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The Effect of Training Pregnant Women and Their Husbands on Health Promoting Behaviors during Pregnancy and Postpartum Period

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ABSTRACT

BACKGROUND AND OBJECTIVE: Health promoting lifestyle is any kind of action that is taken to maintain the health of the individual. Healthy lifestyle plays an important role in improving the maternal-fetal outcomes. The aim of this study is to determine the effect of training pregnant women and their husbands on health promoting lifestyle.

METHODS: This clinical trial was conducted among 189 pregnant women in the city of Bukan, Iran. Participants were categorized into three groups: the recipients of the training along with their husbands (the first intervention group), the recipients of the training without their husbands (the second group of intervention) and the routine care recipients (control group). Four sessions of group training were held for mothers of both interventional groups and one group training session was held for the mothers of the first intervention group regarding sleep health, nutrition, physical activity, self-image and sexual issues. Health promoting lifestyle questionnaire (score range: 52 - 208) was completed and assessed before the intervention, eight weeks after the intervention and six weeks after delivery.

FINDINGS: There was no statistically significant difference between the groups before the intervention in terms of the total score of health promoting lifestyle. Eight weeks after the intervention, the mean score of health promoting lifestyle was 162.2±2.5 in the first group, 153.6±2.5 in the second group and 133.4±2.4 in the control group, which was significantly higher in both intervention groups compared to the control group ($p<0.001$). Six weeks after delivery, the mean score of health promoting lifestyle was 159.8±3.0 in the first group of intervention, 143.1±3.0 in the second group and 133.7±3.0 in the control group, which was significantly higher in the first group of intervention compared to the second group of intervention ($p=0.003$) and control group ($p<0.001$).

CONCLUSION: The results of the study showed that training pregnant women along with their husbands or training the women alone improves lifestyle. However, training pregnant women along with their husbands proved to be more effective than training the women alone.

KEY WORDS: *Training, Lifestyle, Pregnancy, Postpartum Period.*

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Introduction

Health promotion is a process that enables people to control their health (1, 2), with the highest emphasis on preventing disease and self-care (3). Pender et al. classify health promotion behaviors in six dimensions: nutrition, physical activity, stress management, personal health responsibility, interpersonal relationships, and spiritual growth (4). Health promotion includes behaviors in which a person complies with appropriate nutrition, regular exercise, avoiding destructive behaviors, timely diagnosis of symptoms, emotional control, coping with stress, and modification of interpersonal relationships (5). Healthy lifestyle during pregnancy plays an important role in improving the outcomes of mother and fetus (6). Physical activity during pregnancy reduces the risk of poor outcomes such as preeclampsia, gestational diabetes, early delivery, postpartum depression, etc. (7–10). Moreover, physical activity during pregnancy improves labor process (11).

Pregnant women tend to have less physically compared with non-pregnant women (12, 13). One of the important factors that affects maternal and fetal health is nutrition (14). Inadequate nutrition during pregnancy increases the risk of low birth weight, neural tube defect, preeclampsia, gestational diabetes and the birth of premature infants (15) and educating appropriate nutrition plays an important role in preventing these poor outcomes (16). Obesity and overweight are the common health problems that are caused by an increase in the prevalence of unhealthy lifestyle (17). About 50% of women of reproductive age and 14% of pregnant women are overweight or obese, which leads to an increase in pregnancy complications such as preeclampsia, diabetes, fetal macrosomia and increase in cesarean section (18, 19). Low levels of consuming fruits and vegetables and a high levels of consuming soft drinks and TV dinner have been reported in pregnant women (20, 21).

