DOI: https://doi.org/10.53350/pjmhs02023171127

ORIGINAL ARTICLE

Comparison of Aerobic and Pilates Exercises on Depression and Sleep Quality in Primigravida Females

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ABSTRACT

Aim: To compare effects of Aerobics and Pilates exercises on depression and sleep quality in primigravida females.
Methods: The study was randomized clinical trial and was conducted in children hospital and Mehmooda Hospital Sheikhupura. This study completed in 10 months and convenience sampling technique was used. Total thirty-eight subjects were assigned randomly by using lottery method into two groups. Group A and B received Aerobics and Pilate exercises respectively. Data was collected from all participants at baseline and after 8 weeks of treatment by using CES-D and PSQI questionnaire. After checking the normality of data as p value was greater than 0.05 it was analyzed by using parametric test (independent T test and paired sample T-test) by using SPSS-25.
Results: The result of the study showed that in group analysis, improvement in CES-D scale and PSQI were observed in both groups as p value was significant p<0.05.But between the groups significant improvement was seen in CES-D and Quality of Sleep in Pilates training group as p<0.05.
Implication: Research on incorporating aerobic exercises during antenatal periods for pregnant women is recommended, with proper follow-up and long-term groupings to ensure treatment efficacy preservation.
Conclusion: It was concluded that Aerobics and Pilates exercise training both had significant effects in treating the symptoms of depression and in improving the quality of sleep in antenatal primigravida females.
Keywords: Aerobic exercises, Antenatal depression, Pilates exercises, Primigravida females, Sleep quality.

INTRODUCTION

For all women[1], being pregnant is a significant life step. An expectant mother's quality of life has a significant effect on the health of her unborn child as well[2]. All around the world, depressive illnesses are now a frequent issue. 10.4% is predicted to be the global prevalence of depression[3]. Depression during pregnancy is most common in women with a history of beginning melancholy[4] or a familial history of hopelessness, in single parents or those raising more than three or four children, in chain smokers, in low-income individuals, in teenage girls and women, and in unfavourable social situations. Organisation for World Health (WHO). Sadness is a major indicator when it lasts for at least two weeks and is accompanied by feelings of exhaustion, loss of energy, and discontent[5]. Depression can also be accompanied by anxiety, poor sleep, eating disorders, attention deficits, regret, low self-esteem, or unpleasant thoughts[6]. Pilates is regarded as a key workout for enhancing one's physical, mental, and motor abilities[7] Pregnancy-related diaphragmatic breathing exercises with Pilates help the woman get ready for labour[8]. Despite amazing advancements in obstetrics, managing labour pain—an inevitable part of childbirth—remains one of the most obstacles to women's health. Conversely, prolonged labour is a problem in modern midwifery that leads to a number of complications for the mother and the child[9].These include increased maternal fatigue, the need for an induction, a surgical birth or an instrumental delivery, a lack of uterine contraction, a high mother mortality rate, increased foetal distress, low oxygenation, a low Apgar score and ultimately, intrauterine death[10].

There are benefits to regular, moderate physical activity for a healthy pregnancy that last throughout labour and after delivery. The pain and effort involved in giving birth decrease as the impacted area's muscles strengthen during labour[11]. Physical activity is getting more and more popular among women who are fertile[12]. Many women ask their doctors for advice on whether or not to exercise while pregnant. The more pregnant women who wish to participate in sports, the more often the topic of discussion revolves around the benefits of exercise for both the mother and the foetus. However, when the physiological and physical mechanisms and processes of gestation started to be recognised, the guidelines for women for the kind of appropriate physical activity during the prenatal period became increasingly detailed[13]. The aim of this study was to explore the effects of aerobic and Pilates exercises in pregnant ladies. This may facilitate the adoption of a more active lifestyle, and mental health in pregnantfemales.Currentstudycontributedtotheexpandingbodyofknowledgeregarding which alter native therapy option should be used if these two procedures produce equivalent results and if one strategy is superior to the other. Therefore, the study was done to compare the effects of aerobic exercises and pilates exercises on depression and sleep quality in primigravida females**.**

