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Effects of a Postpartum Back Pain Relief Program for Korean Women

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Purpose. Despite the high prevalence of back pain and its subsequent effects in post-partum women, intervention programs are scarce. The purpose of this study was to test the effects of a back-pain-reducing program on post-partum women who experienced low-back pain during pregnancy.

Methods. A non-equivalent control-group pretest-posttest design was used. Pregnant women who attended a hospital for prenatal check-ups and experienced back pain participated in an intervention program (n=27), and the results were compared with women in a control group from another hospital (n=25).

Results. At 8 weeks post-partum, the pain intensity, functional limitations were lower in the intervention group than in the control group. However, differences in mean change of the pain intensity and functional limitations between 36 and 39 weeks of gestation and at 8 weeks post-partum were not statistically significant between the groups. Moreover, the flexibility, post-partum functional status, and post-partum depression did not differ significantly between the groups.

Conclusions. A back-pain-relief program in this study was not effective to reduce the back-pain intensity in post-partum women and to decrease the associated functional limitations. The implications for nursing practice and directions for future research are discussed.

Key Words : Back pain; Functional limitations; Post-partum; Intervention

INTRODUCTION

Even though back pain is experienced by more than half of all pregnant women at some time during pregnancy (Borg-Stein, Dugan, & Gruber, 2005; Kristiansson, Svärdsudd, & von Schoutltz, 1996; Nilsson-Wikmar, Harms-Ringdahl, Pilo, & Pahlback, 1999), it is not considered an important health problem. Many pregnant women consider back pain to be a normal part of pregnancy and expect it to spontaneously disappear after delivery, and hence tend not to seek help from health care professionals (Moon et al., 2000; Östgaard, Zetherström, & Roos-Hansson, 1997).

However, back pain in pregnancy is a substantial problem because it can persist into the post-partum period and thereby influence the post-partum recovery (Nilsson-Wikmar, Holm, Oijerstedt, & Harms-Ringdahl, 2005; Östgaard et al., 1997; Padua et al., 2005). Low-back pain reportedly occurs in 30-45% of women during the post-partum period (To & Wong, 2003). According to Padua et al. (2005), around half of women who experience back pain during pregnancy still complain of back-pain symptoms at 1 year after delivery.

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Moreover, women who experience back pain during pregnancy have an increased risk of back pain in a subsequent pregnancy (Brynhildsen, Hansson, Persson, & Hammar, 1998; Nilsson-Wikmar et al., 1999; Östgaard & Anderson, 1991).

Intervention programs during pregnancy employ exercises, physiotherapy, education on ergonomics, water gymnastics, and the use of a pelvic girdle. However, despite the high prevalence of back pain and its subsequent effects during the post-partum period, intervention programs are scarce. Only a few studies have evaluated intervention programs for women with post-partum back pain, with the studies of Mens, Snijders, and Stam (2000) and Stuge, Lacrum, Kirkesola, and Vollestad (2004) producing conflicting results. Stuge et al. (2004) compared individualized physical therapies with and without specific stabilizing exercises in women with post-partum pelvic girdle pain, and found that the inclusion of these exercises reduced the pain and improved the functional status. In contrast, Mens et al. (2000) found that varying the level of exercises of the diagonal trunk muscle systems for women with persistent pelvic pain after pregnancy had no effect on the results. This suggests uncertainty about an optimal approach.

Moreover, no reported study has investigated the effects of post-partum exercise on reducing back pain in Korean women. Post-partum care in Korea differs in many ways from that in Western countries. Traditional post-partum care in Korea emphasizes rest as the means to post-partum recovery, with exercise considered a physical stressor (Kim-Godwin, 2003; Schneiderman, 1996). The purpose of this study was therefore to identify the effects of a back-pain-reducing program applied to post-partum Korean women who experienced low-back pain during pregnancy. The effects of the program on post-partum back-pain intensity, functional limitations, flexibility, post-partum functional status, and post-partum depression were examined. This study hypothesizes that participants in intervention group will have lower back pain, fewer functional limitations, higher flexibility, higher postpartum functional status, and lower postpartum depression than those of control group at 8weeks after delivery.

