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Original Article

Effects of Aerobic Exercises on Antenatal Depression in Pregnant Women

Amina Riaz[1*], Iqra Abdul Ghafoor[2], Nimra Fazal[3], Amna Shahid[2], Amara Anwar[4], Sadia Sukhera[5] and Muhammad Faizan Hamid[6]

[1]Department of Physiotherapy, Noor Hospital, Kot Radha Kishan, Lahore, Pakistan
[2]Riphah College of Rehabilitation Sciences, Riphah International University, Lahore, Pakistan
[3]Superior College Rahim Yar Khan, Pakistan
[4]Alshifa Institute of Health Sciences of Narowal, Narowal, Pakistan
[5]Quaid e Azam University, Sahiwal, Pakistan
[6]University of South Asia, Cantt campus, Lahore, Pakistan

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***Corresponding Author:**

Amina Riaz,
Department of Physiotherapy, Noor Hospital, Kot Radha Kishan, Pakistan
biostats1000@gmail.com

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ABSTRACT

Pregnancy is a distinctive period in the life of all women. The routine of a pregnant woman has a substantial impact on her and her fetus. Consistent physical activity is one of the best factors that help maintain normal mental and physical well-being. Antenatal depression is not uncommon and is associated with a greater risk of negative pregnancy outcomes. **Objective:** To determine the effects of aerobic exercises on antenatal depression in pregnant women. **Methods:** A total of 30 participants are included in this study. The exercise group regularly attended supervised sessions for 8 weeks. The activities in each session included walking, aerobic exercise, stretching, and relaxation. Aerobic activities were prescribed at moderate-to-vigorous intensity. However, the benefits of supervised exercise and its effects on health status were discussed. The Center for Epidemiological Studies Depression Scale was used to assess depression symptoms at the first interview and immediately after the 8th week of the treatment protocol. *Shapiro-Wilk test* was used to check the normality of data. **Results:** The exercise group showed significantly improved depressive symptoms as measured with the CES-D after the 8th week of intervention on the CES-D. The participants demonstrated a significant improvement in depressive symptoms from standard to intervention completion. Paired sample *t-test* was used to check pre and post-treatment effectiveness and less than 0.05 p-value of paired sample *t-test* tells us that there is a significant change in pre and post-treatment. **Conclusions:** Aerobic exercises during pregnancy led to a significant reduction of depressive symptoms.

INTRODUCTION

Pregnancy is the distinctive stage in the life of all women. The standard of living for an expecting female takes a considerable influence on that woman and her child's well-being —. Depressive disorders have become a well-known fitness problem around the whole world. The global incidence of depression has been expected at 10.4%. During pregnancy, depression is most common in females with earlier history of unhappiness otherwise the family history of despair, those in single parenthood or with more than three to four children, cigar smokers, low-income people, teenage girls, and women as well as unfavorable social situation . The frequency of depressive indications and concomitant substance use in these residents is a chief public health issue. About 20% of pregnant women suffer from prenatal depression, which not only has harmful possessions on the woman and her child but also increase the developing rate of post-delivery depression. The indications of depression during pregnancy are no different from depression at any other time. However antenatal depression may go un-diagnosed due to the attention paid to parental and child well-being and credit of the disorder to the bodily and hormonal fluctuations related with gravidity. The danger factors are contained such as a history of despair, absence of companion,