Received on 21-07-2023
Accepted on 12-11-2023

MATERIALSANDMETHODS

Study Design: This study was a randomized clinical trial Trial registration number: NCT05811429. The sample size was calculated by EPI tool using a variable depression through CES-D scale in previous research (5). Sample size for comparing two Means Input data Confidence interval (2-sided) 95% Power 80% Ratio of sample size (Group2/Group1).
Sampling Technique: Non probability convenience sampling technique Children Hospital Sheikhupura and Mahmooda Hospital Sheikhupura. Data was collected within 10 months from approval date of synopsis. Age between18-35 years[14], Initial pregnancy (primigravida), One-parent pregnancy, Gestational week: 26 weeks to 32 weeks, Depressive females (The CES-D scale's cutoff point of 16 was utilised to identify women as sad). Gestational diabetes, Pregnancy Hypertension, Placenta Previa, Any previous miscarriage history, Medically prohibited to do exercise, Incompetent cervix, Polyhydramnios, Oligohydramnios, Any other psychological issue. The Center for Epidemiologic Studies Depression Scale (CES-D Scale). The Pittsburgh Sleep Quality Index (PSQI). The Center for Epidemiologic Studies Depression Scale (CES-D Scale)[15]. The Center for Epidemiologic Studies Depression Scale (CES-D Scale) was created for use in research

on the prevalence of sadness disorders in the larger public size. The CES-Dhas adequate test/retest reliability, according to a Korean report (0.68 over numerous weeks). It takes about four to five minutes to finish the concurrent validity and internal consistency (0.89-0.93) tests. The studies presented use da20-item scale with a possible core range of zero to 60; higher scores indicate a greater number of symptoms and are weighted by how frequently they occurred in the previous week.(45). The Pittsburgh Sleep Quality Index (PSQI)[16]. The Pittsburgh Sleep Quality Index (PSQI) was used to calculate quality of sleep. The PSQI is composed of 24 items or questions to be scored (0–3, for 20 items; four of them are open-ended), 19 of which are reported by oneself, and 5 of which call for second-hand assessment from a friend or roommate. The total score, also known as the global score (range:0to21), is obtained by adding the scores for each component. The reliability of the PSQI obtained a Cronbach's alpha coefficient of 0.77 in Iranian research (46).Data Collection Procedure: The participants were made aware of the goal and methodology of the study before it began. Each of them agreed to participate in the experiment and submit their private information for scientific processing by signing an informed consent form. This was done to ensure that all research was done in compliance with all applicable rules and laws. Randomization: Randomization was done through lottery method. Blindness The researcher who evaluated the participants were not informed of the group assignments of the participants. Participants were informed that they would receive one of two interventions without specifying which group would receive the same or different intervention.

RESULTS

The results of demographic data of mean and standard deviation of participant's age of Group A that was 25.21±2.91 with the minimum age 19 and maximum age 29. Similarly, the mean and S.D of Group B participant's age was 24.68±3.23 with minimum and maximum age 18 and 30 correspondingly. The mean and standard deviation of gestational weeks of Group A was 27.15±1.50 and of Group B was 27.68±1.66 respectively. Categories of BMI showed that 31.6% were normal BMI,57.9% were overweight and 10.5% females were obese in group A.52.6% were normal BMI,42.1% were overweight and 5.3% females were obese in group B. The normality of data was analyzed by using the Shapiro-Walk test while comparing variables having significant p-values p>0.05 and parametric tests i.e. Paired sample T test and Independent T test were used to analyze the data. The independent T test that was applied to check the difference between groups. Independent sample t test showed that there was significant difference was present in CES-D (depression) and quality of a sleep as p<0.05. Paired sample t-test that was applied to analyze the difference within group. In Group A (Aerobic training) the mean and standard deviation of CES-D pre and post-treatment was 33.57±6.21 and 22.89±4.49 respectively. Similarly mean and standard deviation for pre and post treatment PSQI was 17.21±2.07 and 9.36±1.92 respectively. The p value of the test within the subject effect was 0.00 which is less than selected alpha value 0.05, which shows that there was significant improvement in group A participant. In Pilates training group B the mean and Std. deviation for CES-D and before and after treatment was 35.94±6.98 and20.36 ±3.89 respectively. Mean and SD for PSQI (Quality of Sleep) pre and post interventional group was 17.31±2.21 and 4.78±1.58 separately. And the p value of the test within the subject was less than0.05 which showed the significant improvement in group B participants.

