



Effects of education on exercise (physical activity) performance of pregnant women

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ABSTRACT

Pregnancy is an important period of life that may put them at risk of decreased physical activity and a large percentage of women have little knowledge about exercise during pregnancy, and their performance is not good. Therefore, the aim of this study was an evaluation the effects of education on exercise performance of pregnant women. This research was a semi-experimental study. 272 numbers of the nulliparas admitted to the eight health centers of Semnan, Iran selected by stratified-cluster sampling method and were placed in the intervention and control groups. Classes for the intervention group were held once every one week in the eight sessions and the duration of each session, was one hour. Collection of data was conducted through Godin and demographic questionnaires and in order to its analysis, SPSS software was used. The results of this experiment showed that the groups of intervention and control, were similar in terms of the demographic characteristics. Before the intervention, in terms of exercise performance, there was no significant difference between the intervention and control groups. After intervention level of physical activity was mild (53.7%) in the training group, and was in lack of activity range (99.3%) in the control group. Statistical analysis showed that there were significant difference in physical activity of intervention and control groups ($p = 0.000$). Therefore, the final results of this investigation showed that educational classes of pregnancy exercise had a positive effects on the performance of pregnant women.

Keywords: Education, Pregnant women, Physical activity, Intervention

INTRODUCTION

Pregnancy is an important period of life that may put them at risk of decreased physical activity [1]. Women who are pregnant and healthy are recommended to do 30 minutes or more of light to moderate exercise a day on most, if not all, days of the week [2]. Exercise during pregnancy is associated with reduced back pain [3] improved sleep [4] and improved health perception [5]. Only a few randomized controlled trials have examined the efficacy and safety of resistance training during pregnancy [5-6]. Although exercise programs during pregnancy after childbirth is designed to minimize impairment and helps the woman maintain or regain function while she is preparing for the arrival of the baby and then caring for the infant, it is submitted that women are not meeting the exercise recommendations of the previous studies [7].

A myriad of factors not limited to beliefs and attitudes of women with respect to exercise in pregnancy [8], level of knowledge [7], level of education [8], safety concern of the pregnant woman and her physician, race/ethnicity, and previous involvement in regular exercise have been implicated as important factors predisposing to exercise engagement or phobia among pregnant women [9]. It has been found from previous studies that subjects' characteristics such as age, level of education, and experience in infant and maternal issues significantly influence knowledge, attitude, and perceptions of mothers towards exercises [9]. It was found in this study that attitude

towards exercise in pregnancy was influenced mostly by tiredness, lack of feeling to exercise, and insufficient information on exercise. Similar findings have been reported by other authors [10].

Furthermore, knowledge about benefit and contraindication to antenatal exercise significantly influenced the attitude of the women towards exercise in pregnancy. There is ample and consistent evidence that promoting physical activity in women of reproductive age may be a promising approach for the prevention of excessive weight gain, gestational diabetes mellitus and subsequent complications suffered by children born from pregnancies [11]. This finding of previous reports revealed that there is significant association between adequate knowledge of antenatal exercises and attitudes toward exercise during pregnancy [12]. Historically, pregnancy was regarded as a state of confinement. More recently, however, research has demonstrated many potential health benefits of aerobic and strength-conditioning exercise in pregnancy and the postpartum period. It is now considered safe, and even advisable, for otherwise healthy pregnant women to initiate or continue an active lifestyle during pregnancy. Lack of exercise during pregnancy might result in loss of muscular and cardiovascular fitness, excessive maternal weight gain with a raised risk of GDM, varicose veins, dyspnea, lower-back pain and poor psychological adjustment [13].

Previous studies have reported that exercise during the second half of pregnancy could reduce the severity of lower back pain [14]. A study was carried out to evaluate a population of pregnant women and results suggest that the practice of water-based physical activity is beneficial to pregnant women, although it was not associated with any increase in quality of life [15]. Since pregnancy is an ideal time for behavior modification and for adopting a healthy lifestyle because of increased motivation and frequent access to medical supervision. Patients are more likely to control weight, increase physical activity, and improve their diet physician recommends that they do so. Therefore, motivation counseling tools have been used successfully for diet and exercise counseling [16]. Therefore, pregnancy is a good time to develop healthy lifestyle habits including regular exercise and good nutrition [8]. Therefore, based on the mentioned benefits of pregnant women's exercise, the objective of the present study was an investigation the effects of education on exercise performance of pregnant women who admitted to the health centers of Semnan, Iran.

