Original Article

Access this article online

Quick Response Code:

Website:
www.jehp.net

DOI:
10.4103/jehp.jehp_88_20

Comparing the effect of group training and telemedicine on exercise during pregnancy: An application of the health belief model

Zahra Sheibani Matin[1], Samira Khayat[2], Ali Navidian[2], Hamed Fanaei[2]

Abstract:

INTRODUCTION: Many women refuse to exercise during pregnancy due to lack of awareness and not receiving training. The aim of this study was to investigate and compare the effect of group and telemedicine education on exercise during pregnancy by using the health belief model (HBM).

MATERIALS AND METHODS: This quasi-experimental study was carried out in 2019 in Zahedan, and a total of 135 pregnant women participated in it. Samples were randomly assigned to the following three groups: group training ($n = 45$), telemedicine ($n = 45$), and control ($n = 45$). Group training was presented in three sessions, and the telemedicine group received the educational content through mobile applications. The samples completed the HBM questionnaire before and 6 weeks after the intervention. In addition, within 6 weeks after the intervention, they completed the exercise activity schedule. SPSS software Ver. 16 (IBM Corp, Armonk, NY, USA) was used for analysis, and data were analyzed by ANOVA, Tukey's *post-hoc* test, Kruskal–Wallis test, and Mann–Whitney test.

RESULTS: After intervention, the scores of HBM constructs and exercise levels in group training, telemedicine group, and control group, respectively, were as follows: perceived susceptibility 25.91 ± 3.24, 25.51 ± 1.97, and 22.55 ± 3.78; perceived severity 27.48 ± 2.27, 25.13 ± 2.29, and 22.51 ± 3.88; perceived benefits 27.28 ± 2.97, 25.68 ± 3, and 22.8 ± 3.05; perceived barriers 10.69 ± 2.69, 10.66 ± 3.19, and 14.17 ± 3.14; cues to action 24.71 ± 4.35, 23.9 ± 2.48, and 22.84 ± 3.02; self-efficacy 26.17 ± 3.05, 25.2 ± 2.82, and 22.51 ± 3.38; and exercise levels 70.99 ± 20.43, 56.51 ± 21.99, and 37.62 ± 29.66. Group training and telemedicine led to significant improvement in all HBM constructs and exercise levels ($P < 0.05$, $P < 0.0001$, and $P = 0.003$, respectively). Group training provided more improvement than telemedicine in the scores of perceived severity ($P < 0.0001$), perceived benefits ($P = 0.001$), cues to action ($P = 0.02$), and mean exercise time ($P = 0.001$).

CONCLUSION: The results of this study showed that the HBM is a proper model for exercise education in pregnant women. It is recommended to use HBM as a group training and telehealth in promoting the rate of exercise in pregnant women.

Keywords:

Educational, exercise, models, pregnancy, telemedicine

[1]Department of Midwifery, School of Nursing and Midwifery, Zahedan University of Medical Sciences, [2]Pregnancy Health Research Center, Zahedan University of Medical Sciences, Zahedan, Iran

Address for correspondence:
Dr. Samira Khayat, Pregnancy Health Research Center, Zahedan University of Medical Sciences, Zahedan, Iran.
E-mail: khayatmsc@yahoo.com

Received: 01-02-2020
Accepted: 24-03-2020
Published: 28-07-2020

Introduction

The College of Obstetrics and Gynecology recommends prenatal exercises for women.[1] Exercises during pregnancy are associated with maternal and fetal benefits, including the decrease of back pain, the severity of labor pain, urinary incontinence,[2] constipation, and muscle cramps.[1] Reduction of fetal meconium amniotic fluid and fetal distress, improvement of placental function, increase of fetal growth, and higher amount of safe fluid volume are fetal

How to cite this article: Matin ZS, Khayat S, Navidian A, Fanaei H. Comparing the effect of group training and telemedicine on exercise during pregnancy: An application of the health belief model. J Edu Health Promot 2020;9:187.

benefits of exercise during pregnancy.[2,3] Exercising not only has physical benefits, but also has psychological advantages such as decreased fatigue, stress, and depression and increased quality of life and sleep pattern. Furthermore, it reduces postpartum depression in women.[3,4]

