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Benefits of Exercise in Pregnant Women

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Benefits of Exercise in Pregnant Women

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NURS 4500: Nursing Research and Senior Thesis

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Abstract

Exercise is an important lifestyle habit to include in one's daily routine. Remaining physical activity during pregnancy is important. According to the CDC, pregnant women should, “Get at least 150 minutes of moderate-intensity aerobic activity during pregnancy and the postpartum period.” (Centers for Disease Control and Prevention, 2021). This paper will encompass a range of topics that highlight the benefits of exercise from a physiological as well as a mental health standpoint. Although more research needs to be conducted to solidify the benefits of exercise, the articles that were collected demonstrate how it can help mothers have a healthy pregnancy.

Future research should focus on making exercise more accessible to mothers in order for them to follow through with an exercise regimen. A proposal for further research will be explored to help women become more active during pregnancy. This proposal will be looking at how online prenatal exercise programs help pregnant women become more active during pregnancy. An online program can help make exercise more convenient for mothers, especially since many women struggle with other obligations. Through an online program, women will be able to have access to workout routines specifically designed for pregnant women. This study will take place in the Bay Area and have a sample size of 100 participants. The study will be a qualitative and quantitative study with the utilization of questionnaires and interviews. Thematic analysis and descriptive statistics will be used to understand any correlations between the groups.

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Problem Statement

Pregnancy comes with several complications that can be prevented through simple regimens such as exercise. Due to the ever changing phases of pregnancy, women need to develop healthy lifestyle changes in order to maintain their health as well as the health of their baby. One of the top complications of pregnancy are gestational hypertensive disorders such as preeclampsia or gestational diabetes. These complications can lead to severe health issues which can result in a difficult pregnancy or death. Although pharmacological methods may aid in controlling the effects of hypertension and diabetes, there are non-pharmacological methods which can lead to a healthier lifestyle such as exercise.

Exercise has an overall beneficial effect on the body, so what are the benefits of exercise specifically in pregnant women? Although there is limited research on the effects of exercise during pregnancy, a recent study conducted in 2017 stated that “Aerobic exercise for about 20-60 minutes two to seven times per week during pregnancy, is associated with a significantly reduced risk of gestational hypertensive disorder overall, gestational hypertension and cesarean delivery” (Malosso et. al, 2017, p. 2). The effects of exercise can have a beneficial outcome for women since it can reduce major complications of pregnancy such as gestational hypertension and gestational diabetes. It also benefits the baby because gestational hypertension can lead to fetal complications such as growth restriction, oligohydramnios, placental abruption, preterm birth and perinatal death. Research around the benefits of exercise during pregnancy plays a large role in preventing complications for women and their children, and helps communicate the importance of healthy lifestyle choices for a healthy pregnancy. The need for more research on the benefits of exercise is pertinent to women’s health and this paper will include options as to how women can be physically active and the benefits of being active during pregnancy.

Research Question

How can exercise benefit pregnant women?

Literature Review

The studies that were reviewed encompasses a variety of perspectives about the benefits of exercise during pregnancy. These articles were obtained using the Dominican University of California library databases such as Pubmed and CINAHL. The key terms that were used to obtain the article included: aerobic exercise, pregnancy, gestational diabetes, preeclampsia, and anxiety. These terms helped unravel seven articles which revealed various benefits and exercises. These articles were chosen based on the pertinent information and variation of exercises in order to showcase the wide range of exercises that are possible to perform during pregnancy. Since exercise is unique and personalized it was important to find various articles containing different exercise regimens in order to bring light to the various physical activities that can be performed during pregnancy.

The articles can be categorized into several topics. First, although it is recommended to remain active during pregnancy, there is a lack of adherence therefore, the issue of pregnant women' views on physical activity will be explored. Second, the articles will explore the cause and effect of exercise in preventing gestational diabetes and gestational hypertension. Lastly, we will explore the usage of specific exercises such as water aerobics, tai-chi/yoga, dance, and how these activities benefited women during pregnancy. Each article will be summarized on page 19 in the literature review table.

