

The effect of pelvic floor muscle exercises program on sexual self-efficacy in primiparous women after delivery

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ABSTRACT

Background: Selection and acceptance of appropriate sexual behavior and sexual function are made difficult by low sexual self-efficacy in the postpartum period. The general purpose of this research is to define the effects of an 8-week pelvic floor muscle exercise program on sexual self-efficacy in primiparous women after childbirth.

Materials and Methods: This clinical trial was performed on 79 primiparous women who referred to health care centers, Mashhad, Iran in 2013, 8 weeks after delivery, to receive health care services. They were selected by easy sampling. The samples were randomly assigned to either intervention or control group. The intervention group was trained in Kegel exercises for 8 weeks. Both groups were evaluated at 4 and 8 weeks. Data collection tools included: Demographic information, sexual self-efficacy, and Brink scale. Data were analyzed using repeated measures, Friedman test, *t*-test, and Mann-Whitney test.

Results: The results showed significant increase in pelvic floor muscle strength in the intervention group at 4 and 8 weeks after exercises ($P < 0.0001$), but no significant difference was observed in the control group ($P = 0.368$). There was a significant increase in sexual self-efficacy in the intervention ($P < 0.0001$) and control groups ($P = 0.001$) at 4 and 8 weeks after the start of the study. Comparison of the two groups showed a significant difference in sexual self-efficacy after they performed these exercises ($P = 0.001$).

Conclusions: The findings showed that 8-week pelvic muscle exercises increase the sexual self-efficacy in women after delivery.

Key words: Exercises, Iran, pelvic floor, postpartum, self-efficacy, sexual

INTRODUCTION

The sex life of individuals has changed over time due to events, and pregnancy and childbirth and the postpartum period are the events that influence the sexual behaviors and interactions.^[1,2] Postpartum period changes the women's sexual relationships in such a way that sometimes these changes are followed by significant problems in the couples' relationships.^[3]

Delivery affects the women's body organs, especially the genital tract, and these changes may cause problems in women's sexual relationships.^[4]

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About 90% of women begin sexual activity after 6 weeks of childbirth. Of this total, 83% experience sexual problems in the first 3 months and 64% in the first 6 months after delivery.^[4,5] Elif *et al.* reported that 91.3% of women experience at least one sexual problem in the postpartum period.^[5] Ahmadi shirvani (2011) also reported that about half of the women (41.4%) had some degree of sexual problems within 1 year after delivery.^[6]

Several factors have been reported, such as maternal duties, sleep disorders, psychosocial changes, fatigue, changes in mental imaging of the body, and breastfeeding, to reduce the sexual function after delivery.^[4,6] Among them, reduced strength of pelvic floor muscle after delivery is the main cause that negatively affects women's sexual function.^[7] Therefore, sexual problems after childbirth are mostly observed in women who have had vaginal delivery.^[4]

Loss of pelvic muscle strength is one of the physical changes in the postpartum period and even many years after that, leading to complications such as pelvic pain, urinary incontinence, cystocele, rectocele, and lack of sexual satisfaction.^[8]

Most people who work in relation to the treatment of sexual problems have observed that in the evaluation of sexual problems and determining its nature, sexual self-efficacy as an intervening variable has a determining role.^[9] Merghati

Khoii *et al.*'s study showed that women's sexual self-efficacy reduces after delivery. Low sexual self-efficacy and no confidence in their capabilities in sexual activity after delivery create troubles in the selection and acceptance of proper sexual behaviors and sexual function.^[1]

Sexual self-efficacy is one of the aspects of self-efficacy which refers to the individuals' beliefs in their abilities to perform sexual acts and sexual emotional reactions successfully.^[10] Sexual self-efficacy is a main and invisible variable in individuals' sexual function.^[9] In various studies, it is mentioned as an important factor for a healthy and satisfying sexual relationship in such a way that high sexual self-efficacy is followed by more sexual compatibility and more sexual activity.^[9,11,12] Elke and Hannah, in their study, stated that increased sexual self-efficacy may be a strategy to prevent sexual problems in young women.^[13]