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complications in marital status, lack of community funding, family forcefulness, depressing lifestyle, substance abuse, history of miscarriages, unintentional pregnancies, uncertainty towards pregnancy and tension about the baby [4]. Daily workouts play an important role on physical and psychological health. Harmful significances of lack of activity may be a vital problem in pregnant females. Up to sixty percent females are inactive during pregnancy'. The potential mechanism behind the effect of exercises is that the stimulation of pressure receptors during exercises that increase the vagal activity and resulting the decrease cortisol, increase serotonin, and decrease Substance P and ultimately decrease the pain. The decrease in cortisol is mostly important because cortisol adversely effect on immune functions and is important predictor of prematurity. Mediations designed for the prevention of post-delivery depression contain psychotherapy, postpartum investigation, educational and reassuring measures provided by midwives, along with anti-depressant medicine, nutritive plans, exercises, acupuncture and massage or yoga . The ordinary managements for despair can be helpful in expecting women with the exclusion of few anti-depressant drugs. The helpful therapy such as regular exercises, proper diet, acceptable sleep and family along with friends support are indicated . Regular workout decrease the incidence rate of gestational diabetes-mellitus, gestational hypertension and preeclampsia. Suggestion is available and designed for the part of exercises in prevention of in-continence during period of pregnancy as well as postnatal. Daily physical activity has been shows to reduction of extreme gestational weight increase, which is a significant factor of many harmful motherly consequences. Physical activity makes a woman feel more energetic and powerful (98%) and improved her labor and delivery time period (89%) . Exercises was earlier described to relieve major depressive disorder symptoms and it is frequently the first suggested routine alteration to diminish the disease and mortality. The study hypothesized that daily workout may progress the prenatal depression . The goal of our study was to determine the effects of aerobic exercises on antenatal depression in pregnant women.

METHODS

Data was collected from Physiotherapy Department in Noor Hospital Kot Radha Kishan. The study was completed within the time of 10 months. Convenient sampling considering the population size of Noor Hospital KRK was used. During the whole period of study, the ethics was kept in consideration. The personal information of individuals was kept hidden and secured. Individuals having 20 to 35 years age were included. Primigravida and multigravida were also taken into consideration. The exclusion criteria for this study is that the contributors having chronic medical conditions like as: CVS disease, any psychological disorders, Chances of pre-term labor, uncontrolled thyroid disorder and incompetent cervix. Zero for answers of 1st line, one for answers of 2nd line, two for answers of 3rd line, and three for answers of 4th line. The scoring of positive items is inverted. Possible range of scores is 0-60 with largest score representing the incidence of major symptomatology. According to Korean description of the CES-D has adequate test/retest reliability (0.68 over several weeks). The internal consistency (0.89–0.93), and concurrent validity and requires approximately 4 to 5 minutes to complete. Scores range from 0 (lowest) to 60 (highest) and participants are categorized into one of the following four groups:

No depression	0 to 9
Mild	10 to 15
Moderate	16 to 24
Severe	More than 25

Table 1: scoring for depression

Treatment Approach: Center for Epidemiologic Studies Depression Scale (CES-D)was helping to check the depressive indications. All participants were fill the CES-D questionnaire on day 1 as pretreatment values and at the end of 8th session as post treatment values respectively. All participants repeatedly attended administered workout sessions for 8 weeks and three classes of 60-minute exercise classes each week and started at the 16 to 27 weeks of gestational age.

1. Warm up for 10 min
2. Aerobic exercises for 30 min like as step aerobics (low step level) and walking
3. Muscles Stretching exercise for 10 min like as Kegel exercise, pelvic-curl exercise, tailor-press exercise, and back bridging
4. Relaxation Exercise (10 minute) like as shoulder-circles

Aerobic activities were recommended at moderate-to-vigorous intensity. The accompanied sessions were supervised under the supervision of Physiotherapist and was conducted in a well-ventilated rehabilitation room in small groups. In these sessions, the benefit of exercises and the effects on health-status was conversed. The symptoms of depression were checked of overall participants with the help of CES-D in 1st training session and after the 8th week interventions.

Data Collection Procedure:

During 1st visit of the patients these steps were taken:

1. A complete physical examination, history and

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thoroughly assessment was done by researcher.
2. The patient was complete CES-D Scale as subjective measurement.
3. Treatment was continued to the selected subject according to their allocation.

In next visits:

1. Patient was reassessed by researcher.
2. Three sessions of treatment per week was given. Post treatment readings was taken at the end of 8th week.
3. 08 weeks was done for total treatment sessions. Data was analyzed on SPSS 25. Significance p=0.05. *Shapiro-Wilk-test* was used to check the research data normality from a normal dissemination and parametric tests of analysis was used.