The majority of pregnant women can exercise without being worried about damaging themselves and the fetus.[5] The American Congress of Obstetricians and Gynecologists recommends at least 30 min of exercise for pregnant women, who have no specific problems.[1] However, most women change their lifestyles during pregnancy by resting for longer periods and refraining from physical activity and exercise.[6] Studies show that pregnant women spend 50% of their time in a sedentary state.[7] A research in the United States demonstrated that only 25% of women exercise during this period.[8] In a study by Dabiran in Tehran, Iran, only 23% of women carried out sufficient exercise during pregnancy.[9] Without exercise, the complications of pregnancy increase, such as excessive weight gain during pregnancy, glucose intolerance, diabetes, preeclampsia, preterm labor, low and high fetal weight for pregnancy,[10] varicose veins, deep-vein thrombosis, and postpartum weight retention.[11]

The decline of exercise during this period can be due to physical changes in pregnancy and the combination of social and psychological factors. Nonetheless, one of the most important causes of reduced physical activity is the low awareness level of these individuals.[12]

In a research by Abedzadeh on pregnant women in Kashan, Iran, 60% of women had moderate awareness of the benefits of exercise in pregnancy, only 19% of them were recommended to exercise, and 39% had physical activity in pregnancy. In addition, only 48% of these people continued to exercise until the end of pregnancy, and there was a significant relationship between awareness and physical activity.[12] Women have a negative attitude toward physical activities during pregnancy due to fear of complications caused by activity and misbeliefs[6] such as fear of the risk of miscarriage and increased pregnancy problems, lack of awareness of ways to exercise during pregnancy, and lack of awareness of the possibility of exercising during pregnancy.[13] Furthermore, women often refrain from physical activities during pregnancy.[14] Occasionally, employees with misconceptions prohibit women from exercising due to the risk of miscarriage, preterm labor, low birth weight, and other problems.[15] Almost half of the caregivers recommend reduced activity during pregnancy.[16] As a result, misconceptions of women and those around them and their lack of awareness prevent exercise during pregnancy, in a way that 60% of women eliminate exercise during this period.[12]

According to studies, the recommendation to exercise during pregnancy is overlooked in related educations, and most pregnant women receive information from friends, magazines, and commercial books instead of the use of training provided by health service providers.[16] In a research in Isfahan, 100% of midwives had poor performance regarding the education of exercise in pregnancy. In addition, 50% of them had moderate knowledge and 62% had a neutral attitude toward education of exercise during pregnancy.[17] This can also contribute to a lack of awareness among pregnant women. As such, correcting misconceptions and raising awareness of women through education can be helpful in promoting exercise in pregnancy. It is generally believed that people need help and education to change health behaviors. On the other hand, educational interventions to promote exercise in pregnancy are limited, and most have been conducted without theories and models. Meanwhile, studies show that training based on models and theories are more effective, compared to general interventions, which result in a faster change of behavior.[18]

One of the educational models in health education is the health belief model (HBM). Focusing on change of personal beliefs, the HBM emphasizes that people's perception creates motivation and leads to a change of behaviors. HBM predicts behaviors based on perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Although one application of this model is to adopt healthy behaviors and prevent disease.[19] HBM-based interventions in exercise during pregnancy field are very limited. Studies have been conducted by Moridi, Shafieian and Kazemi to promote exercise among pregnant women by using HBM.[20,21] However, these interventions have failed to cover all the model's structures in their training, have only focused on the benefits of exercise during pregnancy, and have conducted no comparison among various educational methods.

Theory-based training is possible in a variety of ways, including group training. Today, it is attempted to use theories in telemedicine training. Telemedicine involves the exchange of health and medical information with various means of communication to improve health. Telemedicine is a strategy to reduce costs and increase fair access to quality health services.[22] Given the limited resources in developing countries, the use of theory-based interventions along with telemedicine is an option for these countries. Inadequate resources in these countries lead to the inappropriate and unfair provision of services, and telemedicine has received special attention as a viable solution[23] given its ability to provide remote education, counseling, and survey and improve the level of service provision.[22] Some of the benefits of telemedicine are increasing access to health-care services, making education cost-effective, increasing access to education, elevating the level of social support, improving treatment outcomes, and enhancing the quality of services.[24]

No research has compared the effectiveness of group training and telemedicine to promote exercise. While comparing the methods, one can choose the most effective and the least costly. Some studies have separately assessed group education and telemedicine for exercise promotion, which are rarely based on educational models. Therefore, with regard to the duties of midwives and their role in the promotion of women's health, especially during pregnancy, the present study aimed to compare the effect of group training and telemedicine on exercising during pregnancy using the HBM on pregnant women in Zahedan, Iran.