Although social and psychological factors play an important role in women's sexual problems, the role of physical factors such as vascular, neurological, and muscular factors in women's sexual function is undeniable.^[7,14] Pelvic floor muscles play an important role in the stimulation and orgasm in women.^[11,15] Therefore, weakness of these muscles causes decreased blood flow, decreased vaginal sensation, dyspareunia, and anorgasmia.^[7,16] Pelvic floor muscle relaxation has been identified as an affecting factor on sexual satisfaction. Half of the women with pelvic organ prolapse suffer from sexual dysfunctions such as; decreased libido, orgasmic disorder, problems in sexual arousal, dyspareunia and sexual dissatisfaction.^[17-19] On the other hand, reports show that the rate of cesarean delivery is increasing.^[20] Today, some women prefer cesarean delivery to vaginal delivery to prevent damage to the pelvic floor and decrease in sexual function.^[21,22]

Several treatments have been reported for pelvic floor muscle relaxation, but none of them is without complications.^[23] The Kegel exercise is free, painless, and has no side effects; also, it can be done at any time of the day.^[14] Available data indicate that more than 200 million women around the world are not familiar with these exercises and are not aware of their effects. Furthermore, 50% of women do not perform this exercise correctly.^[23]

Adeniyi *et al.*'s study^[24] and LeCheminant *et al.*'s study^[25] showed that there is a significant relationship between self-efficacy and performing exercises in the postpartum period. Modarres *et al.* reported that Kegel exercises increase sexual satisfaction of women.^[14] Also, Lara *et al.* reported that Kegel exercises are effective in increasing the strength of pelvic muscle, but do not improve sexual satisfaction.^[26] Baytura *et al.* reported no significant relationship between

pelvic floor muscle strength and sexual function in women after childbirth.^[8]

Since there are limited studies about the effects of these exercises on sexual self-efficacy, especially after delivery, we performed this study in Mashhad in 2013 with the aim to evaluate the effect of pelvic floor muscle strengthening exercise program on sexual self-efficacy in nulliparous women in the postpartum period.

MATERIALS AND METHODS

This clinical trial was performed on 79 nulliparous women who referred to the medical-health centers of Mashhad in 2013. To determine the sample size, the formula of comparison of the mean was used. Sampling was done in several stages. The names of the five main medical-health centers were written on a paper and each was put in an envelope, and then an envelope was randomly selected. Thus, among the five medical-health centers in Mashhad, center No. 1 was randomly selected.

Then, from medical-health center No. 1, nine covered centers were selected by lottery and the required sample size was determined according to the number of referrals for receiving postpartum care and vaccination in each center. Easy sampling was performed among nulliparous women who referred to health centers 8 weeks after child birth to receive health care services. After selecting the participants, they were randomly assigned to either intervention or control group.

Inclusion criteria were: Being nulliparous, Iranians living in Mashhad, having the ability to read and write, living with husband, beginning the sexual activity after delivery, having passed 8 weeks of vaginal delivery, having a healthy baby, no postpartum complications, lack of special medical disease, lack of psychological disorder in couples, non-addictive couples, not using alcohol or drugs affecting sexual function, no uterine prolapse or cystocele or rectocele grade 3 and 4, and not having undergone stressful event during a month ago. Exclusion criteria included being pregnant during the study, doing regular exercises during the study, and not regularly performing Kegel exercise program based on the method proposed in the study.

After obtaining informed consent, the intervention group was given face-to-face training about the anatomy and function of the pelvic floor muscles and how to do Kegel exercises. A pamphlet and an audio CD about how to do Kegel exercises were presented to this group.

Pelvic floor muscle strength was measured with Brink scale. This scale is a four-degree (1, 2, 3, 4) tool which is measured based on three criteria: Pressure, moving the fingers in the horizontal plane, and time. The minimum score is 3 and the maximum score is 12. If after the intervention, the scores obtained by this criterion are increased, it shows an increase in pelvic floor muscle strength. To determine the strength of the pelvic floor muscles by Brink scale, the sample was asked to lie down on the bed in supine position with knees bent and focus on the perineal area and completely relax the perineal area. Then two fingers were put inside the vagina, and she was asked to contract her pelvic floor muscles just like when she holds the urine and she had to try to pull the researcher's finger upward and inward.^[27]

In the intervention group, after identifying these muscles, the subjects were asked to contract the pelvic floor muscles during examination of the vagina, and then after ensuring proper contraction of the muscle, they were asked to do these exercises twice daily, each time 15–20 times depending on their ability to contract their pelvic floor muscles for 5–10 s and relax for 5–10 s and repeating this exercise for 20 times (for 5 min). After 2 min of rest, they again had to perform this exercise for 3 times of 5 min. so that a total of 20 minutes of exercise is performed at each time.^[28]

Checklist includes the duration of exercise per day and performing exercise according to training program. It were taken from subjects at the end every 4 weeks. The researcher performed the follow-up of the subjects by telephone every 2 weeks in order to find out if they were regularly performing the exercises and had other problems. Pelvic floor muscle strength and sexual self-efficacy were examined again at weeks 12 and 16 after delivery and then the results were compared [Figure 1].