Pregnant Women's Views on Physical Activity

It is important to understand women's views of physical activity during pregnancy because this can inhibit their ability to exercise. The article by Grenier (2021), "Be Healthy in

Pregnancy: exploring factors that impact pregnant women's nutrition and exercise behaviors" is a qualitative study that explores the feelings women feel about exercising and the barriers they face in implementing these recommendations. Although nutrition is also pertinent in maintaining a healthy pregnancy, the information pertaining to physical activity was highlighted and observed. There is a lack of adherence to exercise during pregnancy, and according to Grenier, "Only 15%-38% of pregnant women are reported to follow physical activity guidelines while 60% of women are inactive in pregnancy" (Grenier et. al, 2021, p.1). This study observed the population of women who were not active during pregnancy through interviews and focus groups.

This qualitative study had a sample of 122 pregnant women between 16-24 weeks gestation in southwestern Ontario. Focus groups were utilized and 66 people participated. This qualitative study revealed internal and external factors that inhibit pregnant women to perform physical activity. Themes that were identified during these focus groups were categorized in internal and external factors. Direct quotes from participants were used and allowed researchers to develop a better understanding as to why there is a lack of adherence to physical activity during pregnancy.

Some of the internal factors involved the theme of prioritizing other important tasks such as working, being a mother, and rest. One mother from the focus group stated, "I think part of it for me is multiple roles. So I am still working full-time hours ... And then I have a two-year-old ... And then I am primary income as well ... and I think what happens is you get less and less and less and less time to do the things that you need to do to stay healthy (Focus Group 6)" (Grenier et. al, 2021, p. 5). This emphasizes an important fact that women are not relieved of

their responsibilities when they become pregnant. These responsibilities cause them to limit their own choices that are needed to keep them healthy such as physical activity.

An external factor that contributes to lack of physical activity would be the quality of counseling. Pregnant women have stated that other than a pamphlet containing broad information, they receive no in depth conversation or individualized counseling regarding their existing habits and what behaviors need to be modified. Grenier also emphasizes the lack and quality of resources on physical activity in pregnancy acts as a barrier inhibiting women from being active. It is important to uncover how exercise is being taught to patients in order to improve communication and execution of the recommendations of at least 150 minutes of physical activity per week. Based on these findings, health care providers should create a new approach as to how to have a conversation revolving around the importance of exercise during pregnancy and how it can act as a preventative measure against complications such as gestational diabetes and gestational hypertension.

Relation Between Exercise and Gestational-induced Conditions

Gestational hypertension and preeclampsia are one of the major health complications that cause maternal mortality and morbidity. The article by Margro-Malosso (2017), "Exercise during pregnancy and risk of gestational hypertensive disorders: a systematic review and meta-analysis" focuses on evaluating the effectiveness of exercise during pregnancy on the risk of gestational hypertension disorders. In this study, there were seventeen randomized controlled trial meta-analyses of 5,075 women. Based on their findings, "Women who were randomized in early pregnancy to aerobic exercise for about 30-60 minutes two to seven times per week had significantly lower incidence of gestational hypertensive disorders" (Magro-Malosso et. al, 2017, p. 1). Based on this evaluation, women were able to utilize exercise in order to prevent

gestational hypertension. Preventing this complication can greatly benefit not just the mother but the fetus as well. Hypertension may also cause complications to the fetus such as growth restriction, placenta abruption, or even death. Not only did this article state the decrease in incidence of gestational hypertension, but it also stated a decrease in cesarean delivery by 16%. This was an important article for this research because it provided evidence that exercise during pregnancy does reduce the risk of gestational hypertensive disorders.