Materials and Methods

This quasi-experimental study was conducted in 2019 and included 135 pregnant women who referred to health-care centers in Zahedan, Iran.

Ethics

The study was approved by the ethics committee of Zahedan University of Medical Sciences (code: IR.ZUMS.REC.1398.029).

Study design

Selection and description of participants

The inclusion criteria were as follows: age range of 18–35 years, gestational age of 14–28 weeks, first to fourth pregnancy, no history of infertility, no smoking, and lack of contraindication of exercise in pregnancy. The exclusion criteria were as follows: occurrence of any type of complication that would prohibit exercising during the study, absence from a training session, and failure to receive a one-time training in the telemedicine group.

Recruiting and proceedings

The sample size was determined based on the following formula: $N = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2}$. 80% power and 95% confidence interval were considered. The sample size was calculated according to the variables in Shafieian's article ($\mu_1 = 19$, $\mu_2 = 17$, $S_1 = 1.38$, and $S_2 = 1.49$),[20] and then considering that the study had three independent groups, the obtained number was multiplied by 1.4. Finally, the sample size was determined to be 45 persons in each group.

Sampling was carried out following the explaining of research objectives, receiving a written consent, and ensuring the confidentiality terms regarding the participants' personal information.

Inclusion criteria were assessed after filling the related form by participants, and those who had no contraindication for exercise and were willing to participate in the study completed the demographic characteristics questionnaire and the HBM scale. The participation method was explained to the participants and their contact number was obtained.

After preparing a list of applicants (n = 135), a number was allocated to each person. Each number was written on a piece of paper. All numbers were placed in a container, then the draw was done, and three groups of 45 members were formed. In this regard, the first 45 numbers were allocated to the group training group, while the second 45 numbers were assigned to the telemedicine education group and the last set of 45 numbers were allocated to the control group.

Group training was the first method of intervention. Each group consisted of five individuals. Education was presented in three sessions (45–60 min) at the health center. The content of training was developed based on HBM constructs. In the first session, the educational content included the benefits and importance of exercising during pregnancy, the consequences of not exercising, and the symptoms showing the need for stopping exercising. The second session consisted of perceived barriers and how to overcome them (conceiving high exercise costs, interference of exercise with daily life, and women's duties at home) and how to plan for exercise sessions. In the third session, a practical example of self-efficacy was presented as a movie, and the movements were practiced with them. Ultimately, a complete booklet was given to the participants as a reminder, and they were suggested to do the exercise at least 3 times per week and record their exercise period in the schedule. To ensure continued participation, the researcher was in touch with the samples weekly.

The second method of intervention was telemedicine. The educational content in the telemedicine training group was similar to that of the group training. The PDF educational files (include text and image of exercise movements) were sent to the participants individually 3 times every other day, following up the participants in the next day to ensure the study of content. In addition, a Q&A meeting and a group discussion were carried out on the next day of sending the educational content in the group that established the goal of promoting exercising during pregnancy. The participants were asked to complete a daily exercise schedule during the 6 weeks of the intervention. Follow-up was carried out every week via the messenger and phone calls by the researcher. On the other hand, no intervention was conducted in the control group, and their participants were asked to complete the schedule table for 6 weeks. Ultimately, the educational files were provided to the participants in the control group to appreciate their cooperation. All of the participants filled the HBM scale at the health-care centers after 6 weeks.

Measurement tools

Data collection tools included a demographic characteristics questionnaire and inclusion criteria survey form, HBM Construct Evaluation Scale, and sports activity schedule. The inclusion criteria survey form encompassed items to assess the inclusion criteria and contraindications to exercise in pregnancy. In order to ensure the evaluation of all exercise contraindications at the beginning of the study, the mentioned form was prepared based on studies on contraindications for exercise in pregnancy and was provided to ten gynecologists.

