



The Effect of Physical Activity during Pregnancy on Childbirth

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Abstract

BACKGROUND: Active pregnant women have fewer physical problems and gain weight during pregnancy, and this often leads to fewer complications as exercise also increases self-confidence and reduces the risk of mood swings after childbirth (postpartum) and depression, and it is not only the women who benefit from being active. The studies have shown that exercise during pregnancy has a “training effect” on the baby and this is reflected in increased heart rate variability and a decrease in the fetus’s resting heart rate.

AIM: This study aims to know the effect of physical activity during pregnancy on childbirth.

SUBJECTS AND METHODS: One hundred and fifty-five patients were collected from Bint Al-Huda Maternity and Children Hospital, Thi-Qar, Iraq, and the samples were divided into two groups (90 women who practiced exercise and 65 for control). All demographic information about patients was obtained through the distribution of questionnaires, and several techniques were used to analyze the results, including the statistical analysis program in evaluating physical activity on childbirth and analyzing the effects generated during pregnancy and the duration of the stage of labor.

RESULTS: Positive results were found in the assessment of physical activity on pregnant women, and the results were in another way related to age and body mass index.

CONCLUSIONS: With an appropriate prenatal exercise program, benefits in the aerobic and muscular state of the pregnant woman, facilitating childbirth, reducing the time of labor, reducing the number of obstetric interventions, reducing signs of settlement of cardiac arrest of the fetus, and promoting recovery from childbirth, as it has favorable psychological well-being and in normal pregnancies.

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Introduction

In various researches conducted across the world, it is recommended for pregnant women to do aerobic training during pregnancy [15]. However, statistics indicate that few women practice this [19]. Data indicate that doing exercise during pregnancy has positive effects resulting in the reduction of cardiovascular risks. Exercise during pregnancy also benefits the fetus improving the child’s health at a later stage. This research, therefore, aimed to determine the effect of physical activity during pregnancy on childbirth. The researcher hopes that the findings of this study will be beneficial for pregnant women as it will inform them of the impacts of exercising during pregnancy.

The benefits and necessity of physical activity during physiologically continued pregnancy have not been the subject of debate among obstetricians and gynecologists and their patients and thanks to regular physical exercises, the movement of the respiratory and cardiovascular systems of the woman improves, the muscles involved in the labor process are strengthened. In addition, the activation of blood circulation and metabolism during exercise has a beneficial effect

on the fetus’s condition [1], [2]. Armstrong BG (1990) conducted a review of several foreign studies on the impact of maternal physical activity on the formation of the uterus and the child’s further development [3].

At present, scientists agree that a sedentary lifestyle increases the risk of complications in pregnant women. At the same time, moderate physical activity can make pregnancy more comfortable, reduce the risk of various diseases in the fetus, and facilitate postpartum recovery for the mother’s body [4].

Exercising during pregnancy can affect the vascular health of the fetus, especially the function of the vascular smooth muscle layer [5]. It should be noted that this scientific work is the first to demonstrate the positive effects of physical activity for a pregnant woman on the health of the fetus in adulthood and that exercise during pregnancy is a powerful programming stimulus for the arteries of the future offspring. Moreover, this programming can significantly impact a child’s predisposition to cardiovascular disease in adulthood. It was shown that as a result of maternal training in offspring in the majority, there was a significant improvement in smooth vascular function [6]. The study authors concluded that the beneficial effects of physical

Table 1: The result of the exercise group

Statistics	Age	Height	W FT	W TH	BMI FT	BMI Third	Pregnancy Period
N							
Valid	90	90	90	90	90	90	90
Missing	12	12	12	12	12	12	12
Mean	32.74	1.65	66.85	77.1	23.96	27.00	279.4
Std. Error of Mean	0.25	0.00	0.76	0.60	0.21	0.27	0.40
Median	33.0	1.70	67.0	77.5	24.0	27.0	280.3
Mode	30.00	1.69	65.00	77.00 ^a	21.00 ^a	23.00 ^a	280.00
Std. Deviation	2.3	0.03	7.2	5.77	1.9	2.5	3.7
Variance	5.720	0.001	52.844	33.311	3.988	6.742	14.432
Skewness	0.365	-0.252	-0.147	-0.148	0.012	0.000	-0.4
Std. Error of Skewness	0.254	0.254	0.254	0.254	0.254	0.254	0.254
Minimum	30.00	1.60	53.00	67.00	21.00	23.00	273.00
Maximum	37.00	1.78	79.00	86.00	27.00	31.00	286.00

^aMultiple modes exist. The smallest value is shown. FT: First trimester, W: Weight, BMI: Body mass index

activity could have many mechanisms, depending on the type, duration, intensity, and frequency of the exercise. In addition, it is essential and necessary to conduct further similar studies of the coronary cycle and study the effect of detected changes in the vascular function of the offspring on its predisposition to the development of diseases cardiovascular at the present stage [7]. A woman should keep fit because childbirth is a severe ordeal. Walking, especially in forest parks, light housework trips outside the city – all this will help promote the woman's health and benefit the child [8].