MATERIALS AND METHODS

This study was a quasi-experimental intervention. Samples were 292 nulliparas women who admitted to the health care centers in Semnan, Iran for prenatal care receiving. Stratified cluster sampling method was used in this study, and samples were placed in the intervention and control groups. In this investigation, data were collected in two stages of pre and post of test. Questionnaires of pretest (Godin and demographic questionnaires) were completed before the start of classes for training and control samples. Pregnant women of training group were participated at the training classes in addition to receiving of the pregnancy period routine care. While the mothers who were in the control group, received only the routine care. Training classes were held for the two groups by the researcher and audio-visual equipment (TV, video, training videos and pamphlets) at the same time and location. Methods of training were lecture, discussion in small groups, question and answer, film screening (physical exercise) and educational booklet or pamphlet.

Classes were held in the form of the group at eight sessions at the premarital counseling center. Each session was held in the per week, and time for each session was 1-1.5 hours. The contents of educational classes (intervention) were in two sections: theoretical and practical: The theoretical section included: anatomy and function of the device, physical changes during pregnancy, Pregnancy and physical activity, benefits of exercise during pregnancy, Exercise Contraindications during pregnancy, Principles of exercise during pregnancy, the correct method of Doing exercise in pregnancy, Permissible exercises in pregnancy. The practical section included: stretching exercises during pregnancy and approved by the Ministry of Health and was carried out as a group based on the book of preparedness for childbirth. At the end of the training sessions as well as an educational booklet of pregnancy exercises prepared by the investigator, were approved by the professors of the Faculty of Nursing and Midwifery, Tehran University and were placed at the disposal of samples also they are able to do exercises at home properly. After 6 weeks of the end of the training, post-test questionnaire (Godin), was completed again for samples of training group and the control group. In the post-test, 10 number of samples in the intervention group (for the reasons: two of samples for the preterm birth, one number of samples for the hydrocephaly, one person for the IUFD, three of samples for the emigrating from Semnan city and three of samples due to the occupation) and 10 of samples in the control group (for the reasons: two of samples for the preeclampsia, two of samples for the preterm birth, three of samples for the emigrating from the Semnan city and four of samples for the non-recourse reason. Personal physical activity questionnaire was designed based on the Godin et al., [17] questionnaire.

The questionnaire of physical activity was divided into the three categories: mild, moderate, and vigorous and therefore, depending on the type of exercise, each of the physical activity, was placed in one of the three above

categories. For example, activities such as walking, yoga, archery, golf and an individual dance were placed in the category of mild activities. Activities such as brisk walking, badminton, bicycle riding, tennis, swimming style, volleyball, skiing and dance activities as a group were placed in the category of moderate activities and running, football, judo, karate, heavy swimming, tekvando, long-distance cycling were placed in the category of vigorous activities. In order to calculate the total score, there was a column entitled activities of during pregnancy in front of each activity and the frequency of performance of each activity that had been carried out during in one week for at least 15 minutes, was recorded, the total score of Godin total physical activity was calculated from the formula:

$$\text{Total score} = 9 (\text{high activity}) + 5 (\text{moderate activity}) + 3 (\text{mild activity})$$

According to the classification of Ainsworth *et al.*, [18], if a person performs two activity of the mild exercise category three times per week for at least 15 minutes. The activity level of her exercise was mild. If a person performs two activities of the mild exercise category, the activity level of her exercise was moderate. Moreover, if a person in the moderate exercise category, performed one activity of vigorous exercise category every day in addition to those mentioned in the moderate activity, her activity was vigorous. Therefore, if the total exercise score was less than 18, her level exercise was inactivity, if the exercise score was 19-77, her level exercise was as a mild exercise, if the exercise score was 78-181, her level exercise was as a moderate exercise, and if the exercise score was more than 182, her level exercise was as a high exercise. Samples of the training group and control group completed questionnaire and then, SPSS statistical software was used in order to analysis of the data.

RESULTS

The studied women in the groups of training and control, were similar in the demographic characteristics such as age, education, length of marriage, monthly income spouse's occupation and income, spouse's education, body mass index and information sources (mostly books). Results of this study showed that exercise level of the majority of the subjects in the groups of training (97.1%) and control (97.8%), before intervention were in the lack of activity level. In pre-test, in both groups (training and control) there was no significant difference ($p=0.5$) in exercise level. Results of after intervention showed that 47.3% of the samples in the intervention group and 99.3% in the control group were placed in the lack of physical activity level and 53.7% in the intervention group and 0.7% in the control group were placed in the mild physical activity level ($p=0.000$) (Table 3). Since despite of the randomized division of samples in two groups of the training and control, demographic variable of jobs was not homogenous in the two groups. Therefore, the researcher eliminated the influence of mentioned variable by the Mantel-Haenszel test. Mantel-Haenszel test results, did not show a significant correlation between physical activity and job ($p=0.65$) after training.