Table 1: Across and within-group comparison of CES-D, PSQISCALE

Baseline character	**Group A (aerobic exercises)**		**Group B (pilates exercises)**	
	Age of participants	**Gestational weeks of participants**	**Age of participants**	**Gestational weeks of participants**
No. of participants	19	19	19	19
Gender	Male		Female	
Mean age	25.21 ± 2.91	27.15 ± 1.50	24.68 ± 3.23	27.68 ± 1.66

Table 2: The Pittsburgh Sleep Quality Index within-group comparison

	Group A (Mean±S.D)	**Group B (Mean±S.D)**	**Mean Difference**	**P-value**
Pre-CES-D Scale	33.57±6.21	35.94±6.98	-2.36	0.27
Post CESD-Scale	21.52±6.23	13.84±3.20	7.68	0.00
Mean Difference	-2.36	7.68		
P-value	0.27	0.00		
Pre Global PSQI Score	17.21±2.07	17.31±2.21	-0.10	0.88
Post Global PSQI Score	9.36±1.92	4.78±1.58	4.57	0.00
Mean Difference	-0.10	4.57		
P-value	0.88	0.00		

DISCUSSION

Current study discussed about the comparative effects of Aerobic and Pilates exercises on depression and sleep quality in primigravida females.38 primigravida females were added in the current research having depression and disturbed sleep ,19 of them were included in Aerobic exercise training and 19 were included in Pilates exercise training. For within group analysis, improvement in CES-D Scale and quality of Sleep was observed. Between group analysis, significant improvement was observed in CES-D Scale and scoring of PSQI(p<0.05).In 2022, Riaz A et al. conducted the study that was focused on the effects of aerobic exercise on prenatal depression. Exercise was a potent technique for managing extremely high prenatal weight gain and its challenges, and the current study effectively supports this perspective[17]. Current study found strong evidence in this research supporting the benefits of aerobic activity during a healthy pregnancy. In 2020, Kalmbach DA et al. Studies show that antenatal stress and depression are linked to poor sleep throughout pregnancy. With growing parental and gestational ages, the quality of sleep declines. A 267 pregnant women experimental investigation indicated that from the second part of their pregnancy on, expecting women experienced greater levels of sleeplessness, nighttime introspection sadness, and suicidal thoughts. As the pregnancy goes on, the quality of sleep declines, getting even worse in the third trimester. Additionally, as people age, their sleep quality degrades. In one study, it was discovered that expectant women over the age of 30 had worse sleep than expectant women under the age of 30. The likelihood of high stress levels and depressed symptoms among pregnant women over the age of 30 is considerably higher, which may raise the chance of depression after childbirth. The Pittsburgh/Pittsburgh Sleep Quality Index (PSQI), according to the current review, is the tool used to measure sleep quality most commonly. However, the previously established cutoff score for the categorization of bad sleep quality may need to be adjusted for the expecting population, and a higher score may be required to distinguish between those who need additional evaluation and treatment. It is more difficult to predict what expectant women might anticipate in terms of the need for further revaluation and therapy due to the physiologic