Properly selected exercises are safe and beneficial for the mother and baby in a normal pregnancy. To choose a set of physical activities, you need to consult a doctor, undergo an examination, and determine the amount and type of stress with a specialist. It is a good idea to include doses of physical activity in your daily routine [9].

Physical activity during pregnancy, especially in the first trimester of pregnancy, is very beneficial for a pregnant woman [10]. The exception is the case when the threat of termination of pregnancy is established. In this case, physical activity should be excluded from the study. If there are no signs of a threat to terminate the pregnancy, such loads as walking, swimming, and walking in the fresh air are considered the most suitable for pregnant women. It is recommended that this be a daily walk in the fresh air in the area from an hour to an hour and a half, preferably a walk before bedtime [11].

Moreover, for many modern women, regular exercise has become a favorite pastime and an integral part of an active lifestyle [12].

Physical activity helps maintain a beautiful body, strengthens the immune system, and protects against diabetes and cardiovascular disease. At

present, in most countries, there is an increase in the number of fitness centers, expansion of the range of services they provide, and sports areas; extreme sports are also becoming more accessible [13].

Therefore, more and more women are interested in whether it is possible to continue to play their favorite sports during pregnancy. What types of physical activity are most suitable for the expectant mother [14].

Scientists have proven that moderate physical activity not only positively affects the course of pregnancy but also reduces the incidence of preeclampsia and also contributes to a faster course of action (according to the Queen's University in Canada – by 30%) and also reduces the risk of developing varicose veins in the limb's inferiority. In 2013, the Mayo Clinic (USA) announced a randomized clinical trial examining the effect of physical activity on weight gain in pregnant women. The study included 962 healthy pregnant women divided into two groups: A control group and women who did aerobic exercise 3 times a week for 50–55 min [15], [16]. Thus, it has been proven that regular exercise during pregnancy can prevent weight gain problems [17].

In pregnant women, exercises that increase intra-abdominal pressure (raising the legs while lying on the back) are prohibited. Furthermore, pregnant women are not recommended to do exercises lying on the stomach and extending the arms above the shoulders [18], [19].

Women who did not exercise before pregnancy are offered only physiotherapy exercises for pregnant women. In contrast, women who regularly attended a fitness club before, with an uncomplicated pregnancy, can continue with regular physical activity. However, the intensity of the exercises and the characteristics

Table 2: Results of control

Statistics	Age	Height	W FT	W TH	BMI FT	BMI Third	Pregnancy Period
N							
Valid	65	65	65	65	65	65	65
Missing	0	0	0	0	0	0	0
Mean	31.74	1.65	67.23	79.6	24.98	28.9	278.33
Std. Error of Mean	0.21	0.034	0.66	0.63	0.23	0.22	0.41
Std. Deviation	2.8	0.06	10.2	9.8	2.56	3.1	7.78
Minimum	28	1.6	54.00	676.00	22.00	24.00	272.00
Maximum	35	1.7	80.00	88.00	28.00	32.00	288.00

^aMultiple modes exist. The smallest: value is shown. FT: First trimester, W: Weight, BMI: Body mass index

of the practices should be adapted to the gestational age and take into account your well-being. During pregnancy, if possible, an individual should give preference to individual sports rather than team sports, and of course, the person should inform the coach about your pregnancy. The second trimester of pregnancy is considered optimal for physical activity [20].

When choosing exercises, pregnant women should remember that the hormone relaxin begins to be produced in their body, and under its influence, the ligaments soften and stretch, which make it possible to diverge the pelvic bones during childbirth and the birth of the child; therefore, due to the effect of relaxin, stretching is not recommended for pregnant women and the latter can lead to infection [23].

It is a topic with a lot of popularity today, which does not mean that it only has been studied in recent years. It was mentioned that sedentary women had more difficult deliveries than active ones. The information in this regard has varied dramatically. At first, several authors informed the pregnant that the best thing in her state was absolute rest. However, after the research and studies, this has been rectified over the years. Nowadays, it has been shown that the best way to have a healthy pregnancy is by performing exercise [21].

It has been pointed out by some obstetrics and gynecology research that it is good exercise during pregnancy if this is normal and making a series of changes, and before starting, it indicates that the pregnant woman should consult with a specialist [22].