METHODS

Subjects and setting

A non-equivalent control-group pretest-posttest design was used in this study. An overview of the study design and measurement is given below (see Figure 1).

Subjects were recruited from two obstetric and gynecologic (Ob-Gy) hospitals in G city, Korea. To avoid cross-contamination of information from the intervention to the control group, the subjects in the two groups

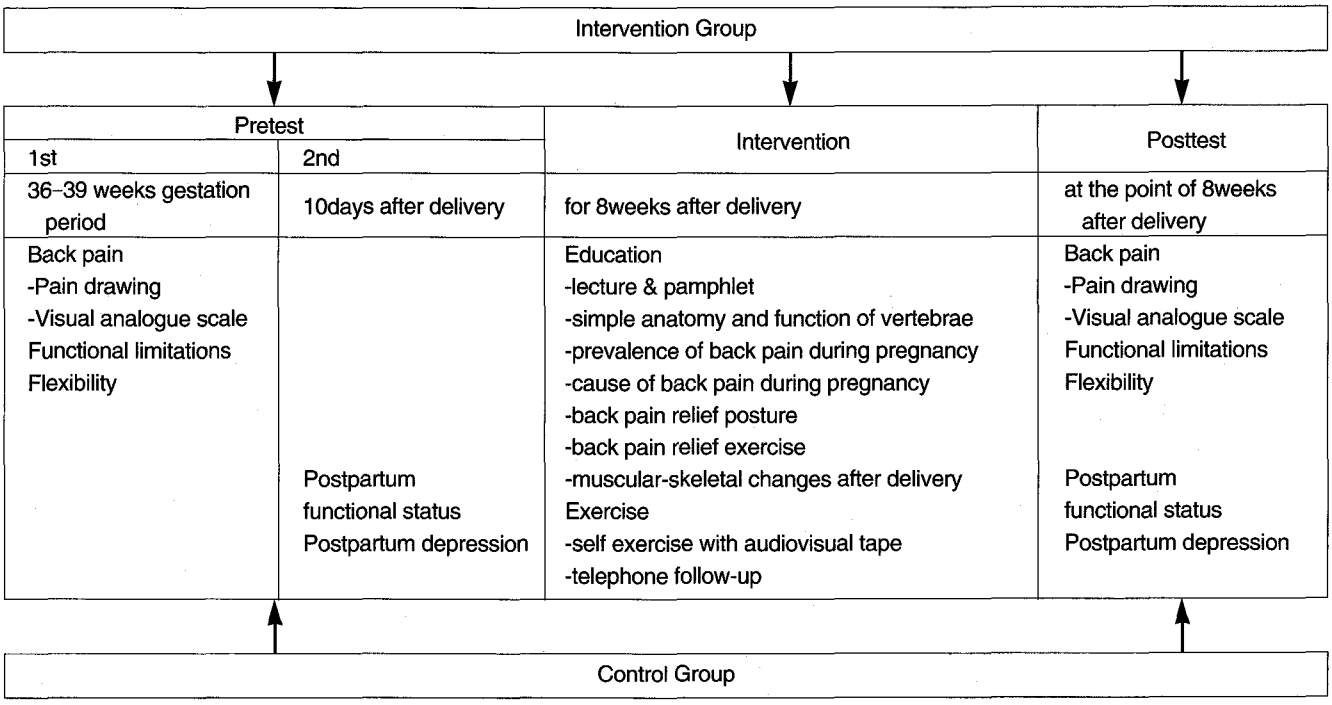

Figure 1. Overview of the study

were recruited from different hospitals. The subjects were pregnant women who regularly attended a local Ob-Gy hospital for prenatal check-ups, and were recruited according to the order in which they visited the Ob-Gy hospital. The subjects in this study participated by volunteering after they received information about this program from the staff of the local Ob-Gy hospital that they attended.

Subjects who met the following criteria were included in this study: (a) women between 36 and 39 weeks of gestation period, (b) agreeing to participate to this study, (c) aged between 20 and 35 years, and (d) reporting low-back pain during pregnancy. Subjects were excluded if they had any medical or surgical complications during pregnancy, delivery, or the post-partum period.