The HBM questionnaire was a researcher-made scale. The validity of the tools was assessed by ten reproductive and midwifery health professionals, and the content validity index and content validity ratio were estimated at 0.8 and 0.74, respectively. The reliability of the scale was evaluated by the internal consistency method and confirmed at the Cronbach's alpha of 0.76. The questionnaire was based on the HBM constructs, and each dimension includes six items scored based on a 5-point Likert scale. The schedule of exercise activities was used to determine the amount of individual activity. This table included days of the week for a period of 6 weeks. Every day, the samples were recording the amount of time devoted to exercise in the table.

Statistical analysis

Data analysis was performed in SPSS version 16 using descriptive statistics (frequency, percentage, mean, and standard deviation), Shapiro–Wilk test (to evaluate the normal distribution of data), analysis of variance and Tukey's *post hoc* (in case of normal distribution of the data), and Kruskal–Wallis test and Mann–Whitney U-test (in case of nonnormal distribution of data). It is notable that $P < 0.05$ was considered statistically significant.

Results

In total, 135 individuals were included in the study. The individual social characteristics of the research units are shown in Tables 1 and 2.

The Shapiro–Wilk test was performed before the analysis of analytical data to evaluate the normal distribution of the data. Moreover, the Tukey's *post hoc* test was conducted for intergroup comparison of the normally distributed data, whereas the Mann–Whitney U-test was performed for data with nonnormal distribution [Tables 3 and 4].

According to the results, before the intervention, the research groups were homogeneous in terms of the scores of HBM constructs ($P > 0.05$). After the intervention, no significant difference was observed between the group training and telemedicine groups regarding the improved scores of constructs of perceived sensitivity ($P = 0.55$), perceived barriers ($P = 0.57$), and self-efficiency ($P = 0.19$). However, group training more effectively increased the scores of constructs of perceived severity ($P < 0.0001$), perceived benefits ($P = 0.001$), and cues to action ($P = 0.02$), compared to the telemedicine group. Furthermore, group training statistically significantly improved the scores of all constructs, compared to the control group ($P < 0.05$). On the other hand, telemedicine education led to a significant improvement in all scores of the group, compared to the control group ($P < 0.05$) [Table 3].

According to the Kruskal–Wallis test, there was a significant difference in the three groups after the intervention in terms of the level of exercise. In addition, Mann–Whitney U-test demonstrated a statistically significant difference between the group training and telemedicine groups ($P = 0.001$), group training and control groups ($P < 0.0001$), and the telemedicine and control groups ($P = 0.003$) regarding the level of exercise [Table 4].

Discussion

The present study aimed to evaluate the effect of group training and telemedicine on exercise during pregnancy

Table 1: The quantitative sociodemographic characteristics of the participants

Sociodemographic characteristics	Group, mean±SD			ANOVA results (*P*)
	Group training	Telemedicine	Control	
Age (year)	27.75±4.6	26.51±4.47	28.55±4.17	0.17
Gestational age (week)	22.31±3.92	21.26±4.1	20.44±4.26	0.1
Body mass index) kg/m^2)	24.26±3.54	24.24±3.79	25.75±3.66	0.2

SD=Standard deviation

Table 2: The qualitative sociodemographic characteristics of the participants

Sociodemographic characteristics	Group			Chi-square test results (*P*)
	Group training, *n* (%)	Telemedicine, *n* (%)	Control, *n* (%)	
Education				
Primary	12 (26.7)	11 (24.4)	10 (22.2)	0.12
High school	13 (28.9)	15 (33.3)	23 (51.1)	
Academic	20 (44.4)	19 (42.3)	12 (26.7)	
Husband's education				
Primary	10 (22.2)	12 (26.7)	11 (24.4)	0.09
High school	19 (42.2)	15 (33.3)	18 (40)	
Academic	16 (35.6)	18 (40)	16 (35.6)	
Employment status				
Employed	3 (6.7)	6 (13.3)	4 (8.9)	0.9
Homemaker	42 (93.3)	39 (86.7)	41 (91.1)	
Employment status of husband				
Unemployed	3 (6.7)	4 (8.9)	3 (6.7)	0.9
Employed	42 (93.)	41 (91.1)	42 (93.3)	
Gravida				
1	13 (28.9)	16 (35.5)	15 (33.3)	0.14
2	10 (22.2)	17 (37.8)	10 (22.2)	
3	13 (28.9)	8 (17.8)	8 (17.8)	
4	9 (20)	4 (8.9)	12 (26.7)	
Awareness score				
0-1	7 (15.6)	6 (13.3)	10 (22.2)	0.2
2-3	9 (20)	10 (22.2)	12 (26.7)	
4-5	13 (28.9)	18 (40)	12 (26.7)	
6-7	16 (35.5)	11 (24.5)	11 (24.4)	