Training to change behavior and, consequently, reducing complications from unhealthy nutrition is highly important (14, 16). Smoking and alcohol consumption are among the unhealthy behaviors that have destructive effects on the maternal and fetal outcomes (22 – 24). Routine care during pregnancy in Iran is based on the World Health Organization recommendation (25) and starts in the first trimester of pregnancy and includes early pregnancy tests, genetic screening, recommendations for using folic acid supplementation and proper nutrition, physical activity, screening and treating anemia, iron deficiency and sexually transmitted infections and the assessment of the mother for potentially preventable diseases, such as diabetes, and recommendations for the risks of unhealthy lifestyle such as smoking, alcohol abuse, substance abuse, and so on.

Considering the poor outcomes caused by unhealthy behaviors and the effects of obesity and overweight, malnutrition, etc. on maternal and fetal health, and the need for adopting health promoting behaviors during pregnancy and postpartum period, and due to the low cost and ease of educational interventions and considering that based on the reviews, no similar study was found in this field, the present study was conducted to determine the effect of training pregnant women alone or along with their husband on health promoting lifestyle during pregnancy and postpartum period.

Methods

After obtaining permission from the Ethics Committee of Tabliz University of Medical University (code 93124), and registered in the clinical trial system with the code IRCT201410113706N23, this randomized controlled clinical trial study was conducted among 189 pregnant women selected from the women referred to Bukan Health Centers. The follow up was continued for up to six weeks after delivery. Pregnant women at gestational age of 24 – 28 weeks, singleton pregnancy and uncomplicated pregnancy, first or second pregnancy, having at least elementary school education, not participating in other similar studies, having a contact number for follow-up, the willingness of the mother and her spouse to attend classes were included in the study. Women with the risk of preterm childbirth or having an underlying disease (such as diabetes, etc.) were excluded. This study is part of a major trial in which depression and anxiety variables were evaluated as the primary outcome. Their results have been published in other papers (26, 27). The sample size was calculated based on the variables of depression, anxiety and health promoting lifestyle using G-power software. The largest sample size according to the depression variable, based on the study of Jamshidimanesh et al. (28) and considering $m_1 = 9.79$, $sd_1 = sd_2 = 4.17$ with an assumption of 20% reduction in the depression score after intervention ($m_2 = 7.83$), $\alpha = 0.05$, $\beta = 0.2$, was calculated to be 57 people and considering 10% drop, the final sample size was considered to be 63 in each group.

Referring to the centers, the researcher first examined the available criteria for all pregnant women in terms of the required criteria and, if they were eligible, a written informed consent was obtained and the Health Promoting Lifestyle Profile was completed by participants. Using randomized block design with three and six blocks and allocation ratio of 1 : 1 : 1, the participants were categorized into three groups: the recipients of the training along with their husbands (the first intervention group), the recipients of the training without their husbands (the second intervention group) and the recipients of routine care (control group), including control of the weight, height and vital signs of the mother and fetus, and periodic monitoring of maternal and fetal health. The type of intervention was written on paper and placed inside the opaque and sealed envelopes with consecutive numbers.

Educational content included sleep hygiene, nutrition, activity and exercise, self-concept and sexual issues. Four sessions of group training for 60 – 90 minutes (in weeks 24–28) were held for mothers by a researcher at health centers and one session of group training was held for husbands by a male psychologist at the health center after the first training session for mothers. An instruction booklet was provided for the mothers of the intervention group in the first training session and it was emphasized that pregnant women should read this booklet along with their husband. The contents of the booklet included anatomy, pregnancy physiology, sleep hygiene, nutrition, prenatal exercises, sexual issues, and so on.

At intervals between sessions and afterwards, telephone counseling was given to the mothers once a week for 10 minutes to remind the important subjects taught at the sessions. Two times telephone counseling was also provided for the husband by a male psychologist. The number of participants in each session was 5 to 15 people. Thirty final minutes of each session was dedicated to the questions and answers. The researcher provided a contact number for answering the questions.