Data were collected between May, 2002 and October, 2002. Among a total of 69 subjects recruited (37 in the intervention group and 32 in the control group), 52 subjects (27 in the intervention group and 25 in the control group) completed questionnaires at all three time points, indicating an attrition rate of 24.6%. Two subjects in the intervention group did not complete pretest 2 (10 days post-partum) due to premature delivery or complications in the newborn, and 8 subjects did not complete the posttest due to a failure to continue exercise, loss of contact, or personal reasons. Two subjects in the control group did not complete pretest 2 due to personal reasons, and 5 subjects did not complete the posttest due to loss of contact or personal reasons. The attrition rates were 27.03% and 21.88% in the intervention and control groups, respectively.

Description of the intervention

The back-pain-relief program was developed by the first author based on a literature review and consultation with a panel of experts consisting of two professors in maternity nursing and an orthopedic surgeon. The back-pain-relief program consisted of a standardized education protocol: pamphlet, lecture, audio-visual tape describing the exercise, daily exercise record, and telephone calls. The intervention program was implemented by the first author. A 40-minute class was given at 35 to 39 weeks of gestation, which included instruction on simple anatomy, posture physiology, lifting and working techniques, muscle training, and relaxation training. This class was held at the education room in the Ob-Gy hospital. At this time, all participants in the intervention group received instruction on how to perform back-pain-reducing and muscle-strengthening exercises, and were asked to perform these exercises at home. One to three subjects participated in each education lecture, and a total of 19 repeat lectures from May 18, 2002 to July 6, 2002 were held by the first author to recruit all participants in the intervention group.

The pamphlet was given to all participants in the education class. The audio-visual tape that was specially designed for this study based on Williams' Flexion exercise program (Heckman, 1984) and the exercise of Moon and Choi (2001) for reducing back pain by strengthening and stretching lumbar vertebrae and abdominal muscle during pregnancy was distributed to women in the intervention group. This 20-minute audio-visual tape consists of 6 sets of self exercise to relieve back pain including pelvic tilting, knee pulling, straight leg raising, curling up, lateral straight-leg raising, and the Kegel exercise.

Women in the intervention group were encouraged to perform this exercise 3 sessions a day, and 3 to 5 days a week from the day attended education class to 8weeks after delivery. It took 30 minutes to finish all motions in a session. They were asked to fill their daily exercise on the distributed daily exercise record. Women in the intervention group were telephoned once or twice per week by the first author to provide encouragement, reinforce regular exercise, assess back pain, and provide counseling on their own post-partum and infant care. The back-pain-relief program was administered only to the intervention group.

Procedures

The data were collected at three time points: between 36 and 39 weeks gestation (pretest 1), at 10 days post-partum (pretest 2), and at 8 weeks post-partum (posttest). Time points for data collection were decided based on the literature review and judgements of the panel of experts. Previous studies noted the highest prevalence of back pain after 36 weeks of pregnancy and a considerable drop out shortly after delivery (Östgaard & Andersson, 1992; To & Wong, 2003). Moreover, mostly 6–12 weeks interventions were applied to check short-term effect of pregnancy related back pain reduction interventions (Stuge, Hilde, & Vollestad, 2003) and 8-week length of the intervention were applied under the consideration of drop-out rate.

Variables measured at the pretests and the posttest are listed in Figure 1. Pretest 1 was conducted in education rooms at the Ob-Gy hospitals, and pretest 2 and the

posttest were conducted either in these rooms or at the subject's home by the first author. Upon completion of the questionnaire, the participant received a gift (a waterproof bed-sheet cover) to compensate them for their assistance.

Instruments

A structured self-administered questionnaire was used to measure general and obstetric characteristics, back-pain-related characteristics, and outcome variables.