Tables 3: Comparison of scores of health belief model constructs before and after intervention in the three study groups

Model structure scores	Groups, mean±SD			ANOVA and Kruskal-Wallis test result	Tukey's and Mann-Whitney U-test (*P*)
	Group training	Telemedicine	Control		
Perceived susceptibility					
Before the intervention	21.4±3.57	20.35±4.18	22.08±3.83	P=0.1, F=2.28	0.67#, 0.41##, 0.08###
After the intervention	25.91±3.24	25.51±1.97	22.55±3.78	P<0.0001, χ^2=22.18	0.55*, <0.0001**, <0.0001***
Perceived severity					
Before the intervention	23.11±3.71	21.4±3.9	22.22±3.86	P=0.11, F=2.22	0.09#, 0.51##, 0.56###
After the intervention	27.48±2.27	25.13±2.29	22.51±3.88	P<0.0001, F=38.21	<0.0001#, <0.0001##, <0.0001###
Perceived benefits					
Before the intervention	23.2±4.77	23.91±3.7	22.64±3.17	P=0.4, χ^2=1.81	0.48*, 0.49**, 0.18***
After the intervention	27.28±2.97	25.68±3	22.8±3.05	P<0.0001, χ^2=42.48	0.001*, <0.0001**, <0.0001***
Perceived barriers					
Before the intervention	14.04±3.9	13.76±3.96	14.55±3.51	P=0.57, F=0.56	0.9#, 0.7##, 0.5###
After the intervention	10.69±2.69	10.66±3.19	14.17±3.14	P<0.0001, χ^2=32.33	0.57, <0.0001, <0.0001
Cues to action					
Before the intervention	22.84±3.43	21.91±3.74	22.51±3.58	P=0.46, F=0.78	0.4#, 0.8##, 0.7###
After the intervention	24.71±4.35	23.9±2.48	22.84±3.02	P=0.01, χ^2=8.1	0.02*, 0.01**, 0.04***
Self-efficacy					
Before the intervention	24.17±3.24	22.93±3.35	22.93±2.99	P=0.3, χ^2=2.35	0.17*, 0.19**, 0.9***
After the intervention	26.17±3.05	25.2±2.82	22.51±3.38	P<0.0001, χ^2=23.5	0.19*, <0.0001**, <0.0001***

#Results of ANOVA with Tukey's *post hoc* test to compare the group training and telemedicine groups, ##Results of ANOVA with Tukey's *post hoc* test to compare the group training and control groups, ###Results of ANOVA with Tukey's *post hoc* test to compare the telemedicine and control groups, *Results of Mann-Whitney U-test to compare the group training and telemedicine groups, **Results of Mann-Whitney U-test to compare the group training and control groups, ***Results of Mann-Whitney U-test to compare telemedicine and control groups. SD=Standard deviation

using the HBM. According to the results of the current research, group training improved the mean scores of HBM constructs and enhanced the level of exercise. In a research, SafarZadeh evaluated the effect of group training on postpartum exercise using the HBM in 195 primipara women who were referred to the health

Table 4: Comparison of the level of exercise after the intervention in the three study groups

The amount of exercise	Group, mean±SD			Kruskal-Wallis test result (*P*)	Mann-Whitney U-test (*P*)
	Group training	Telemedicine	Control		
Exercise time	70.99±20.43	56.51±21.99	37.62±29.66	<0.0001	0.001*, <0.0001**, 0.003***