Table 1. Frequency distribution of demographic characteristics in control and training groups of pregnant women who admitted to the health centers of Semnan, Iran

Characteristics		Training group		Control group		Result of the test
		The number of woman	Percentage	The number of woman	Percentage	
Age	20<	113	9.6	10	7.4	P= 0.397
	20 -29	117	86	114	83.8	
	29>	6	4.4	12	8.8	
Education	Primary	6	4.4	4	2.9	P= 0.743
	Guidance	23	16.9	19	14	
	High school	71	52.2	71	52.2	
	Collegiate	36	26.5	42	30.9	
Body mass index (BMI)	19>	22	16.2	30	22.1	P= 0.583
	19.8-26	67	49.3	67	49.3	
	26-29	30	22.1	26	19.1	
	29>	17	12.5	13	9.6	
Gestational age	18-20	73	53.7	68	50	P= 0.302
	20-22	24	17.6	18	13.2	
	22-24	39	28.7	50	36.8	
Voluntary pregnancy	Voluntary	128	94.1	125	91.9	P= 0.475
	Involuntary	8	5.9	11	8.1	

Table 2. Absolute and relative frequency distribution of activity level before the intervention in control and training groups of pregnant women who admitted to the health centers of Semnan, Iran

Groups Frequency	Training group		Control group		Statistical test
	The number of woman	Percentage	The number of woman	Percentage	
Exercise level					
Inactivity 0-18	132	97.1	133	97.8	$\chi^2= 0.147$ df=1 p=0.5
Mild 19-77	4	2.9	3	2.2	
Total	136	100	136	100	
Average	1.029		1.022		
Standard deviation	0.169		0.147		

Table 3. Absolute and relative frequency distribution of activity level after the intervention in control and training groups of pregnant women who admitted to the health centers of Semnan, Iran

Groups Frequency	Training group		Control group		Statistical test
	The number of woman	Percentage	The number of woman	Percentage	
Exercise levels					
Inactivity 0-18	62	45.3	135	99.3	$\chi^2= 96.236$ df=1 p=0.000
Mild 19-77	74	53.7	1	0.7	
Total	136	100	136	100	
Average	1.544		1.007		
Standard deviation	0.499		0.857		

DISCUSSIONAND CONCLUSION

Findings of this research indicated that training is one of the factors in improving of exercise in pregnant women. The present findings are also in agreement with studies, reporting that subjects' characteristics such as age, level of education, and experience in infant and maternal issues significantly influence knowledge, attitude, and perceptions of mothers towards exercises [9]. In study of Rebecca et al., [18] the educational intervention improved exercise performance in pregnant women. Liu et al., [19] in one study in order to evaluation of the education on changes of exercise performance score in pregnant women reported that exercise performance score in the intervention group was significantly higher than the control groups ($p < 0.05$).

Hegaard et al., [20] have shown, training classes by modifying health behaviors during pregnancy, improve physical activity, mental health and reduce anxiety in pregnant women. However, results of Totten et al., [21] is in contrast with the results of this research. So that in this research reduction in the amount of physical activity of the samples was observed after participating in the educational programs. Because the type of instrument was used to measure the amount of physical activity in two studies was different and intensity of physical activity has not been measured in his study also in his study physical activity in the most cases was more than the 30-59 minutes per day at the start of classes and a reduction in the amount of physical activity was probably due to the increasing of women size with gestational age progression, complaints and fatigue caused by the pregnancy. While the physical activity level for the majority of the cases before the training, was as the inactivity.

The results of this study showed that trainings and pregnancy classes had a positive effect on the exercise performance and improved these activities. One of the inhibitors of exercise during the pregnancy is cultural beliefs. Many of the women enjoy from the exercise and they would like to continue it during the pregnancy. On the other hand, poor knowledge about the correct methods of exercise and the benefits of exercise during pregnancy and wrong beliefs about this note. Exercise can cause a damage to the both mother and fetus and therefore, causing a lack of appropriate physical activity. So staying healthy of both mother and fetus requires awareness about type and method of doing of exercise in pregnancy [22]. Therefore, providing the essential training and emphasis on the benefits of exercise, decreases the worry of women about probable adverse effects on the fetus exercise and also with emphasis on this fact that specific exercise during pregnancy with preparation of the pelvic floor muscles and the abdominal, prepares the mother to the easier vaginal delivery and without damage to the fetus. That can improve mothers' performance for having physical activity.