Back pain

In this study, the term "back pain" included lumbar back pain, posterior pelvic pain, and mixtures of the two. The presence and distribution of pain were measured with the aid of a pain drawing (Sturesson et al., 1997) completed by the subjects. Subjects were asked to localize their pain within areas L1 to L5, including the symphysis region, the groin, the greater trochanter, the region of the sacroiliac joints, and the lateral parts of the buttock. The intensity of the pain was measured by a visual analogue scale (VAS) comprising a 10-cm-long vertical line, where 0 cm indicated no pain and 10 cm indicated that pain as bad as it could not tolerate. Each subject placed a mark through the line in accordance with the perceived intensity of the most intense pain experienced during the previous week. The VAS is considered a convenient, easy, and rapidly administered measurement that is useful to measure subjective pain (Wewers & Lowe, 1990). Its reliability and concurrent validity have been identified (Olaogun, Adedoyin, & Anifaloba, 2003).

Functional limitations

Functional limitations experienced by the subjects were assessed on a 20-item, 3-point Likert scale (1 = no difficulties; 2 = painful but possible; 3 = not possible due to pain) developed by Bergquist-Ullman and Larson (1977). The higher score means the greater functional limitations. Reliability and validity have been identified (Bergquist-Ullman & Larson, 1977; Dumas, Reid, Wolfe, Griffin, & McGrath, 1995). Cronbach's α for the sample in the present study was 0.72.

Flexibility

Flexibility was measured using a digital forward flexmeter (HRS-220, Japan). Subjects were asked to step onto the footstand with heels together and big toes about 5 cm apart, and then to place the arms together and stretch until the finger tips touched the cursor. Then, the body was bent gradually forward without bending knees. The flexibility was measured twice, with the highest score being recorded.

Post-partum functional status

Post-partum functional status was measured by the Inventory of Functional Status after Childbirth (IFSAC) developed by Fawcett and Tulman (1988). The three dimension subscales of the IFSAC are the responsibilities of infant care, household activities, and self-care. The inventory consists of 26 items rated on a 4-point Likert scale (from 1 to 4), with a higher score indicating a higher functional status after childbirth. An evaluation of the IFSAC showed that its content validity, as determined by Popham's average congruency procedure, was 96.7%, and that is internal consistency reliability was 0.89 (Fawcett & Tulman, 1988). Cronbach's α for the sample in the present study was 0.74.

Post-partum depression

Post-partum depression was measured to assess any possible psychological effects of back pain using the Post-partum Depression Scale developed by Bai (1997). This scale is a 46-item, 4-point self-reported scale (from 1 to 4) designed to measure post-partum depression based on physiological and psychological measures, social responses, and the relationship with the infant, where a higher score indicates higher post-partum depression. Bai (1997) reported satisfactorily content and construct validity, and an internal consistency of 0.95. Cronbach's α for the sample in the present study was 0.95.

Ethical considerations

Ethical approval was first obtained from antenatal clinic review boards for the protection of human rights as research subjects. Since participation in the study was voluntary, participating the study was considered as obtaining informed consent for the study. Participants were informed that their decision to participate in the research would not affect their status, and that they could withdraw from the study at any time during the intervention.

Data analysis

Data were analyzed using SPSS/PC 11.0. The follow-

ing analyses were conducted:

1. The x^2-test, Fisher's exact probability test, and t-test were used to compare homogeneity on general characteristics, obstetrical characteristics, and factors related to back pain between the intervention and control groups.
2. t-tests were used to test hypotheses.

RESULTS

The baseline general, obstetric, and back-pain-related characteristics of all of the participants are presented in Table 1, none of which differed significantly between the two groups. The baseline outcome variables of all of the participants are presented in Table 2; these also did not differ significantly between the two groups.

At 8 weeks post-partum, the pain intensity in both groups had decreased relative to that at baseline. However, as presented in Table 3, difference in mean change of the pain intensity was not statistically significant between the groups (t = -.796, p = .430). Moreover, functional limitations, flexibility, functional status, and depression did not differ significantly between the intervention and control groups at 8 weeks after delivery (Table 3).