*Results of Mann-Whitney U-test to compare the group training and telemedicine groups, **Results of Mann-Whitney U-test to compare the group training and control groups, ***Results of Mann-Whitney U-test to compare telemedicine and control groups. SD=Standard deviation

centers of Bandar Abbas, Iran. The intervention group received four sessions of group training based on the HBM. In the end, all model's constructs and level of women's exercise increased after the intervention.[25] In another study by Amirzadeh Iranagh and Motallebi, the authors determined the effect of HBM-based educational intervention on the physical activity of old women. Two hundred elderly women from Urmia participated in this study, and the intervention group was educated by 2-session group training. The results showed that education by HBM increased the level of physical activity through improving the awareness level of the participants.[26] Another research on patients with asymptomatic hyperuricemia investigated the effect of a HBM-based intervention on the perception scores of HBM structures and physical activity. One hundred and ninety-three asymptomatic hyperuricemia patients were involved in this study in Shanghai, China. This intervention included educational booklets and classes. The results showed that group training by HBM led to an improvement in the scores of all model's constructs and the level of physical activity.[27]

Another study in Fasa, Iran, investigated the effect of an educational program based on the HBM on preventing osteoporosis in women. The intervention included eight group educational sessions; the results showed that using HBM with a group approach increased the level of exercise and scores of HBM constructs in women.[28] In 2016, Moradi evaluated the effect of education on women's exercise behavior in the second to third trimesters of pregnancy using the HBM. Providing education in the form of theory and practical classes, this scholar reported a significant improvement in all constructs of the model after the intervention, compared to the control group.[21] In line with our findings, we did not find a study that yielded results inconsistent with our results; all of the mentioned studies demonstrated that the use of HBM was an effective strategy to improve the level of exercise in group training. Group training is one of the most common methods of education in health care that enables interpersonal relationships, interaction, question and answer, and discussion. However, barriers such as employment, time, money, and fatigue limit its use.[29]

The other training method is the use of telemedicine that has enabled the transfer of texts, videos, and images in a simple, cost-effective way. As a new training method, telemedicine can be a solution for those who cannot refer to a center in-person for education.[23]

According to the results of the current research, the use of telemedicine training methods increased all constructs of HBM and the level of exercise. A review of the literature revealed a lack of a research on the effectiveness of HBM and telemedicine on exercise. However, some studies have used the social cognitive theory. For instance, Murawski *et al*. conducted a randomized clinical trial using telemedicine and social cognitive theory to improve physical activity in Australian adults. In the end, they revealed the positive, significant effect of theory-based e-health on the promotion of exercise.[30] Willcox *et al*. attempted to determine the possibility and impact of remote health intervention with the use of social cognitive theory on the physical activity of pregnant women. One hundred obese pregnant women from Australia participated in the study. Trainings were delivered via mobile devices; in the end, they found a significant difference between the intervention and control groups in terms of physical activity.[31] Therefore, the use of theories and models can be effective in the promotion of telemedicine training.

After the evaluation of the existing article, no research was found on the comparison of the effect of group training and telemedicine on the level of exercise. According to the results of the current research, group training was more successful in improving the intensity and perceived benefits and cues to action as well as promoting exercise, compared to telemedicine. Groups can create effective self-management by generating opportunities for self-awareness, receiving and providing feedback, implementing peer-to-peer interaction, and becoming acquainted with people who have similar situations and common challenges.[32] These opportunities might have been effective in the success of group training, compared to telemedicine.

The Centers for Disease Control and Prevention recommends a minimum of 150 min of moderate-intensity aerobic exercise per week for pregnant women.[33] In the present study, while the interventions were able to increase the amount of exercise, the weekly exercise duration in all the three groups was lower than the level recommended by the global guidelines. Exercise is a multifactorial behavior influenced by various interpersonal, individual, environmental, economic, and social factors and living conditions of the individual.[34-36] All of these factors can contribute to the lack of exercise for the recommended amount because the change in behavior is more difficult than it is expected to be met by training. This is especially higher in adults because they must be willing to change and use training themselves.[37,38]

The strength of our work was comparing two methods. Comparisons facilitate the choice of method and help service providers choose the best method. In this regard, further studies are recommended to compare the effectiveness of different methods. One of the weaknesses of the present study was the low duration of intervention follow-up, for which it is recommended that studies be conducted with longer follow-ups. The limitation of the study was the use of self-report in the telemedicine group to ensure the participation of participants in training. In this regard, the researcher attempted to reduce the effect of this issue by performing two follow-ups at each time of sending the content.