Gestational diabetes is associated with excessive weight gain, which can be managed through exercise. Gestational diabetes complicates about 7% of pregnancies in America, and women have a higher risk of being diagnosed with type 2 diabetes after delivery. The next article that will be explored is by Barakat (2019) , “Exercise during pregnancy has a preventive effect on excessive maternal weight gain and gestational diabetes. A randomized controlled trial”. This research explores the effects of an exercise program throughout pregnancy on maternal weight and prevalence of gestational diabetes. This study observed 456 women and was organized between an exercise group and a control group. The exercise group followed an exercise program, which was supervised by an instructor and had a structured regimen: gradual warm up, aerobic exercise, light muscle strengthening, coordination and balance exercise, stretching exercises, pelvic floor strengthening and relaxation and final talk. The results indicated that weight gain was significantly lower in the exercise group compared to the control group. The excessive weight gain was higher in the control group, and the ratio of women diagnosed with gestational diabetes was higher in the control group. Overall, this research reveals how exercise during pregnancy can influence prevention of weight gain and gestational diabetes.

Types of Exercises

Next there are a variety of exercises that can be performed during pregnancy. It is important to note that exercise can be personalized to the individual. This is a wide range of exercises that patients can choose from that can be both beneficial and fun. The first exercise that will be observed is aerobic dance, which is one of the commonly recommended exercises for pregnant women. This article by Daniel (2015), “Acute effect of aerobic dance exercise on blood pressure of normotensive pregnant Nigerian women”, explores the usage of aerobic dance and the effect on blood pressure on pregnant women who have been diagnosed with gestational diabetes. Gestational diabetes increases the risk of developing gestational hypertension, so it is important to implement preventative measures. This randomized control trial had 30 participants divided in an exercise group and a control group. The exercise group participated at least 2 or 3 times a week for 45-60 minutes. The exercise group was led by a physiotherapist who is also a maternal exercise instructor. After 8 weeks into the program, the systolic blood pressure decreased by 4.67 mmHG in the exercise group, while the control group increased by 3.33 mmHG. The diastolic blood pressure decreased by 9 mmHG in the exercise group and increased by 3 mmHG in the control group. The results provide evidence that aerobic exercise such as dance can help aid in lowering blood pressure in women who are diagnosed with gestational diabetes and are at risk of developing gestational hypertension.

Another exercise that can be performed by pregnant women is water exercises. The article by Backhausen (2017) “The effect of an unsupervised water exercise program on low back pain and sick leave among healthy pregnant women - a randomized controlled trial”, assesses the effect of water exercises on lower back pain intensity. Lower back pain is a popular complaint during pregnancy, and can be difficult to treat because of the reoccurrence. Although

lower back pain may seem inevitable, researchers believe that using water exercises strengthening specific muscles and performing stabilization exercises can help relieve pain intensity in the lower back and pelvic girdle. Water exercise helps facilitate greater freedom of movement, making it easier to perform more repetitions of exercises. In this randomized controlled trial, 516 healthy women were randomly assigned to either unsupervised exercise twice a week for a period of 12 weeks or standard prenatal care. A Low Back Pain scale was utilized to measure the pain intensity at 32 weeks. Based on the results, more women in the water exercise group stated low back pain at the follow up 21% vs 14% respectively. Although women have stated that water exercises have helped with their lower back pain, there needs to be more research based on this topic in order to make a significant clinical conclusion.

Exercise such as Tai chi and yoga have been utilized to treat prenatal depression and anxiety. In the article by Field (2013), "Tai chi/yoga reduces prenatal depression, anxiety, and sleep disturbances", traditional treatments have not been used to treat depression or anxiety even though it has many benefits. Tai chi and yoga combined may be an optimal form of exercise for pregnant women in order to target balance and relaxation. In this randomized controlled trial, 92 prenatally depressed pregnant women participated in a tai chi/yoga program for 12 weeks. These sessions were for 20 minutes per week. The results indicated that the exercise group had a lower summary depression score, which was 23.5 compared to the control group which was 26.7. Further research needs to be dedicated to treating prenatal depression because of its higher incidence in ethnic minorities in lower income households.