REFERENCES

- [1] American College of Obstetricians and Gynecologists Exercise during pregnancy and the postpartum period, ACOG. Committee Opinion 267. *Obstet. Gynecol.* 2002; 99: 171-173.
- [2] PetrovFieril K, FagevikOlse'n M, Glantz A, Larsson M. Experiences of exercise during pregnancy among women who perform regular resistance training: a qualitative study, *PhysTher*, 2014; 94(8):1135-1143.
- [3] Garshasbi A, Faghih Zadeh S. The effect of exercise on the intensity of low back pain in pregnant women. *Int J Gynaecol Obstet.* 2005; 88: 271–275.
- [4] Youngstedt SD. Effects of exercise on sleep. *Clin Sports Med.* 2005; 24: 355–365.
- [5] Barakat R, Pelaez M, Montejó R, Luaces M, Zakythinaki M. Exercise during pregnancy improves maternal health perception: a randomized controlled trial *Am J Obstet Gynecol.* 2011; 204(5): 402.e1–7.
- [6] De Barros MC, Lopes MA, Francisco RP, Sapienza AD, Zugaib M. Resistance exercise and glycemic control in women with gestational diabetes mellitus. *Am J Obstet Gynecol.* 2010; 203(6): 556.e551–6.
- [7] Evenson KR, Moos M, Carrier K, Siega-Riz AM. Perceived barriers to physical activity among pregnant women. *Matern Child Health J.* 2009; 13(3): 364–375.
- [8] Ribeiro CP, Milanez H, Knowledge, attitude and practice of women in Campinas, São Paulo, Brazil with respect to physical exercise in pregnancy: a descriptive study. *Repr Health.* 2011; 8(1):page 31.
- [9] Mbada CE, Adebayo OE, Adeyemi AB, O.O. Arije OO, Dada OO, et al., Knowledge and Attitude of Nigerian Pregnant Women towards Antenatal Exercise: A Cross-Sectional Survey. *ISRN Obstet Gynecol.*2014; 1-8.
- [10] Cioffi J, Schmied V, Dahlen H, MillsA, Thornton C, et al., Physical activity inpregnancy: women's perceptions, practices, and influencing factors. *J Midwifery Wom Health.* 2010; 55(5): 455–461.
- [11] Ferraro Z, Rutherford J, Keely EJ, Dubois L, Adamo KB. An assessment of patient information channels and knowledge of physical activity and nutrition during pregnancy. *Obstet Med.* 2011; 4: 59-65.
- [12] Abedzadeh M, Saberi F, Sadat Z. Exercise during pregnancy and postpartum Kashan, Morsal Publ. 2005. (In Persian)
- [13] Mukona D, Munjanja SP, Zvinavashe M, Stray-Pederson B. Physical activity in pregnant women in Africa: A systematic review. *Int. J. Nurs. Midwifery.* 2016; 8(4): 28-34.
- [14] Kashanian M, Akbari Z, Alizadeh MH. The effect of exercise on back pain and lordosis in pregnant women *Int. J Gynecol Obstet.* 2009; 107(2): 160-61.
- [15] Vallim AL, Osis MJ, Cecatti JG, Baciuk EP, Silveira C, et al., Water exercises and quality of life during pregnancy. *Reprod Health.* 2011; 8(14).
- [16] Committee on obstetric practice, Physical activity and exercise during pregnancy and the postpartum period. The American College of Obstetricians and Gynecologists, *Wom Health Care Physicians.* 2015; 650.
- [17] Godin G, Jobin J, Bouillon J, Assessment of leisure time exercise behavior by self-report: A concurrent validity study. *Can J Public Health.* 1986; 77: 359-361.
- [18] Jackson RA, Stotland NE, Caughey AB, Gerbert B, Improving diet and exercise in pregnancy with Video Doctor counseling: A randomized trial. *Patient EducCouns.* 2011; 83: 203-209.
- [19] Liu N, Mao L, Sun X, Liu L, Yao P, The effect of health and nutrition education intervention on women's postpartum beliefs and practices: a randomized controlled trial. *BMC Public Health.* 2009; 9(45).
- [20] Hegaard HK, Damm P, Nielsen BB, Pedersen BK, Pregnancy and recreational physical activity. *UgeskrLaeger.* 2006; 168(6): 564-6.
- [21] Totten S, Steel O, Conner K, Jeswiet P, Macrae K, Evaluation of the KFL&A Health Unit Prenatal Education Program. *Public Health.* 2003.
- [22] Dabiran S, Hatmi S, The new approach to exercise during pregnancy Tehran University of Medical Sciences. *Tehran Univ Med J.* 2005; 63(12): 974-979.