Conclusion

According to the results of the present study, the HBM was introduced as a suitable method to increase exercise during pregnancy. Both group training and telemedicine groups were able to improve the scores of all HBM constructs and the level of exercise among pregnant women. However, the group training method more effectively increased exercise during pregnancy, compared to telemedicine. Given the problems that hinder some women from receiving group training, the use of telemedicine can be considered as an appropriate replacement to provide more equitable access to services and training. A combination of both methods can be considered in future studies as well.

Acknowledgments
This study was supported by the Zahedan University of Medical Sciences, Zahedan, Iran. The authors thank the Research Assistance and Health Assistance of Zahedan University of Medical Sciences. We thank the management and staff of Health Comprehensive Centers and the participants for their participation. The article is taken from MSc Thesis of Zahra Sheibani Matin of Zahedan University of Medical Sciences, Zahedan, Iran.

Financial support and sponsorship
This study was financially supported by the Zahedan University of Medical Sciences (Grant number 9276).

Conflicts of interest
There are no conflicts of interest.

References

1. American College of Obstetricians Gynecologists. Physical activity and exercise during pregnancy and the postpartum period. Committee Opinion No. 650. Obstetr Gynecol 2015;126:e135-42.
2. Moyer C, Reoyo OR, May L. The influence of prenatal exercise on offspring health: A review. Clin Med Insights Womens Health 2016;9:37-42.
3. Evenson KR, Barakat R, Brown WJ, Dargent-Molina P, Haruna M, Mikkelsen EM, *et al*. Guidelines for physical activity during pregnancy: Comparisons from around the world. Am J Lifestyle Med 2014;8:102-21.
4. Kołomańska-Bogucka D, Mazur-Bialy AI. Physical activity and the occurrence of postnatal depression-a systematic review. Medicina 2019;55:2-16.
5. Davenport MH, Marchand AA, Mottola MF, Poitras VJ, Gray CE, Garcia AJ, *et al*. Exercise for the prevention and treatment of low back, pelvic girdle and lumbopelvic pain during pregnancy: A systematic review and meta-analysis. Br J Sports Med 2019;53:90-98.
6. Jamshidi A, Hossien T, Sajadi SS, Safari K, Zare G. The relationship between sport orientation and competitive anxiety in elite athletes. Procedia Soc Behav Sci 2011;30:1161-5.
7. Fazzi C, Saunders DH, Linton K, Norman JE, Reynolds RM. Sedentary behaviours during pregnancy: A systematic review. Int J Behav Nutr Phys Act 2017;14:32.
8. Evenson KR, Wen F. National trends in self-reported physical activity and sedentary behaviors among pregnant women: NHANES 1999–2006. Prev Med 2010;50:123-8.
9. Dabiran S, Daneshvar Fard M, Hatmi Z. To assess the performance of exercise during pregnancy. Iran J Epidemiol 2009;5:22-6.
10. Di Fabio DR, Blomme CK, Smith KM, Welk GJ, Campbell CG. Adherence to physical activity guidelines in mid-pregnancy does not reduce sedentary time: An observational study. Int J Behav Nutr Phys Act 2015;12:27.
11. Santos-Rocha R, Santos-Rocha R. Exercise and Sporting Activity During Pregnancy. Cham: Springer; 2019.
12. Abedzadeh M, Taebi M, Sadat Z, Saberi F. Knowledge and performance of pregnant women referring to Shabihkhani hospital on exercises during pregnancy and postpartum periods. J Jahrom Univ Med Sci 2011;8:212-18.
13. Noohi E, Nazemzadeh M, Nakhei N. The study of knowledge, attitude and practice of puerperal women about exercise during pregnancy. Iran J Nurs 2010;23:64-72.
14. Downs D, Hausenblas H. Attitude, intention key to exercise in pregnant women. Womens Health Wkly 2003;1:16.
15. Lewis B, Avery M, Jennings E, Sherwood N, Martinson B, Crain AL. The effect of exercise during pregnancy on maternal outcomes: Practical implications for practice. Am J Lifestyle Med 2008;2:441-55.
16. Szymanski LM, Satin AJ. Exercise during pregnancy: Fetal responses to current public health guidelines. Obstetr Gynecol 2012;119:603-10.
17. Shayanmanesh M, Javani Z. Survey of midwives knowledge, attitude and practice upon exercise instruction during pregnancy in health centers of Twon of Isfahan in 1390. IJOGI 2013;15:17-23.
18. Zare F, Aghamolaei T, Zare M, Ghanbarnejad A. The effect of educational intervention based on the transtheoretical model on stages of change of physical activity in a sample of employees in Iran. Health Scope 2016;5:1-8.
19. Sharma M. Theoretical Foundations of Health Education and Health Promotion. Burlington: Jones & Bartlett Learning; 2017.
20. Shafieian M, Kazemi A. A randomized trial to promote physical activity during pregnancy based on health belief model. J Educ Health Promot 2017;6:40.
21. Moridi M. Examining exercise behavior beliefs of pregnant