Literature Review Conclusion

Overall these findings highlight the importance of utilizing exercise in order to prevent or alleviate complications during pregnancy. The strengths of these articles is that they provide a

wide variety of information pertaining to the effects of exercise. Although exercise is recommended, many pregnant women do not adhere to the guidelines either because of the lack of knowledge or inability to because of other obligations. These studies can provide knowledge to those who are at risk of complications or need more information regarding what exercises can be performed during pregnancy. There were limitations to these research articles, and the main issue was the lack of articles regarding different exercises. There is not enough research revolving around water exercise, tai chi/yoga, or dance. Although the articles that were obtained sufficed, it would have been more beneficial to have multiple articles in order to compare outcomes and their results.

Theoretical Framework

Imogene King created a theory called Theory of Goal Attainment. According to Nursing Theory the Goal of Attainment, "...describes a dynamic interpersonal relationship in which a patient grows and develops to attain certain goals. The theory explains that factors which can affect the attainment of goals are roles, stress, space, and time" (Nursing Theory, 2016, pp. 1). The basic concept of this theory revolves around the interpersonal relationship between the nurse and patient, and how the nurse can help support the patient through their growth journey of being healthier. There are different internal and external stressors that nurses need to take into consideration when developing a plan for their patient. Together, the nurse and patient communicate with one another and formulate goals together, taking actions to achieve those set goals, and resulting in the growth and development of the individual. This theoretical framework relies on the nurses ability to communicate essential information pertinent to the patient and support the patient in their individual goals throughout their journey.

Nurses and other healthcare professionals can utilize this framework to help pregnant women attain exercise goals in order to prevent gestational acquired medical conditions and a healthy pregnancy. This framework emphasizes the importance of setting goals that would translate into a healthier lifestyle. Nurses can guide their patients during their pregnancy and develop attainable goals of exercise. The plan will be individualized and unique to the patient in order for it to be easier for the patient to adhere to the regimen. This can result in the patient being more active and maintaining this level of activeness. Pregnant women need the appropriate information regarding what exercises are safe and the consequences of not participating in exercise. Through building a relationship with a nurse, patients can acquire reliable information and together they can create the necessary steps in order to have a healthy pregnancy.

Proposal for Further Study

Introduction

There is an overall lack of knowledge regarding the benefits of exercise for pregnant women, and more research needs to be conducted in order for us to understand why pregnant women should exercise. Although the amount of research has significantly increased between 2010 and 2017, there has been a plateau of studies in recent years. This paper discussed the lack of knowledge women had regarding what exercises are safe to perform during pregnancy and not enough significant data to declare the effectiveness of exercise during pregnancy. The need for further research to determine effectiveness of exercise is detrimental to understanding what modifiable factors can be done to prevent complications during pregnancy. There is a need for quasi-experimental study that examines how exercise can benefit pregnant women physically and mentally. The research studies that were included in the literature review examined various kinds of exercises, however we should also look more into what resources are readily available

within a community. Since there is an overall lack of knowledge regarding what exercises can be performed, this may indicate the absence of resources. Online resources have been expanding in audiences and have helped people become more active through recent years due to the pandemic. Since pregnant women can be more wary about going outside and potentially being exposed to illness, online prenatal exercise programs can be a great alternative. Research on the effectiveness of online prenatal exercise can help widen our knowledge on how beneficial exercise can be in pregnant women.

Research Question

The research question being addressed is - what are the effects of online prenatal exercise groups vs. pregnant women who do not receive prenatal exercise exposure? The purpose of this study is to observe incidences of gestational medical conditions and overall well-being of the mother. The study can help identify the positive and negative effects of home workouts physically and mentally.