RESULTS

In this Quasi experimental study, females who matched the inclusion criteria and willing to participate in this research were included. Results showed that there were 30% females in age group of 20-25 years, 43.3% in age group of 26-30 years and remaining in age group of 31-50 years. Most of the females were multigravida which is above 50%. CES-D was applied on all participants before treatment and check the results, which shows that our participants had moderate to severe depression. After that treatment was started as per protocol, which consisted of warm up, aerobics, resistance and stretching exercises. Post treatment results significantly showed improvement in participant's depression score. As there is only one group of participants, so paired-sample t-test was applied to check pre and post treatment effectiveness and their statistical significance, and the less than 0.05 p-value of paired sample t-test tells us that there is a significant change in pre and post treatment. So, on that bases we rejected our null hypothesis. Table 1 of normality shows that our data was normally distributed because p-value was more than 0.05, which was expected to be normal. The table of gravidity shows that around 19 females was multigravida and 11 was primigravida (Table 2). Descriptive statistics of before intervention CES-D shows that 2 females, had no depression 5 had mild, 20 had moderate and remaining 3 had severe depression (Table 3). Descriptive statistics of post intervention shows that 7 was not depressed, 17 had mild depression and 6 had moderate depression (Table 4).

Variables	Statistics	Sig.
Age	.894	0.06
Gravidity	.353	0.638
Parity	.337	0.647
Pre-CESD	.377	0.765
Post CE-SD	.287	0.798

Table 1: Test of Normality

Gravity	Frequenc	Percentag
Multigravid	19	63.3
Primigravid	11	36.7
Total	30	100

Table 2: Descriptive statistics of Gravidity

Scoring of CES -D	Frequency	Percentage
0-9 (not Depressed)	2	6.7
10-15 (Mild Depression)	5	16.
15-20 (Mod Depression)	20	66.7
>25 (Severe Depression)	3	10
Total	30	100

Table 3: Descriptive statistics of Pre intervention CES-D

Scoring of CES -D	Frequency	Percentage
0-9 (not Depressed)	7	23.3
10-15 (Mild Depression)	17	56.7
15-20 (Mod Depression)	6	20
Total	30	100

Table 4: Descriptive statistics of post intervention CES-D

The statistical analysis shows that the mean of pre-treatment was 1.80± 0.714 and post treatment was 0.97 ± 0.669, which gives the p value in pre-treatment was more than 0.05 which was not statistically different but in post treatment as there was a difference in mean score so p-value gives us the significant result (Table 5). Overall Depression Scores and Severities in Pre & Post Intervention is shown in table 6. Overall Demographic Data is shown in table 7.

CES-D	Mean ± SD	Df	t-value	P value
Pre-Treatment	1.80± 0.714	29	7.04	0.00
Post Treatment	0.97 ± 0.669			

Table 5: Paired sample t test of CES-D score

PRE-INTERVENTION OF CES-D		POST INTERVENTION OF CES-D	
Depression (mean± SD)	1.80± 0.714	Depression (mean± SD)	0.97 ± 0.669
Not depressed	2 (6.7%)	Not depressed	7 (23.3%)
Mild depressed	5 (16%)	Mild depressed	17 (56.7%)
Moderate depressed	20(66.7%)	Moderate depressed	6(20%)
Severe depressed	3 (10%)	Severe depressed	0 (0%)

Table 6: Overall Depression Scores and Severities in Pre & Post Intervention

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Variables		Frequency	Percentage
Age	20-25 years	9	30.00%
	26-30 years	13	43.3%
	31-35 years	8	36.7%
	Total	30	100%
Gravidity	Multigravida	19	63.3%
	Primigravida	11	36.7%
	Total	30	100%
Parity	P0	12	40.00%
	P1	2	6.7%
	P2	4	13.3%
	P3	5	23.3%
	P4	7	16.7%
	Total	30	100%
Employment	Employed	15	50%
	Unemployed	15	50%
	Total	30	100%