Sociodemographic characteristics and health promoting lifestyle questionnaires were completed before intervention, eight weeks after intervention and six weeks after delivery. The Health Promoting Lifestyle Profile includes six areas of health responsibility, physical activity, nutrition, spiritual growth, stress management, and interpersonal relationships. The questionnaire has 52 questions and each question has 4 answers: never (1), sometimes (2), often (3) and always (4). The total health promotion lifestyle score ranges from 52 to 208. This questionnaire was validated in Iran, and Cronbach's alpha for the whole questionnaire was 0.82 and for the six dimensions was 0.64 - 0.91, respectively (29). Data were analyzed using SPSS software version 21. Normality of the quantitative data was verified using Kolmogorov-Smirnov test. Chi-square, Fisher's exact test, and one-way ANOVA were used to verify the consistency between the groups. ANCOVA test with baseline score control was used for comparing the mean lifestyle score between the groups before the intervention, eight weeks after the intervention (gestational weeks 32 – 36) and six weeks after delivery. Repeated Measure ANOVA was used to evaluate changes over time. All analyses were done through intention-to-treat (ITT) and $p < 0.05$ was considered significant.

Results

Of the 1,090 examined pregnant women, 208 were eligible, of which 189 were eventually selected, and were randomly divided into three groups of 63 people. Two people were excluded from the study because they did not want to continue their cooperation. The first person one was from the first intervention group, who was excluded at the beginning of the third training session, and the second one was from the second intervention group, who did not participate in the follow-up eight weeks after the intervention. Eventually, 187 people cooperated until the end of the study, among which, two women had vaginal delivery because of spontaneous onset of labor pain at the gestational age of 32 – 34 weeks and one woman had caesarean section at the gestational age of 32 weeks due to severe preeclampsia (Fig. 1).

There was no significant difference in terms of sociodemographic characteristics between the two groups. The mean age of participants was 27.8±5 years. About one third of women (34.3%) had secondary education. The majority of women (89.4%) were housewives. Most pregnancies (89.4%) were intended pregnancies. Few women (2.6%) reported having very little support from their spouse (Table 1).

The mean total score of health promoting lifestyle before intervention in the first intervention group was 135.8±20.9, in the second intervention group was 140.3±19.1 and in the control group was 140.1±20.2, and there was no significant difference between the

groups. The mean total score of health promoting lifestyle eight weeks after intervention in the first intervention group was 162.2±2.5, in the second intervention group was 153.6±2.5 and in the control group was 133.4±2.4, and the mean total score of health promoting lifestyle in the first intervention groups (mean difference = 28.8; 95% confidence interval = 20.2–37.3) and the second intervention (20.1; 11.6–28.7) showed statistically significant increase compared to the control group ($p < 0.001$). However, there was no significant difference between the two intervention groups (8.6; -0.01 – 17.2, $p = 0.257$).