Data Analysis

This mixed method study will be a quantitative and qualitative study with interviews and questionnaires. The interviews will allow the participants to discuss their experiences and what they felt worked and what did not work. Through the interviews, a thematic analysis can be conducted to indicate themes shared amongst participants regarding their positive or negative experiences during the study. The questionnaire will be utilized to assess the mental health and stress level of the participants throughout the pregnancy. Descriptive statistics will be used to help organize participants by age, race, ethnicity, employment status, first time mothers, and clinical data such as vital signs.

Ethical Considerations

Before the start of the study, the proposal will be approved by the IRB. All volunteers for this study will be required to sign a consent form containing information about the study prior to the study. This way, all volunteers will know what to expect during the study and will have an opportunity to ask any questions before the study is conducted. All participants' information such as name and data from the study, will be kept protected and confidential.

Recruitment

Recruitment of participants for this study will be catered to pregnant women living in the Bay Area. Social Media will be utilized to help spread awareness of this study. In order to appeal to this population, it is important to emphasize the convenience of working out from home. Although some people have access to gym memberships, sometimes it becomes too difficult to make that trip, especially when they are already exhausted from the day. Home workouts that range from either 10 to 30 minutes can be performed conveniently and can still help the individual remain active.

Methodology

The convenience sample would be 100 pregnant women with 50 women being in the exercise group and 50 being in the non-exercise group. The interventions that will be implemented is an online exercise program that will fulfill the required exercise activity of 150 minutes a week. The group receiving the prenatal exercise online program will perform the exercises at their convenience. Each group will have follow up examinations during the 16th, 20th, 28th, and 36th weeks of pregnancy. The groups will also be given a questionnaire which

will inquire about their thoughts and concerns about the exercise program. The interviews will be conducted only during the beginning and end of the study in order for the participant to reflect and comment on any significant changes they have seen or felt. Vital signs will also be recorded as a baseline and can indicate if the participant is showing signs and symptoms of medical conditions.

Conclusion

Pregnant women need to be protected from complications that can lead to serious health complications for the mother and the baby. Exercise is a cost efficient and easy way to maintain one's health given the right resources and information. A key finding that inspired the proposal study was the lack of information and confidence women had to exercise. Through this proposal study, we can study women of all ranges and see how they respond to accessible exercise information and workout routines. This can truly benefit women because it gives them the information they need to perform exercise in the comfort of their home.

Through the various research, it is clear that more research is needed in order to definitively say that exercise can benefit pregnant women. More research needs to be done to reflect the general population. The literature review observed various exercises however there needs to be resources readily available in the community in order to improve the exercise adherence.

Nurses have the power to prevent and reduce complications during pregnancy through providing education and guidance. It is important as nurses to provide critical information in order to promote a healthier lifestyle, especially during pregnancy. By emphasizing the

importance of exercise, nurses can help prevent complications that can lead to the death of the mother and the baby.

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Mijatovic-Vukas, J., Capling, L., Cheng, S., Stamatakis, E., Louie, J., Cheung, N. W., ... & Flood, V. M. (2018). Associations of diet and physical activity with risk for gestational diabetes mellitus: a systematic review and meta-analysis. *Nutrients*, 10(6), 698.

Wang, T. W., & Apgar, B. S. (1998). Exercise during pregnancy. *American family physician*, 57(8), 1846.

Literature Review Table

1. Be Healthy in Pregnancy: exploring factors that impact pregnant women's nutrition and exercise behaviors

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The goal of this study was to observe women's view on nutrition and physical activity during pregnancy and also discover the barriers of the implementation of physical activity and nutrition recommendations.	Grenier, L. N., Atkinson, S. A., Mottola, M. F., Wahoush, O., Thabane, L., Xie, F., ... & Murray-Davis, B. (2021). Be Healthy in Pregnancy: Exploring factors that impact pregnant women's nutrition and exercise behaviours . <i>Maternal & child nutrition</i> , 17(1), e13068.	122	Health pregnant women between 16-24 weeks gestation -women were recruited from 3 urban centres in southwestern Ontario -66 people participated in focus group	Qualitative study - RCT	There were internal and external factors - Motivation and priority, finances - Misinformation - Quality of counseling - Social support Information by health professionals were limited - inconsistent and overlay broad	-Key findings highlighted the limitations women had on resources related to physical activity	-the findings were limited by the selection bias, since the women who participated were specifically concerned with diet and physical activity. -The focus groups could have been more open to other concerns that pregnant women had

