357
Total	41 (30.74±2.99)	41 (31.15±2.63)		
Post intervention				
NVD	12 (35.93±4.66)	9 (34.12±2.75)		
C/S	22 (41.35±5.95)	29 (34.55±3.06)	4.69 (2.49 to 6.88)	<0.001
Total	34 (39.32±6.05)	38 (34.44±2.95)		
One-month follow-up				
NVD	12 (40.90±6.84)	9 (33.12±2.89)		
C/S	20 (45.11±4.55)	27 (33.73±2.85)	9.95 (7.78 to 12.12)	<0.001
Total	32 (43.53±5.79)	36 (33.58±2.83)		

Values are presented as number (mean±standard deviation) or mean difference (95% confidence interval).
NVD, normal vaginal delivery; C/S, cesarean section.

Table 4. Repeated measure analysis to compare body image score in intervention and control group

Source	Sum of squares	df	Mean square	F	P-value	Effect size (partial eta squared)
BMI	75.97	1	75.97	2.68	0.107	0.041
Group	905.72	1	905.72	31.91	<0.001	0.336
Delivery	144.78	1	144.78	5.1	0.027	0.075
Group delivery	57.7	1	57.69	2.03	0.159	0.031

BMI, body mass index.

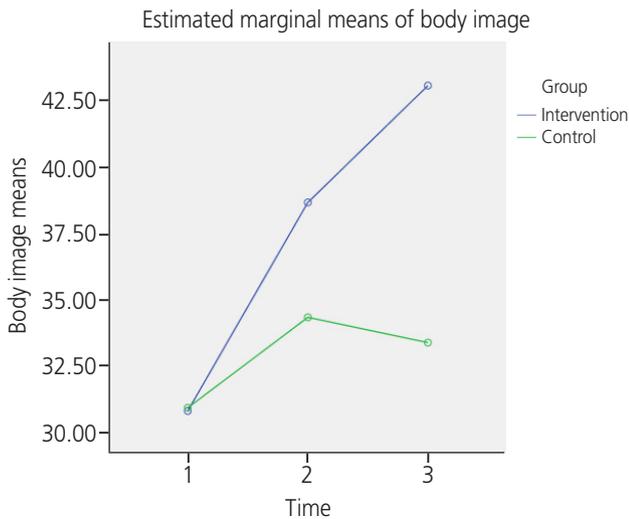


Fig. 2. Body image mean difference score from pre-intervention to 1-month follow-up in the intervention group.

and 1-month follow-up (43.53 ± 5.79 vs. 33.58 ± 2.83 ; MD, 9.95; 95% CI, 7.78 to 12.12; $P < 0.001$).

The results of repeated-measures analysis (Table 4, Fig. 2) indicated that by considering covariates, such as type of delivery and body mass index, CBI is a significant effective intervention for postpartum body image of primiparous women (partial eta squared, 0.33; $P < 0.001$). Bonferroni post hoc test showed that the body image score increased in the intervention group from pre- to post-intervention (MD, -5.79; $P < 0.001$), from pre- to 1-month follow-up (MD, -8.65; $P < 0.001$), and from post-intervention to 1-month follow-up (MD, -2.86; $P = 0.006$).

12. Secondary outcomes: sexual quality of life, sexual satisfaction, and genital self-image

Table 5 compares the mean scores of the secondary out-

Table 5. Means, standard deviations, effect sizes, 95% CIs for secondary outcomes in the intervention and the control groups

Variable	Intervention	Control	P-value	Effect size	95% CI	
					Lower bound	Upper bound
Sexual quality of life						
Baseline						
NV	13 (88.92±10.94)	13 (92.77±20.23)				
C/S	28 (88.03±14.64)	28 (90.00±16.91)	0.46	-	-	-
Total	41 (88.31±13.45)	41 (90.88±17.82)				
Post intervention						
NV	12 (92.50±13.82)	10 (91.70±20.36)				
C/S	22 (97.27±10.34)	28 (87.71±15.68)	0.052	0.465	-0.004	0.933
Total	34 (95.59±11.70)	38 (88.76±16.84)				
1-month follow-up						
NV	12 (95.83±14.47)	9 (90.00±22.35)				
C/S	20 (103.85±4.47)	27 (85.85±16.70)	<0.001	0.94	0.434	1.43
Total	32 (100.84±10.11)	36 (86.89±18.02)				
Sexual satisfaction						
Baseline						
NV	13 (112.08±20.79)	13 (116.85±24.32)				
C/S	28 (108.21±17.23)	28 (114.36±25.03)	0.236	-	-	-
Total	41 (109.44±18.26)	41 (115.15±24.53)				
Post intervention						
NV	12 (116.33±24.34)	10 (113.60±22.08)				
C/S	22 (125.00±14.41)	28 (111.32±22.98)	0.048	0.479	0.008	0.946
Total	34 (121.94±18.64)	38 (111.92±22.98)				

Table 5. Means, standard deviations, effect sizes, 95% CIs for secondary outcomes in the intervention and the control groups (Continued)

Variable	Intervention	Control	P-value	Effect size	95% CI	
					Lower bound	Upper bound
1-month follow-up						
NV	12 (120.92±21.81)	9 (106.11±31.87)				
C/S	20 (138.00±5.48)	27 (107.00±27.64)	<0.001	1.03	0.52	1.53
Total	32 (131.59±16.06)	36 (106.78±28.29)				
Genital self-image						
Baseline						
NV	13 (74.61±6.13)	13 (76.31±7.34)				
C/S	28 (74.03±8.73)	28 (74.57±9.73)	0.631	-	-	-
Total	41 (74.22±8.99)	41 (75.12±7.26)				
Post intervention						
NV	12 (75.25±6.22)	10 (77.80±10.47)				
C/S	22 (76.09±7.89)	28 (73.96±9.51)	0.69	0.09	-0.36	0.55
Total	34 (75.79±7.26)	38 (74.97±9.78)				
1-month follow-up						
NV	12 (76.83±6.23)	9 (74.89±8.55)				
C/S	20 (77.70±7.08)	27 (74.37±9.93)	0.158	0.34	-0.13	0.82
Total	32 (77.37±6.69)	36 (74.50±9.49)				

Values are presented as number (mean±standard deviation).