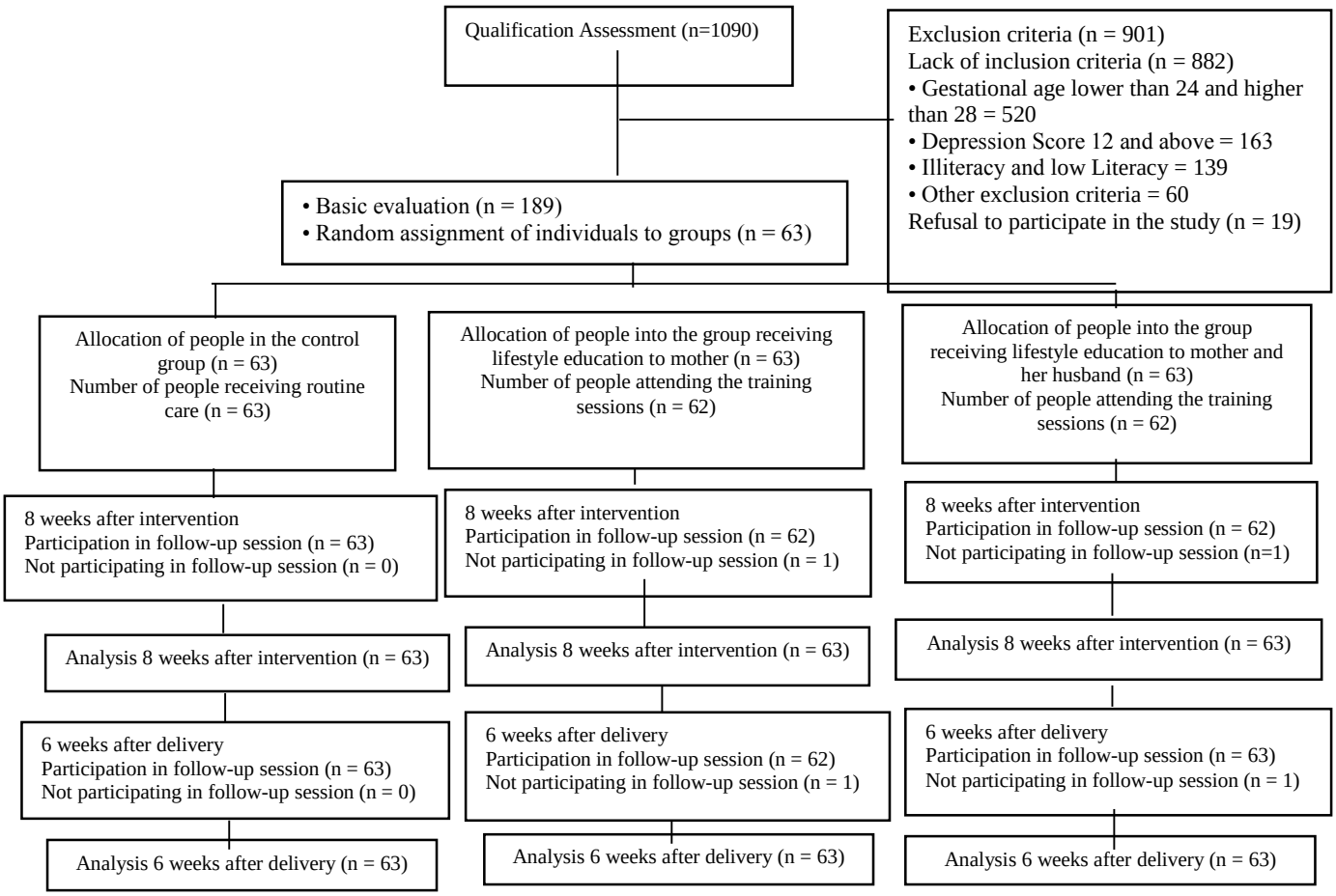

Figure 1. Flowchart o f participants in the study

The mean total score of health promoting lifestyle six weeks after delivery in the first group was 159.8±3.0, in the second group was 143.1±3.0 and in the control group was 133.7±3.0, which showed significant increase in the first intervention group compared with the control group (26.1; 15.8–36.5, $p<0.001$) and the second intervention group (16.7; 6.3–27.2, $p=0.003$), but there was no significant difference between the second intervention group compared to the control group (9.3; -0.9 – 19.7, $p = 0.097$). The effect of time on the mean total score of health promoting lifestyle in the first and second groups was significant ($p < 0.001$), but no significant effect was observed in the control group ($p = 0.62$) (Table 2). There was no statistically significant difference between the groups before the intervention in terms of mean scores of subdomains. Eight weeks after intervention, the mean score of all lifestyle subdomains in both the first and second groups of intervention was significantly higher than the control group, and six weeks after delivery, the mean score of all subdomains in the first intervention group and the mean score of subdomain of spiritual growth in the second intervention group showed a statistically significant increase compared to the control group.