Data collection tool in this study included an interview form consisting of four sections: Personal-familial information, marital and sexual relationships, pregnancy and infant, and Brink scale; and Bailes sexual self-efficacy questionnaire (1989) which consists of eight dimensions (desire, sensuality, arousal, orgasm, emotion, communication, body acceptance, and rejection). If the subject is able to do the activity, her confidence is determined to be in the range of 10 (very uncertain) to 100 (absolutely certain), and if she is not able to perform that, the column is left blank and in this case, zero score is given. The overall score of the questionnaire is obtained from the mean of all dimensions of sexual self-efficacy. Higher score indicates higher sexual self-efficacy.

The validity of demographic characteristics form was confirmed by content validity method and its reliability was confirmed by the method of evaluators' agreement with a correlation coefficient of $r = 0.83$. The validity of sexual self-efficacy questionnaire in Iran was confirmed by Mreghati Khoii *et al.*^[1] Its reliability was confirmed by Bailes *et al.* (1989) through test-retest ($P < 0.001$, $r = 0.83$) and internal consistency (Cronbach's alpha 0.93) and by Mreghati Khoii *et al.* through internal consistency coefficient (Cronbach's alpha 0.87).^[1,10] The validity of Brink scale has been confirmed by Borello-France *et al.* in California.^[29] In Iran, it has also been used and confirmed by Golmakani *et al.* to measure pelvic floor muscle strength.^[30] To determine its reliability, a pelvic examination was performed on 10 subjects, and the correlation coefficient was calculated by the researcher and the researcher-aid through equivalent reliability and the reliability of the test was determined ($P < 0.01$, $r = 0.74$).

Data were analyzed using SPSS software (version 16, Team EQX), and with descriptive statistical tests and the tests of repeated measures, Friedman, *t*-test, and Mann-Whitney. The results were considered significant at $P < 0.05$. This study was approved by the Ethics Committee of Mashhad University of Medical Sciences (code 911064). Clinical trial registration code is N1-2013062313750.

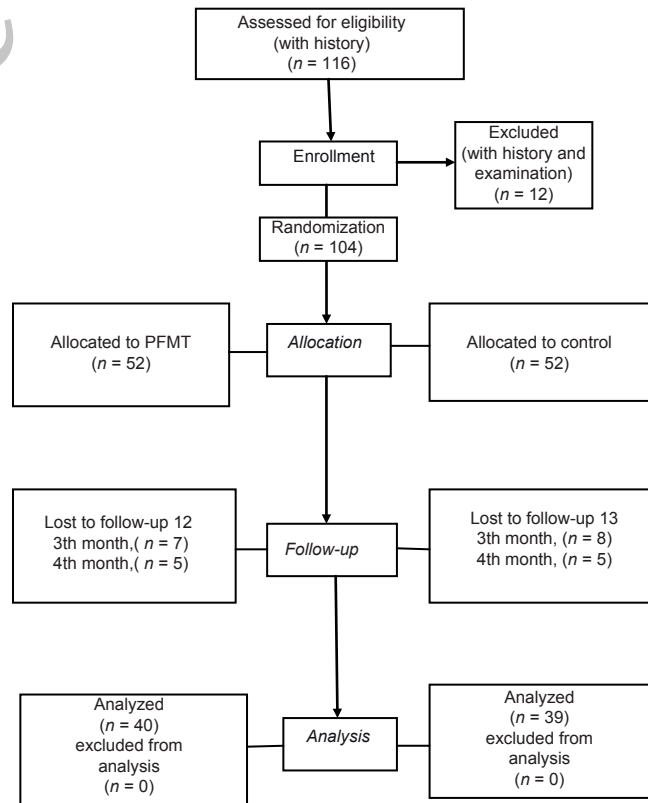


Figure 1: Flow diagram of participants of the study pelvic floor muscle training and control groups

RESULTS

In this study, 104 patients were enrolled and 25 patients were excluded (11 cases due to not referring and lack of willingness to continue in the study, 8 cases due to failure to perform the exercise program according to the study, 5 cases due to immigration, and 1 case due to severe postpartum bleeding). Finally, 79 subjects were analyzed in this study.