After 8 weeks of intervention, all subjects said that they improved. Pain intensity decreased from 5.63(SD = 1.98) at baseline to 2.31(SD = 1.95) at 8weeks after delivery. However, 44 (84.6%) of the 52 subjects reported

Table 1. Homogeneity Test for Characteristics at Baseline

Characteristics		Intervention Group (n=27) n (%)	Control Group (n=25) n (%)	x^2 or t	p
General characteristics					
Maternal age (years)	Mean±SD	28.3±3.2	27.2±4.0	1.10	.28
Education	High school	13 (48.1)	9 (36.0)	.79	.27
	College	14 (51.9)	16 (64.0)		
Employment status	Unemployed	22 (81.5)	18 (72.0)	.66	.32
	Employed	5 (18.5)	7 (28.05)		
Income	< 1,500,000	12 (44.4)	9 (36.0)	1.27	.53
(won/month)	1,500,000-2,000,000	5 (18.5)	8 (32.0)		
	> 2,000,000	10 (37.0)	8 (32.0)		
Obstetric characteristics					
Delivery (weeks)	Mean±SD	39.8±1.0	39.9±1.2	-.20	.85
Parity	Primipara	16 (59.3)	12 (48.0)	.42	.58
	Multipara	11 (40.7)	13 (52.0)		
Method	Vaginal of delivery	21 (77.8)	15 (60.0)		
Of delivery	C-section	6 (22.2)	10 (40.0)	1.93	.17
Use of anesthesia	No	15 (55.6)	19 (76.0)	2.40	.12
	Yes	12 (44.4)	6 (24.0)		
Feeding type	Breast feeding	9 (33.3)	9 (36.0)	1.93	.38
	Bottle feeding	7 (25.9)	10 (40.0)		
	Mixed feeding	11 (40.7)	6 (24.0)		
Postpartum caregiver*	No	0 (0.0)	2 (8.0)	1.59	.23
	Yes	27 (100.0)	23 (92.0)		
Back pain related characteristics					
Onset of back pain (weeks)	Mean±SD	25.3±8.4	26.8±5.9	-.73	.47

*Fisher's exact provability

Table 2. Homogeneity Test for Outcome Variables at Baseline

Dependent Variables	Intervention Group (n=27)	Control Group (n=25)	t	p
	M±SD	M±SD		
Pain intensity (VAS)	5.41±1.93	5.88±2.05	-.857	.395
Functional limitations	30.78±4.62	30.78±6.05	-1.550	.128
Flexibility	-1.13±8.44	-4.03±7.34	1.317	.194
Postpartum functional status*	52.30±11.36	51.96±1069	.110	.913
Postpartum depression*	74.48±15.76	78.64±20.27	-.829	.411

* Measured on 10 days after delivery

Table 3. Effects of Back Pain after Exercise

Variables	Group	Pretest	Posttest	Difference	t	p
		M±SD	M±SD	M±SD		
Pain intensity (VAS)	Intervention	5.41±1.93	1.78±1.97	-3.63±3.05	-.796	.430
	Control	5.88±2.05	2.88±1.79	-3.00±2.61		
Level of functional limitations	Intervention	30.78±4.62	23.41±2.92	-7.65±4.91	-.458	.649
	Control	33.08±6.05	26.16±5.44	-6.92±6.45		
Flexibility	Intervention	-1.13±8.44	1.13±9.01	2.21±8.84	-.287	.776
	Control	-4.03±7.34	-1.23±7.86	2.93±8.69		
Postpartum functional status*	Intervention	52.30±11.36	68.52±9.81	16.22±10.77	-.486	.629
	Control	51.96±10.69	69.76 ±10.80	17.80±12.60		
Postpartum depression*	Intervention	74.48±15.76	75.85±20.66	1.37±14.23	.467	.642
	Control	78.64±20.27	78.24±22.97	-.040±12.98		

*Pretest: Measured on 10 days after delivery

that they still have pain.