Table 1. Sociodemographic characteristics of participants in intervention and control groups (n = 63)

Characteristics	Training the mother and husband N(%)	Training the mother N(%)	Control N(%)	P-value
Age (year) * Mean±SD	28.2±5.1	27.5±4.9	27.7±4.9	0.671 **
Education				† 0.765
Middle school	22 (34.9)	23 (36.5)	20 (31.8)	
High school	7 (11.1)	12 (19.1)	10 (15.8)	
Diploma	15 (23.8)	15 (23.8)	19 (30.2)	
University degree	19 (30.2)	13 (20.6)	14 (22.2)	
Job				§0.946
Housewife	57 (90.5)	56 (88.9)	56(887.9)	
Employee	6 (9.5)	7 (11.1)	7 (11.1)	
Husband's education				†0.266
Elementary school	17 (27.0)	20 (31.07)	22 (35.0)	
Middle school	22 (35.0)	11 (17.46)	9 (14.02)	
Diploma				
University degree				
Husband's job				0.701 §
Employee	20 (31.07)	18 (28.57)	19(30.15)	
worker	11 (17.46)	13 (20.63)	10 (15.9)	
Self-employed, driver	32 (50.8)	32 (50.8)	34 (54.0)	
Body Mass Index (BMI) before pregnancy (kg / m²) ¥				†0.708
18.5 – 24.9	13 (20.6)	18 (28.6)	15 (23.8)	
25 – 29.9	37 (58.8)	26 (41.3)	33 (52.4)	
30 ≤	13 (20.6)	19 (30.1)	14 (22.2)	
Sufficiency of monthly income for living expenses				†0.257
Sufficient	22 (34.9)	26 (41.3)	25 (39.7)	
Fairly sufficient	37 (58.7)	34 (54.0)	38 (60.3)	
insufficient	4 (6.4)	3 (4.8)	0 (0.0)	
The average number of pregnancies *	1.5±0.5	1.6±0.6	1.6±0.7	□ □□□ 0.669
Parity				‡0.979
Nulliparous	32 (50.8)	31 (49.2)	32 (50.8)	
Multiparous	31 (49.2)	32 (50.8)	31 (49.2)	
Pregnancy				‡0.409
Wanted	55 (87.3)	55 (87.3)	59 (93.6)	
Unwanted	8 (12.7)	8 (12.7)	4 (6.4)	
The husband's support				†0.920
low	6 (9.5)	5 (7.9)	4 (6.4)	
average	29 (46.0)	34 (54.0)	33 (52.4)	
high	28 (44.5)	24 (38.1)	26 (41.2)	
Family members support				†0.886
low	8 (12.7)	11 (17.5)	6 (9.5)	
average	38 (60.3)	33 (52.4)	36 (57.1)	
high	17 (27.0)	19 (30.1)	21 (33.4)	

□The numbers represent the mean. ** One-way ANOVA test. † Chi-square process. ‡ Fischer's exact test. § Chi-square test. ¥ One person (1.6%) in control group had BMI lower than 18.5%.

Table 2. Comparison of the mean total score of health promoting lifestyle and its subdomains in the study groups