The two groups were matched for age, age of husband, wife's and husband's education, occupation, income level, residency status, length of marriage, body mass index, pelvic floor muscle strength, gestational age at delivery, birth weight of infant, wanted pregnancy pregnancy, a ruptured perineum or episiotomy, the complications of perineal laceration repair, contraception method, feeding of the infant, postpartum onset of sexual intercourse, frequency of intercourse in the week after delivery, history of sexual training, and marital satisfaction status [Table 1].

Forty-one cases (78.8%) in the intervention group and 42 (80.8%) in the control group were employed, and 27 (51.9%) in the intervention group and 23 (44.2%) in the control group had college education. Forty cases (76.9%) in the intervention group and 33 (63.5%) in the control group had an income level enough for living. The contraception method used in 21 cases (40.4%) of the intervention group was condom and in 18 (34.6%) of the control group was interrupted intercourse. Fifty cases (96.2%) in the intervention group and 45 (86.5%) in the control group had no history of sexual training.

Mann-Whitney test results in the intervention and control group showed that there was statistically significant difference between the two groups in terms of mean strength of pelvic floor muscle 8 weeks after beginning of the study ($P < 0.0001$) [Table 2].

Comparison of mean sexual self-efficacy at three time stages in each group indicated that the mean of sexual self-efficacy was significantly increased in the intervention and control groups 4 and 8 weeks after the beginning of the study compared to before the study ($P = 0.001$) [Table 3].

According to the *t*-test results, in the intervention group, the mean score of all aspects of sexual self-efficacy was significantly increased 8 weeks after the study compared to baseline: Desire ($P < 0.0001$), sensuality ($P = 0.002$), arousal ($P < 0.0001$), orgasm ($P < 0.0001$), emotions ($P < 0.0001$), communication ($P < 0.0001$), body

Table 1: Mean and standard deviation of individual and fertility characteristics in both intervention and control groups

Variables	Mean (SD)		P value
	Control group	Intervention group	
Woman's age (years)	25.19 (3.78)	26.57 (3.92)	0.868*
Husband's age (years)	30.28 (4.54)	30.38 (5.21)	0.862*
BMI (kg/m ²)	24.17 (2.90)	24.64 (3.14)	0.431*
Marriage duration (years)	3.55 (1.78)	4.21 (2.13)	0.125**
Gestational age (weeks)	39.0 (1.43)	38.75 (2.0)	0.843**
Onset of sexual intercourse after delivery	42.26 (8.24)	42.13 (10.22)	0.655**
Birth weight (g)	3210.57 (388.98)	3130.8 (631.41)	0.974**

*Independent *t*-test, **Mann-Whitney test, SD: Standard deviation, BMI: Body mass index

Table 2: Comparison of mean scores of the pelvic floor muscles before, 4 and 8 weeks after the start of the study in the intervention and control groups

Scores of the pelvic floor muscles	Mean (SD)		P value* (inter-groups comparison)
	Control group	Intervention group	
Before the study	6.84 (1.24)	6.87 (1.04)	0.246
4 weeks after the study	7.00 (1.30)	7.14 (0.92)	0.793
8 weeks after the study	7.06 (1.25)	10.15 (1.02)	<0.0001
P value** (inter-groups comparison)	0.368	<0.0001	

*Mann-Whitney test, **Friedman test, SD: Standard deviation

Table 3: Comparison of sexual self-efficacy scores before and 4 and 8 weeks after the start of the study and control groups

Sexual self-efficacy scores	Mean (SD)		P value* (inter-groups comparison)
	Control group	Intervention group	
Before the study	50.62 (12.3)	49.08 (11.74)	0.291
4 weeks after the study	50.82 (12.61)	51.68 (11.14)	0.804
8 weeks after the study	52.28 (13.18)	62.78 (12.16)	0.001
P value** (inter-groups comparison)	0.001	<0.0001	

*Independent *t*-test, ** repeated measures test, SD: Standard deviation

acceptance ($P < 0.0001$), and refusing sex ($P < 0.0001$). In the control group, only sexual desire ($P = 0.01$) showed significant differences 8 weeks after the study compared to baseline.