CI, confidence interval; NV, normal vaginal; C/S, cesarean section.

comes between the two groups before, after, and 1 month after the intervention. There were considerable differences between the two groups in terms of sexual quality of life (effect size, 0.9; $P < 0.001$) and sexual satisfaction (effect size, 1; $P < 0.001$) in a 1-month follow-up, although this difference was not observed in genital self-image.

Discussion

Recently, social standards of beauty emphasize the desire to lose weight or absolute beauty in women, which may interfere with their body image and encourage unnecessary cosmetic surgeries. Therefore, well-designed psychological trials may provide evidence regarding the efficacy of these interventions on body dissatisfaction in postpartum women. In line with other studies [25,33,34], the considerable impact of CBI on women's body image in the present study indicates that providing psychologically informed sessions is likely to affect women themselves through increased confidence

and decreased distortions in women's perception, cognition, and behavior. Through systematic desensitization and exposure techniques, CBI predisposes individuals to create opportunities to enjoy their appearance, all of which affect their body image. However, CBI's failure to impact body image [35] presents the continuing challenges of preventing body dissatisfaction. Similar to previous studies [34,36-38], our study showed that an internet-based intervention may have a significant effect on women's body image and their sexual-related issues. As CBI is one of the most researched activities in internet-delivered interventions [39], the finding of this project is a valuable result for distance intervention in societies with limited access to health professionals or in social distancing circumstances, such as global pandemics. This relatively new research approach could be a cost-effective alternative for face-to-face psychotherapy, although some research questions remain open, including how internet interventions can be blended with traditional forms of care.

It is noteworthy that despite all the remarkable effects of this intervention, a lack of significant difference was ob-

served in terms of genital self-image scores before and immediately after the intervention and at 1-month of follow-up, which was inconsistent with Berman and Windecker's study [40]. They examined the effects of genital self-image on sexual function. Samples were randomly selected among 2,206 women of different races, marital statuses, and ages. Their results indicated that a high genital self-image score was associated with sexual function in women. Women with high genital self-image scores also had higher sexual function scores. The reason for this can be attributed to differences in educational content, manners of implementing the intervention, as well as differing cultures and their resulting changes. This finding was in line with the study by Sabbaghan et al. [28], which may be due to the similarity of the cultures and research instruments included.

Generally, social network-based CBI had non-ignorable effects on the sexual quality of life and sexual satisfaction of the individuals in a 1-month follow-up. Studies have shown that those with a negative body image are more likely to abstain from sexual activity [41]. Several aspects of body image, including weight concern, sexual unattractiveness, and thoughts about the body during intercourse, are responsible for this sexual activity [18]. Conversely, having a positive body image is associated with a good sexual life; therefore, improving the sexual life of postpartum women by increasing their body image score is anticipated.

1. Limitations

The participants' self-reports might not have accurately reflected their sexual problems due to shame or confidentiality; therefore, the results may be prone to reporting bias. However, the researcher provided the necessary explanations regarding the confidentiality of the data. The results of this study can be cautiously generalized to uneducated non-primiparous women. Further, instances of miscommunication might have occurred during the intervention sessions through WhatsApp messenger and by collecting data over Porsline, which is relatively inevitable in internet-delivery interventions. Notably, a 1-month follow-up period was a fairly short follow-up period after the intervention. To understand whether these effects are sustained over a longer period, a long-term follow-up periods should be considered in future research.

2. Conclusion

Social network-based CBI can improve the body image of postpartum women. This study has implications for integrating psychological interventions into routine postpartum care. Future research areas are highlighted, including the need for culturally adaptive protocols in different socioeconomic societies, exploring other social networking methods, and integrating network-based studies and face-to-face interventions.

Conflict of interest

The authors declare that they have no conflict of interest.

Ethical approval

The Ethics Committee of Mazandaran University of Medical Sciences (MAZUMS) approved this study (Code: IR.MAZUMS.REC.1399.507). Also, it registered in the Iranian Registry of Clinical Trials with reference code: IRCT20150608022609N9. The study's objectives were explained to the participants, and they were ensured that their data would remain confidential. Informed consent was obtained from them in line with the Declaration of Helsinki. As this study was a virtual intervention, to obtain informed consent, the first section of the online questionnaires was allocated to the willingness and satisfaction to participate in the study, and it was necessary to answer this section to answer the rest of the questions.

Patient consent

Informed consent was obtained from all individual participants included in the study.

Funding information

This project was approved by Mazandaran University of Medical Sciences, Sari, Iran (n=7,834). This has no role in the design of the study and collection, analysis, and interpretation of data.

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on request.

Authors' contributions

All authors made a substantial contribution to writing of the paper draft and met the four criteria for authorship recommended by the International Committee of Medical Journal Editors.

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