DISCUSSION

Contrary to hypothesis, this study found that an intervention (a back-pain-relief program) for this study was not effective. Although the back pain experienced by women in both groups was lower at 8 weeks post-partum than during the antepartum period, the decrease was not significantly greater in the intervention group than in the control group. This result is consistent with a previous study (Mens et al., 2000), in which diagonal trunk muscle exercise was ineffective to increase muscle force to reduce pain. However, other previous studies reported significant positive results in favor of exercises to decrease the pain intensity (Nilsson-Wikmar et al., 2005; Stuge et al., 2004). Lack of effect in this study may be influenced by the way in which instructions for the exercise were given to the subjects. The subjects performed the exercises at home, instructed by videotape, without personal guidance and supervision. Stuge, Holm, and Vøllestad (2006) reported that personal instruction and guidance improve the quality of the performance and increase the motivation to exercise. Moreover, a videotape provide no possibility to guide a patient in choice, dosage or optimal performance of exercising, or to adapt a treatment program to each individual. An alternative explanation might be that a non-random sample that was too small to detect existing significant differences between the groups. A third explanation for lack of effect is that exercising for 8 weeks possibly too short to have a significant effect. Therefore, future intervention studies would provide more robust findings from an individualized and supervised exercising program with larger scale studies employing random sampling procedures and measuring long term effects.

Flexibility did not differ significantly between the two groups, in contrast to Moon et al. (2000) reporting that back-pain-relief exercise increased flexibility. This discrepancy may be attributable to differences in how the flexibility was measured. We used only flexion to measure flexibility, and so future studies should consider the use of other methods.

The post-partum functional status did not differ significantly between the two groups, which may be due to traditional Korean lay post-partum care called Sanhujori in Korea. Sanhujori is the term used for the traditional Korean concept of non-professional postpartum care after delivery differing substantially from that in Western countries. Sanhujori in Korea emphasizes rest as the means to post-partum recovery (Kim-Godwin, 2003; Schneiderman, 1996; Yoo, 1999), resulting in almost all Korean women being confined to bed for 3 weeks postpartum, with their own needs and those of their infants being taken care of by families and other caregivers. In contrast, Western societies encourage the woman to care for both herself and the infant. The Korean practices may have resulted in a low between-group variance in the functional status.

Previous studies have found a significant relationship between back pain and post-partum depression (Brown & Lumley, 2000; Lumley et al., 2003; Oh & Kim, 2004). A correlation study with a Korean sample (Oh & Kim, 2004) found that the intensity of post-partum back pain was positively correlated with post-partum depression. However, no such relationship was found in the present study. This may be due to post-partum depression being influenced more by psychosocial factors rather by physical factors such as back pain. A recent meta-analysis identified 13 predictors of post-partum depression

(Beck, 2001), with no physical factor being identified. Future studies should attempt to clarify the relationship between post-partum depression and back pain.

Some limitations need to be considered and should be addressed by future studies. The measure used to assess post-partum functional status in this study may not be culturally sensitive to Korean women. Culturally sensitive measurement to measure postpartum functional health needs to be developed. Moreover, the presence and distribution of low-back pain was measured using a pain drawing, which does not allow differentiation between lumbar back pain and posterior pelvic pain. Previous studies have highlighted the importance of distinguishing between these two types of pain in pregnant women, because the two symptoms should be treated in different ways and the outcomes of interventions differ between them (Östgaard, Zetherström, & Roos-Hansson, 1994; Östgaard et al., 1997; Sturesson, Uden, G., & Uden, A., 1997). Future studies should therefore also employ clinical assessments that are more objective than pain drawings.

CONCLUSIONS

A back-pain-relief program designed for this study was not effective to reduce the back-pain intensity in post-partum women and decreased the associated functional limitations. However, considering substantial prevalence of post-partum back pain and their influence of post-partum recovery, there are several implications for nursing professionals. Nurses should teach safe and effective back-pain-relief programs to antepartum and post-partum Korean women, and women with post-partum back pain should be evaluated routinely by nurses during post-natal check-ups and home visits. Moreover, as Carr (2003, p.500) noted, "nurses are first-line providers for basic screening and triage and can replace the 'just accept it' attitude with a sound assessment of the need for effective therapeutics." Nurses need to educate pregnant women about the benefits of contemporary post-partum care and to provide strategies to help them to integrate their beliefs and the practices recommended in contemporary health care practice.

Finally, randomized controlled trials using an individualized and supervised intervention for pregnancy-related back pain after delivery are need to be developed and evaluated. Moreover, future studies should also focus on the development of methods to help women with posterior back pain, and employ longer follow-up periods.

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