Methodology

Patient and methods

Patient sample

One hundred fifty-five samples were collected and these samples were divided into two groups consisting of patients and controls. The samples were collected in communication with Bint Al-Huda Maternity and Children Hospital, Thi-Qar, Iraq.

Study design

All information and demographic data were collected in collaboration with Bint Al-Huda Maternity and Children Hospital, Thi-Qar, Iraq. This study was based on control and patients. Where it was noted that physical exercise should be suspended during pregnancy, a gynecologist has consulted the patient about the advisability of continuing with the program.

The patients included several conditions and specifications, including the absence of any

complications in pregnancy in addition to the presence of good health in addition to lung disease. This was also confirmed by the statistical analysis mentioned and the results of the study give all clarity regarding the possibility of premature birth. "Women do not have to stop exercising when they become pregnant and physical activity during pregnancy does not increase the risk of preterm births."

Study period

The results and demographic information of patients were collected for a study period that lasted for 1 year, from March 16, 2018 to February 19, 2020.

Aim of research

The research aims to know the effect of physical activity during pregnancy and its effect on delivery time.

Statistical analysis

The data were analyzed statistically by relying on the SPSS 25 program and that by conducting descriptive statistics; it is the statistician who is interested in collecting, tabulating, and displaying data and then running the necessary analysis through the use of measures of central tendency, measures of dispersion, and other statistical methods related to descriptive statistics and were found mean \pm SD and p-value for parameters.

Results

As mentioned previously, 155 patients were obtained and they were divided into 90 women who practiced exercise and 65 for control women (Tables 1-8).

Table 3: P-value between the exercise and control group

Parameter	p-value
Age	0.43
BMI	0.081
Weight in third	0.065
W in the first quarter	0.66
Pregnancy period	0.85
Height	0.56

BMI: Body mass index

Discussion

This study was conducted in Ibn Al-Huda Hospital and 155 patients were collected. Samples were divided depending on the type and intensity of exercise of the pregnant woman and through the precise results, which were carried out through the statistical analysis

program, which indicated that physical activity during pregnancy tends to reduce birth weight. Still, it has no effect on the gestational age at birth. This result is supported by the work of Williams 2008 who discovered that physical activity does not affect the gestation period at any point.

Table 4: Indicates the duration of labor (range in a minute)

Statistics	A1S	A2S	A3S
N			
Valid	90	90	90
Missing	0	0	0
Mean	416.6778	138.3000	8.2000
Std. Error of Mean	6.03417	4.37544	0.22133
Median	430.0000	140.0000	7.5000
Mode	480.00	77.00*	6.00
Std. Deviation	57.24515	41.50902	2.09976
Range	195.00	123.00	6.00
Minimum	295.00	77.00	6.00
Maximum	490.00	200.00	12.00
Sum	37501.00	12447.00	738.00

*Multiple modes exist. The smallest value is shown

In addition, pregnant women should have been warned not to avoid sports practices after the passage of 6 months of the gestational age, taking into account the risks that result from exercises during a fall or exposure to any contact, which exposes the fetus to injury on the part of the fetus. Although limited studies examine the safety of high-intensity physical activity on the fetus, the results are often reassuring. Although there was a reduced risk of preterm birth with increased frequency of vigorous recreational physical activity in the first trimester, birth weight was not significantly affected by this level of physical activity.

Table 5: The duration of labor of control (minute)

Statistics	A1SCONTROL	A2SCONTROL	A3SCONTROL
N			
Valid	65	65	65
Missing	0	0	0
Mean	238.8308	121.0615	6.9077
Std. Error of Mean	8.73935	5.51741	0.18177
Median	211.0000	121.0000	6.0000
Mode	180.00*	110.00	6.00
Std. Deviation	70.45889	44.48275	1.46547
Skewness	0.661	-0.312	0.779
Std. Error of Skewness	0.297	0.297	0.297

Table 6: Correlation between patients

Correlations	A1S	A2S	A3S	A1SCONTROL	A2SCONTROL	A3SCONTROL
A1S						
Pearson Correlation	1	-0.216*	0.385**	0.117	0.029	0.021
Significant (two-tailed)		0.041	0.000	0.353	0.820	0.868
N	90	90	90	65	65	65
A2S						
Pearson Correlation	-0.216*	1	-0.030	-0.155	0.681**	0.069
Significant (two-tailed)	0.041		0.782	0.219	0.000	0.585
N	90	90	90	65	65	65
A3S						
Pearson Correlation	0.385**	-0.030	1	0.207	0.005	0.115
Significant (two-tailed)	0.000	0.782		0.099	0.970	0.361
N	90	90	90	65	65	65
A1SCONTROL						
Pearson Correlation	0.117	-0.155	0.207	1	-0.052	-0.005
Significant (two-tailed)	0.353	0.219	0.099		0.683	0.968
N	65	65	65	65	65	65
A2SCONTROL						
Pearson Correlation	0.029	0.681**	0.005	-0.052	1	0.165
Significant (two-tailed)	0.820	0.000	0.970	0.683		0.188
N	65	65	65	65	65	65
A3SCONTROL						
Pearson Correlation	0.021	0.069	0.115	-0.005	0.165	1
Significant (two-tailed)	0.868	0.585	0.361	0.968	0.188	
N	65	65	65	65	65	65

*Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).

Range	249.00	137.00	5.00
Minimum	140.00	44.00	5.00
Maximum	389.00	181.00	10.00
Sum	15524.00	7869.00	449.00

*Multiple modes exist. The smallest value is shown

In this regard, it should be noted that regular physical activity, which provides a relatively high level of fitness before pregnancy, reduces the likelihood of hypothetical risks, and explains the duration of labor where statistical significance was identified $p \leq 0.05$.

Through the statistical analysis using the SPSS SOFT program, in analyzing the relationships for the duration of labor between the two groups of patients and the control group, different differences were identified, as it was observed that there was an inverse relationship between the two groups with respect to the first and second stage = -0.216.

As for the third stage, it was found on a direct relationship, there is no difference in minutes over the duration of labor, as shown in Table 6. In Stages 1 and 2, there was a difference of 2 h and 45 min between EG between the two groups with a statistical significance of 0.005 and this difference was relatively reduced in the second stage. It became 1 h and 40 min and statistically significant until the decrease became relatively unnoticeable in the third stage and became 4 min between stages.

Labor pains at first are usually weak, and there are long pauses between two contractions, and true labor can be recognized by the fact that it becomes more intense and painful over time as it takes longer and comes at shorter intervals. If the contractions last between 20 and 60 s and repeat every 5–7 min over an hour, this is a sure sign that things are about to happen.

Table 7: P-value for the duration of labor between two groups

T	s3	s2	s1
m	0.005	0.003	0.23

Conclusions

Basically, every healthy pregnant woman can exercise because exercising in the right amount provides a lot of energy during pregnancy and can prevent pregnancy problems, such as back and cardiovascular pain. Exercising during pregnancy also reduces psychological stress and can increase the functioning of the body, which can be beneficial, especially during childbirth and the puerperium.

Table 8: Descriptive statistics for the duration of labor (minute)

Descriptive Statistics			
T	Mean	Std. Deviation	N
A1S	413.2031	56.76	64
A2S	137.2969	41.03	64
A3S	8.0781	2.09	64
A1SCONTROL	239.62	70.72	64
A2SCONTROL	121.06	44.83	64
A3SCONTROL	6.9063	1.47	64

With an appropriate prenatal exercise program, benefits in the aerobic and muscular state of the pregnant woman, facilitating childbirth, reducing the time of labor, reducing the number of obstetric interventions, reducing signs of settlement of cardiac arrest of the fetus, and promoting recovery from childbirth, as it has favorable psychological well-being and in normal pregnancies. This study will provide more information concerning the measures that pregnant women should observe while doing exercise.

Recommendation

1. After childbirth, training can be resumed after 4 weeks at the earliest, provided that the postpartum period has passed without complications. However, this should be approached very slowly and only gradually increased so as not to overburden the body.
2. During pregnancy, many changes in a woman's body can affect her readiness to perform. Therefore, you should generally pay attention to warning signs such as shortness of breath, heavy sweating, nausea, headache, poor coordination, and not taking risks. The athletic standard has always been based on personal awareness of the body.
3. Physical changes due to pregnancy mainly occur from the 6th month onwards. They should also be noted when you exercise regularly.
4. The body releases the hormone relaxin during pregnancy, which relaxes tendons and ligaments. Therefore, it is very important that the movements do not stop suddenly, but rather gently and gently.
5. Make sure that your body temperature does not increase too much during exercise, as high body temperature can impair a child's development.
6. Competitive sports or athletic competitions are not recommended during pregnancy.

7. In any case, any sports injuries that lead to further examinations, such as X-rays, which could be harmful to the baby, should be avoided.
8. Fall injuries are particularly serious, as falls can lead to miscarriage in the first trimester of pregnancy and premature birth in the second and third trimesters as well.
9. In the event of bleeding, convulsions, shortness of breath, malaise with dimmed eyes, and headache in connection with the exercise played, an immediate ban on sports and a visit to the doctor are recommended.

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