Table 7: Overall Demographic Data

DISCUSSION

The research was initiated to investigate the properties of aerobic physical activity on antenatal depression. Exercise is a powerful tool for management of extreme gestational weight-gain and associated difficulties and an interpretation that is well maintained in the present study. In this research we find the considerable suggestion for positive properties of exercise during a healthy gravidity. A previous study was conducted by Mervat M El-Rafie *et al.*, in 2016, in which they exploring the effect of exercise in preventing and treating antenatal depression. The participants were divided into two groups, n=50 in the exercise group and n=50 in the control group. The exercise group regularly attended supervised sessions for 12 weeks. After 12 weeks the exercise group had a significantly lower depressive symptom score than the control group (P<0.001)[10]. The conclusion of the current is similar to this study, both were showed the significant results of aerobic exercises during antenatal period for reduction of depression. This systematic review conducted by AJ Daley *et al.*, in which they establish a sufficient evidence to conclude that exercise is an effective intervention for preventing and treating antenatal depression. Six trials were eligible for inclusion. Meta-analysis showed a significant reduction in depression scores $P = 0.03$ in exercise group relative to control group. The test for subgroup differences in women who were non-depressed (one trial) ($P = 0.002$) and depressed (five trials) ($P = 0.09$). The test for subgroup differences between aerobic (one trial) and non-aerobic exercise (five trials) was also non-significant ($P = 0.32$) [12]. The review showed that the results of this study were similar with the current study. During pregnancy, the natural increase in energy depletion and outflow even in the inactive state. Therefore the conventional methods of determining physical activity like heart rate discrepancy otherwise kcal/kg may not internment exercise outflow in the same way as in non-expecting women [13]. Antenatal depression were significantly connected with postnatal depression and poor perinatal consequences [14]. Anhelo Fernando Robledo-Colonia *et al.*, study the results of supervised aerobic exercise during pregnancy reduce depressive symptoms in nulliparous women. The experimental group completed a 3-month supervised exercise program, commencing at 16 to 20 weeks of gestation. Each session included walking (10 min), aerobic exercise (30 min), stretching (10 min), and relaxation (10 min). The control group continued usual activities and performed no specific exercise. They used the unpaired *t-test* to estimate the between-group difference. The significance level was set at $p < 0.05$ [2]. The results of this study go in accordance with the current study as it shows significant difference ($p<0.05$). Exercises is a process of stress reduction in pregnancy and it is not connected with adverse fetal consequence and exercises during pregnancy may provide benefit to mother and fetus as well [15]. Goodwin et al create investigating that the exercise training in nulliparous patients had developed psychological well-being score with developments in somatic, nervousness and in insomnia as compared to control cluster[16]. During pregnancy, the symptoms are an imperative provider factor to poor health-status while in the post-delivery period the deficiency of community support is the most constant predictor of poor-health outcomes [17]. Antenatal depression can harmfully affect the physical and intellectual health of both mother and fetus[18]. In previous study, the opinions appear to be strongly supported by Medical physicians and find that over half the candidates were knowledge-able on the function of exercise in improving CVS capability, strength power, sleeping forms and reducing the hazard of gestational diabetes mellitus [8]. According to another previous study is that the effects of participation in a 8th week aerobic exercise program on pregnant adolescents have a significant reduction of depression over the time and an increase in total self-esteem [19]. There was a statistically major inverse association between amount of exercise and discomforts described in 3rd trimester. These findings recommend that exercise during pregnancy is associated with developed self-esteem and lower discomfort scores [20]. A study conducted by Sylvia Marquez-Sterling *et al.*, showed no significant differences between exercise and control groups in physical characteristics initially. A repeated measures ANOVA showed a significant group effect (P-value < 0.05)[21]. Overall, the results of this study show that

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women who is exercised took statistically substantial larger self-esteem and lower physical-discomfort scores than women who did not done daily workout. Daily physical activity has been shows to reduction of excessive gestational weight-gain, which is a vital factor of many harmful motherly outcomes. The obtainable results show that the physical dormancy between pregnancies is linked with severe mood swings specially the females who were physically energetic between their 3rd trimester was found to be less concerned than inactive females. The results expose that significance and cost-effectiveness of administrated exercises during gravidity is improved prenatal mood variations, as well as its other health benefits.

CONCLUSION

It is concluded that aerobic exercises during pregnancy led to a significant reduction of depressive symptoms. Daily physical activity has been shows to reduction of excessive gestational weight-gain, which is a vital factor of many harmful motherly outcomes. In this study, women who do exercise took statistically substantial larger self-esteem and lower physical-discomfort scores than women who did not done daily workout.

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