women's in second and third trimester: Using health belief model. IJMPP 2016;1:69-74.
22. O'Shea J, Berger R, Samra C, Van Durme D. Telemedicine in education: Bridging the gap. Health Educ J 2015;28:64.
23. Cho YM, Lee S, Islam SM, Kim SY. Theories applied to m-health interventions for behavior change in low-and middle-income countries: A systematic review. Telemed J E Health 2018;24:727-41.
24. Pathipati AS, Azad TD, Jethwani K. Telemedical education: Training digital natives in telemedicine. J Med Internet Res 2016;18:e193.
25. SafarZadeh S. The Impact of Education Based on Health Belief Model on Postpartum Exercise in Primiparous Women. Tehran: Tehran University of Medical Sciences; 2014.
26. Amirzadeh Iranagh J, Motallebi S. The effect of health belief model based on education intervention on physical activity of elderly women. J Urmia Nurs Midwifery Fac 2016;13:1050-8.
27. Shao C, Wang J, Liu J, Tian F, Li H. Effect of a Health Belief Model-based education program on patients' belief, physical activity, and serum uric acid: A randomized controlled trial. Patient Preference Adherence 2018;12:1239-45.
28. Jeihooni AK, Hidarnia A, Kaveh MH, Hajizadeh E, Askari A. The effect of an educational program based on health belief model on preventing osteoporosis in women. Int J Prev Med 2015;6:115.
29. Lak P, Noroozi M, Ehsanpoor S. Comparing the effect of two methods of group education and education by multimedia compact disk on mothers' knowledge and attitude about child sexual abuse. Ann Trop Med Public Health 2017;10:1720.
30. Murawski B, Plotnikoff RC, Rayward AT, Vandelanotte C, Brown WJ, Duncan MJ. Randomised controlled trial using a theory-based m-health intervention to improve physical activity and sleep health in adults: The Synergy Study protocol. BMJ Open 2018;8:e018997.
31. Willcox J, Wilkinson S, Lappas M, Ball K, Crawford D, McCarthy E, *et al*. A mobile health intervention promoting healthy gestational weight gain for women entering pregnancy at a high body mass index: The txt4two pilot randomised controlled trial. BJOG 2017;124:1718-28.
32. Banbury A, Nancarrow S, Dart J, Gray L, Parkinson L. Telehealth interventions delivering home-based support group videoconferencing: Systematic review. JMIR 2018;20:e25.
33. American College of Obstetricians and Gynecologists. Exercise During Pregnancy; 2020. Available online: https://www.acog.org/patient-resources/faqs/pregnancy/exercise-during-pregnancy. [Last accessed on 2020 Apr 01].
34. Sabzmakan L, Asghari Jafarabadi M, Nikpajouh A, Bakhtari F. Determinants of physical activity among patients with cardiovascular metabolic risk factors based on the educational factors of PRECEDE model: A mixed method study. Iran J Health Educ Health Promot 2016;4:5-19.
35. Khayat S, Dolatian M, Navidian A, Kasaeian A, Mahmoodi Z. Association between style of living and general health in suburban women: A cross-sectional study in South East of Iran. JCDR 2017;11:LC09.
36. Khayat S, Dolatian M, Navidian A, Mahmoodi Z, Sharifi N, Kasaeian A. Lifestyles in suburban populations: A systematic review. Electron Phys 2017;9:4791.
37. Safarzadeh S, Behboodi Z, Safari M. The impact of education on performing postpartum exercise based on health belief model. Med J Mashad Univ Med Sci 2014;57:776-87.
38. Khoshravesh V, Pourmohsen M, Khayyat S. Effects of stress management training on social adjustment of rasht hospitals female medical staff. J Rafsanjan Univ Med Sci 2015;14:235-44.