Also, based on the results of the *t*-test, the two groups had statistically significant difference at the end of the study in terms of sexual desire ($P = 0.001$), arousal ($P = 0.001$), orgasm ($P < 0.0001$), and body acceptance ($P = 0.001$).

DISCUSSION

Based on the results of this study, pelvic floor muscle strength was significantly increased in the intervention group 4 and

8 weeks after beginning of the study. In the study of Adel *et al.* that aimed to evaluate the effect of pelvic floor muscle strengthening exercises after vaginal delivery on sexual function in women, pelvic floor muscle strength in women was significantly increased in the intervention group,^[16] which is consistent with the finding of this study. Kegel exercise strengthens levator ani muscle through muscular hypertrophy and stronger levator ani muscle improves support and reduces the burden imposed on the ligament. Performing these exercises leads to revascularization of damaged cells and tissues.^[31,32]

Morkved and Kar also reported that pelvic floor muscle strength increases after 8 weeks of performing the postpartum Kegel exercises.^[33] In the study, the pelvic floor muscle strength also increased in the control group, which is inconsistent with result of the present study. It seems that the disagreement with the results of this study could be due to differences in measuring the strength of pelvic floor muscles and the study population (nulliparous and multiparous women, vaginal delivery and cesarean delivery). In the present study, control group also received postpartum care instructions that included Kegel exercises and 50% of them reported that they performed these exercises once or twice a week. Therefore, it could account for the increase in pelvic floor muscle strength in the control group.

The studies indicated self-efficacy as one of the most important predictors of physical activity.^[34-36] The researchers have found in some sub-groups of patients and healthy population that people with higher self-efficacy are more likely to engage in physical activity,^[37-39] and the interventions that rely on promoting self-efficacy have been successful in increasing individuals' physical activity.^[40,41] LeCheminant *et al.*, in a study to evaluate the effect of endurance exercise on women's self-efficacy, reported that doing these exercises increases the self-efficacy of women in the postpartum period.^[25]

Modarres *et al.* evaluated the effects of Kegel exercises on sexual satisfaction of 100 nulliparous women. The results showed that the score of sexual satisfaction in women was increased after doing the exercises.^[14] Citak *et al.* stated that although these exercises have a positive effect on women's sexual function, they do not increase the rate of women's sexual satisfaction.^[7] Probably the cause of difference with the present study is due to the differences in Kegel exercise protocols and tools used in the study.

The exercises strengthening pelvic floor muscles increase women's ability to achieve optimum orgasm, duration and intensity of orgasm, number of orgasms, and

vaginal sensation during sexual intercourse.^[42] Therefore, improvement of women's sexual self-efficacy after doing pelvic floor strengthening exercises is justified in this study.

In the control group, women's sexual self-efficacy was significantly increased 8 weeks after the beginning of the study compared to baseline; this increase was less than that found in the intervention group. Postpartum period is followed by factors such as fatigue, anxiety from changes in life, and care of the newborn baby. These factors have a negative impact on women's sexual life.^[7] Over time, these concerns had diminished and the mother is also more compatible with the existing status, it would be justification for the increase in sexual self-efficacy found in the control group.

Given that pregnancy and childbirth are the predisposing factors for weakening of the pelvic floor muscles and Kegel exercise is the best way to strengthen pelvic floor muscles,^[43] it is recommended that due to the positive effect of pelvic floor strengthening exercises on the women's sexual self-efficacy, Kegel exercises should be considered as clinical and counseling services by midwives in postpartum care.

One of the limitations of this study is that the study was performed in a particular community (nulliparous women with vaginal delivery), which reduces the generalization of the study to a larger community. Cultural issues such as modesty and shame of discussing about sexual issues could have affected the answers given by the studied women, but the researcher tried to create a friendly environment and decrease this limitation partially.

CONCLUSION

Regarding the effect of pelvic floor strengthening exercises to increase women's sexual self-efficacy, the findings of this study could lead health planners and managers to pay more attention to provide training of Kegel exercises to women in the postpartum period. This research could be a step toward training and encouraging women to do Kegel exercises during pregnancy, in order to prevent and reduce problems caused by pelvic floor muscle relaxation after vaginal delivery and to improve the women's sexual self-efficacy.

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