2. Exercise during pregnancy and risk of gestational hypertension disorders: a systematic review and meta-analysis

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The goal of the study was to evaluate the	Magro-Malosso, E.	Meta-analysis pooled	Pregnant	Quantitative meta	The pool of women showed that aerobic	-There were many RCTs	- The main

effect of exercise during pregnancy on the risk of gestational hypertension disorders	R., Saccone, G., Di Tommaso, M., Roman, A., & Berghella, V. (2017). Exercise during pregnancy and risk of gestational hypertensive disorders: a systematic review and meta-analysis. <i>Acta obstetrica et gynecologica Scandinavica</i> , 96(8), 921-931.	17 RCTs including 5,075 pregnant women	women	analysis - RCTs	exercise in singleton pregnancies linked with decreased risk of gestational hypertension disorder Incidence of cesarean delivery was decreased by 16% in the exercise Subgroup analysis for aerobic exercise only with no dietary measures were included, confirmed a significant decrease in gestational hypertension disorders	involved with the topic that provided low bias making the studies accurate to the results. The statistical heterogeneity was also low.	limitation was that dietary counseling was also an intervention that was added to the study, so results also reflected this and was not solely on physical activity.
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3. Exercise during pregnant has a preventative effect on excessive maternal weight gain and gestational diabetes, a randomized controlled trial

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The goal of the study was to examine the effects of an exercise program throughout pregnancy on maternal weight	Barakat, R., Refoyo, I., Coteron, J., & Franco, E. (2019). Exercise	456	pregnant women	Quantitative - RCTs Exercise intervention group and standard care group	Weight gain was significantly lower in EG compared to CG (12.19 vs 13.33 kg) Excessive weight gain was higher in the CG than EG (30.2% vs. 20.5%)	-There was a large number of participants with over >80% of	-Nutrition was not assessed -The study was only focused on a

gain and prevalence of gestational diabetes	during pregnancy has a preventive effect on excessive maternal weight gain and gestational diabetes. A randomized controlled trial. <i>Brazilian journal of physical therapy, 23(2), 148-155.</i>			Exercise group included moderate exercises performed 3 days a week for 8-10 weeks to 38-39 weeks gestation.	Ratio of women diagnosed with GDM was higher in the CG than EG (6.8% vs. 2.6%) Promotion of moderate and supervised physical exercise throughout pregnancy as a method to prevent pregnancy complications and improve quality of life without adverse effects for the mother and fetal well-being	attendance	Spanish population
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4. Effects of an unsupervised water exercise program on low back pain and sick leave among healthy pregnant women - a randomized controlled trial

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The goal of this study was to assess the effects of an unsupervised water exercise program on low back pain intensity. This study aimed to strengthen larger muscle groups through using water buoyancy, which allows greater	Backhausen, M. G., Tabor, A., Albert, H., Rosthøj, S., Damm, P., & Hegaard, H. K. (2017). The effects of an unsupervised water	516	Pregnant women	Pregnant women were assigned either exercise twice a week for a period of 12 weeks or standard prenatal care Back pain was measured by	More women in the water exercise group stated no low back pain at follow up care Increased mobility of the pelvic joints in pregnant women is considered one of the causes of lower back pain, so by strengthening the lower extremities can help as treatment	There was high participation from the participants	-The participants were already very healthy, had high education, low BMI, and were non-smokers. They

freedom of movement, making it easier to do multiple repetitions of exercise even in late pregnancy when you are at your heaviest.	exercise program on low back pain and sick leave among healthy pregnant women—A randomized controlled trial. <i>PloS one</i> , 12(9), e0182114.			the Low Back Pain Rating scale at 32 weeks			were not representative of the general population
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5. Impact of an exercise intervention on physical activity during pregnancy: the behaviors affecting baby and you study