alterations of pregnancy that make it difficultto sleep. Previous study was compared with current study, pregnant women experienced stress and depression due to this sleep quality was disturbed in antenatal period and quality of sleep is evaluated through PSQI Scoring before and after the treatment. Previous study show similar effect with current study that sleep quality was disturbed in antenatal period and we assessed through PSQI scoring[18]. The study's findings are compared to those of this one in that both found that aerobic activity during pregnancy significantly reduced depression and in current study 8 week training program was given the pregnant ladies and (P< 0.05). In 2019, Dieb AS et al reported case study, women who followed Pilates sessions had a lower incidence of haemorrhage during delivery (13.3% of the total) than those who only participated in the regular prenatal training (86.7%), with an incidence of 16.7% and 54.2%, correspondingly(19).These findings support investigations into perineal trauma-reducing therapies like those León-Larios and Dieb describe, which involve PF training programmes. According to the earlier study, trauma affects 17.6% of women who did not adhere to the programme, as opposed to 6.9% of those who did. In the later trial, trauma was experienced by 13.5% of the expectant women who received the PF training, compared to 21.5% of those who did not. Whatever the scenario, there is a research to indicate that Pilates, which concentrates muscular activity on the lower abdomen and PF, could be a tool to consider as part of physical training regimens for childbirth. This study shows similar results with the current study that Pilates are important for antenatal period. In 2019, Coll CdVN et al[20] contrast, that there was no impact of exercising throughout pregnancy on depression after childbirth, according to three randomised controlled trials. In two of these RCTs, one 1 h session per week was evaluated by Songoygard et al., and three 1 h sessions each week by Coll et al., to determine the effects of supervised aerobic activity with a varying amount of sessions each week. However, Mohammadi et al. Only looked at the impact of suggesting three 20–30 minute workouts each week. These various studies' findings about the various effects of exercise during gestation period on depressive symptoms following delivery may be explained by variations in the length of time, intensity, and frequency of the workout as well as whether the activity was under supervision or was just advised. According to a systematic analysis, expectant women required to accrue at least 644 MET-min/week in order to reduce their depressive symptoms. The advised level of activity was met by our treatment group, which exercised three days a week for 150 minutes. According to some research, anxiety and sadness throughout pregnancy constitute two of the main warning signs for depression after childbirth. The fact that postpartum depression was assessed at several intervals after childbirth—1 month (the current study), 6 weeks, 8 weeks, and 12 weeks—could partly account for the differences in the benefits of prenatal exercise shown across. This study was coherence with the current study that exercises have no effect on depression throughout pregnancy but show some results in postpartum period.

The 2018 findings by Robledo-Colonia et al., who showed reduced depressed symptoms by 4 points on the CES-D scale when comparing active and non-exercising non parturient groups, were corresponding to this outcome. An additional investigation on expectant teenagers discovered that a 6-week fitness regimen improved overall self-worth and markedly reduced depressed signs. In contrast to the control group, Goodwin et al discovered that a nulliparous exercise group had a greater mental health rating and reductions in physical complaints, stress, and sleeplessness[21]. The research that currently exists indicates that being sedentary while expecting a child is linked to bad attitude; females who were engaged in exercise throughout the last month of gestation were shown to have lower levels of anxiety.(22) This study compared with the current study that similar results was shown on CESD-scale in 8-week exercise program that reduces the symptoms of depression and insomnia. Another study involved 30 females employed at the Private Emsey Hospital in Istanbul among the ages of 18 and 55 to examine the psychological and physical impact of Pilates workouts on healthy adults. According to reports, the despair and anxiety levels of 30 individuals who underwent therapeutic Pilates training remarkably decreased. The impact of Pilates workouts on females who were expecting their levels of anxiety and tension was investigated in a study. It has been claimed that pregnant women who do Pilates workouts significantly lower their levels of tension and depression. In current study, 19 females who have depression and stress performed Pilates and remarkably decreased in depression after the 8-week Pilates training and showed significant results. Previous study was similar to the current study that throughout gestation period Pilates training reduces the stress.

CONCLUSION

The current study concluded that aerobic and Pilates exercise training both have significant effect in treating depression and improving quality of sleep in primigravida females. But Pilates exercises showed more significant results in treating depression than aerobics in primigravida females.ss and depression.

Limitation of study: Every study always has some limitations. There were some limitations to current study too. Patient education level was not good that they were not willing to participate in the study and hesitated to perform exercises during their prenatal period. Another limitation is the inability to test aerobic capacity before giving them aerobic exercises regimen. This measuring approach may make it demanding to evaluate the data Patients were not recommended for physiotherapy in pregnancy by gynecologist and other health practitioners due to lack of awareness.

Recommendations: Further investigation and work on variety of aerobic exercises e.g. (aquatic aerobic exercises and use of cycling, ergometer) included in antenatal period which will be useful for pregnant ladies. There should be proper follow up by the pregnant ladies. Groupings in a long-term follow-up that may offer further information on the preservation of treatment efficacy over time.

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This article may be cited as: Batool A, Kousar Z, Tariq M, Saleem M, Anwer N, Aslam J: Comparison of Aerobic and Pilates Exercises on Depression and Sleep Quality in Primigravida Females. Pak J Med Health Sci, 2023;18(11): 27-30.