Variable	Intervention1 Mean±SD	Intervention2 Mean±SD	Control Mean±SD	Comparison between groups		
				Intervention 1 and control MD (CI-95%)†	Intervention 2 and control MD (CI-95%)†	Intervention 1 and intervention 2 MD (CI-95%) †
Overall score of HPLP-2 (Score range: 52-208)						
Before intervention	135.8±20.9	140.3±19.1	140.1±20.2	-3.4 (-12.9–4.3)	0.2 (-8.4–8.8)	-4.5 (-13 – 4.1)
Eight weeks after the intervention	162.2±2.5	153.6±2.5	133.4±2.4	28.8 (20.2–3.37)	20.1(11.6– 28.7)	8.6(-0.01– 17.2)
Six weeks after childbirth	159.8±3.0	143.1±3.0	133.7±3.0	26.1 (15.8 – 36.5)	9.3 (-0.9 – 19.7)	16.7 (6.3 – 27.2)
Time effect (p) **	< 0.001	< 0.001	< 0.001			
Nutrition (Score range: 9-36)						
Before intervention	25.1±4.1	26.4±3.6	26.4±4.1	-0.4(-1.2–1.3)	0.0 (-1.7 – 1.7)	-0.4 (-1.2 – 1.3)
Eight weeks after the intervention	30.5±3.7	29.1±4.3	26.2±4.2	4.3 (2.6 – 5.9)	2.9 (1.2 – 4.5)	1.4 (-0.3 – 3.0)
Six weeks after childbirth	30.3±4.6	27.9±4.5	26.2±4.9	4.1 (2.0 – 6.1)	1.7 (-0.2 – 3.7)	2.3 (0.3 – 4.3)
Time effect (p) **	< 0.001	< 0.001	< 0.941			
Physical activity (Score range: 8-32)						
Before intervention	13.9±4.5	14.5±4.1	14.7±3.8	-0.8 (-2.5–1.0)	-0.1 (-1.9–1.6)	-0.6 (-2.4 – 1.1)
Eight weeks after the intervention	20.3±4.9	18.6±4.3	14.0±4.2	6.3 (4.5 – 8.1)	4.6 (2.8 – 6.4)	1.6 (-0.2 – 3.4)
Six weeks after childbirth	19.1±5.4	15.9±4.3	14.9±4.4	4.2 (2.3 – 6.2)	1.0 (-0.9–3.0)	3.2 (1.2 – 5.2)
Time effect (p) **	< 0.001	< 0.001	< 0.363			
Healthcare Responsibility (Score range: 9-36)						
Before intervention	25.1±5.2	26.0±5.1	25.7±5.0	-0.6 (-2.8–1.5)	0.3 (-1.8 – 2.5)	-0.1 (-3.1 – 1.2)
Eight weeks after the intervention	28.9±4.0	28.7±4.4	25.2±5.3	4.0 (2.3 – 5.8)	3.3 (1.5 – 5.1)	-0.7 (-1.0 – 2.5)
Six weeks after childbirth	22.3±3.4	20.6±3.9	20.2±5.0	2.1 (0.13 – 3.7)	0.4 (-1.2 – 2.1)	1.6 (-0.0 – 3.4)
Time effect (p) **	< 0.001	< 0.001	< 0.001			
Stress Management (Score range: 8-32)						
Before intervention	19.4±3.7	20.4±3.7	20.6±5.1	-1.2 (-2.8–0.5)	-0.1 (-1.8–1.5)	-1.1 (-2.7 – 0.6)
Eight weeks after the intervention	23.2±3.7	22.0±3.8	18.8±4.4	4.7 (3.0 – 6.3)	3.2 (1.5 – 4.8)	1.5 (0.2 – 3.1)
Six weeks after childbirth	22.8±5.7	19.6±3.9	18.7±4.6	4.2 (1.2 – 6.3)	0.9 (-1.2 – 2.9)	3.3 (1.2 – 5.4)
Time effect (p) **	< 0.001	< 0.001	< 0.004			
Interpersonal elationships (Score range: 9-36)						
Before intervention	25.2±4.2	25.8±4.6	25.5±4.2	-0.3 (-1.2 – 1.6)	0.3 (-1.5 – 2.1)	-0.6 (-2.4 – 1.3)
Eight weeks after the intervention	29.0±4.5	27.0±4.2	24.6±5.5	4.4 (2.4 – 6.2)	2.4 (0.5 – 4.3)	1.9 (0.0 – 3.8)
Six weeks after childbirth	28.6±4.9	26.3±4.6	24.3±5.6	4.3 (2.2 – 6.3)	2.0 (-0.0 – 4.0)	2.3 (0.2 – 4.3)
Time effect (p) **	< 0.001	< 0.065	< 0.157			
Spiritual growth (Score range: 9-36)						
Before intervention	26.2±4.6	27.0±4.2	27.0±4.5	-1.0 (-2.9–0.9)	-0.2 (-2.0–1.7)	-0.8 (-2.7 – 1.0)
Eight weeks after the intervention	29.6±3.7	28.4±3.7	24.8±5.1	4.8 (3.0 – 6.5)	3.6 (1.8 – 5.3)	1.2 (-0.6 – 2.9)
Six weeks after childbirth	30.2±4.6	27.0±4.9	24.5±5.5	5.7 (3.5 – 7.7)	2.5 (0.4 – 4.6)	3.1 (1.0 – 5.2)
Time effect (p) **	< 0.001	< 0.024	< 0.001			