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The goal of this study is to examine the impact of a prenatal exercise intervention on physical activity in women at risk for gestational diabetes mellitus	Hawkins, M., Chasan-Taber, L., Marcus, B., Stanek, E., Braun, B., Ciccolo, J., & Markenson, G. (2014). Impact of an exercise intervention on physical activity during	260	Women at risk for gestational diabetes young ,hispanic and obese	RCT participants : 132 in exercise arm and 128 in the health and wellness arm	Exercise arm had significantly greater increase in sports and exercise compared to the health and wellness arm Greater percentage of women in the exercise arm met recommended guidelines for physical activity	There was an ethnically and socioeconomically diverse population	There were self reports of weight before pregnancy so this may have caused false results. There were only small difference in light intensity activity that were likely not

	pregnancy: the behaviors affecting baby and you study. <i>American journal of public health, 104(10), e74-e81.</i>						clinically meaningful
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6. Tai chi/yoga reduces prenatal depression, anxiety, and sleep disturbances

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
The aim of the study was to observe the effects of alternative therapies such as tai chi and yoga as treatment for prenatal depression and anxiety as well as sleep disturbances.	Field, T., Diego, M., Delgado, J., & Medina, L. (2013). Tai chi/yoga reduces prenatal depression, anxiety and sleep disturbances. <i>Complementary therapies in clinical practice, 19(1), 6-10.</i>	92	Pregnant women Depressed	Quantitative, RCT	Yoga and deep relaxation helped decrease stress by 32% At the end of treatment period, tai chi/yoga group had lower summary depression scores as well as lower negative affect and somatic negative symptoms subscale scores on the CES-D They also scored lower scores on the STAI and had lower sleep disturbances	There is a large sample number and high participation rate.	-More research needs to be conducted in the third trimester when the results of performing TaiChi may be more effective.

7. Effects of aerobic dance exercise on blood pressure of normotensive pregnant women diagnosed with gestational diabetes at federal centre, owerri, south east nigeria

Purpose	Investigator	N	Sample	Design	Major Findings	++	--
<p>The goal of the study was to determine whether moderate intensity exercise will have any effect on the blood pressure of pregnant women with gestational diabetes</p> <p>A study revealed that women with gestational glucose intolerance have increased risk of developing gestational hypertension - so exercise is proposed as a preventive measure against developing hypertension in pregnancy in high risk population</p>	<p>Daniel, J., Venkateswarlu, K., & Ezeugwu, C. (2015). Effect of Aerobic Dance Exercise on Blood Pressure of Normotensive Pregnant Women Diagnosed with Gestational Diabetes at Federal Medical Centre, Owerri, South East Nigeria. <i>Indian Journal of Physiotherapy and Occupational Therapy</i>, 9(4), 124129.</p>	30	Pregnant women with GDM	<p>Quantitative - RCT</p> <p>Exercise group participated in at least 2-3 times a week in aerobic dance classes for 45-60 minutes</p> <p>Exercise programme was led by physiotherapist who was also a maternal exercise instructor</p>	<p>After 8 weeks of aerobic exercise, SBP decreased significantly in the exercise group of 4.67 mmHG, while the other group had an increase of 3.33mmHg. the DBP decreased by 9 mmHG and increased by 3 mmHg in the control group</p>	<p>It was very organized with an actual physiotherapist who was also a maternal instructor.</p>	<p>The sample had a selection bias, so the results reflected the population of Nigeria. The study should further investigate in more diverse populations</p>