 Mean (standard deviation), † mean difference (95% confidence interval), intervention 1: training the mother and her husband, intervention 2: training only the mother. ** To measure change over time in groups, Repeated Measure ANOVA test was used. One-way analysis of variance was used to compare the groups before intervention and ANCOVA test with baseline control was used after intervention

Discussion

The results of this study showed that training pregnant women and their husband and educating pregnant women alone has an impact on the promotion of lifestyle during pregnancy and postpartum period, which is consistent with the results of other studies. The results of a study based on the PRECEDE-PROCEED model in patients with type 2 diabetes showed that training is effective in improving self-care behaviors (30). In another study, training has led to improved self-care behaviors in pregnant women with gestational diabetes (31). The results of the study by Mirmolaei et al. also showed the positive effects of antenatal classes on health behaviors (32).

Educational interventions regarding healthy eating behaviors have been reported to improve the knowledge and behavior of pregnant women (33). The results of a study by Shakeri showed that the education program based on the BASNEF Model (Belief, Attitude, Subjective Norm and Enabling Factors) improved nutritional behaviors in pregnant women (34). The results of the study by Mirmolaei et al. also indicated the positive effects of educational interventions on healthy eating behaviors in pregnant women (35). The positive effect of training during pregnancy on other health promoting behaviors has also been observed. Shakeri et al. also showed a positive effect of training on physical activity (36).

In their study among women with diabetes mellitus, Evans et al. concluded that continuing training during the postpartum period is necessary to maintain changes in lifestyle during pregnancy (37). In the present study, simultaneous training of the mother and her husband has a greater impact on the overall score of lifestyle and some of its domains, compared with training the mother alone. Dehcheshmeh et al. showed that the presence of spouses in physiological delivery classes increases the quality of life scores (38). The results of the study by Mullany et al. showed that the health behaviors of pregnant women who were trained along with their husbands were more than women who were trained alone and women who did not receive any training (39). The results of the above studies are consistent with the present study and can show the supportive role of the husband. Therefore, it seems that husbands should be involved in all interventions designed for pregnant women. The results of this study showed that among the dimensions of lifestyle, "physical activity" had the lowest average score, indicating that women are unwilling to exercise during pregnancy and the postpartum period. This finding has also been observed in other studies (40-43).

Moreover, consistent with other studies (43, 44), the results of this study showed that among the dimensions of lifestyle, spiritual growth has the highest average score, perhaps due to the religious beliefs of the Iranian people. The presence of pregnant women's husband in this study can be considered as one of its strengths. It is suggested that in future studies, social support of the husband should be evaluated with appropriate tools. Other strengths of this study were the observance of the principles of clinical trials, including random allocation, allocation concealment, and so on. One of the limitations of the present study was that due to the high level of illiteracy and low literacy among women and other exclusion criteria, of 1090 pregnant women, only 208 were eligible to enter the study. Since educational status can affect lifestyle as one of the social status factors (42), the results of this study should carefully be generalized to other populations (with a low level of literacy). Given the low cost and easy implementation of educational interventions and the ability to integrate them with prenatal care, the use of these interventions as part of care is suggested.

The results of this study showed that training pregnant women and their husband and women alone would improve health promoting lifestyle. Given the low cost and easy implementation of educational interventions, healthy lifestyle education should be an integral part of health care for pregnant women, and midwives should play a prominent role in encouraging pregnant women to participate in health behaviors.

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