

Evaluation of physical activity of pregnant women treated with assisted reproductive techniques

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Abstract

The study included 200 pregnant women. The study was conducted in a private gynecological and obstetrics practice Ovea at Szczerbowski Street in Lublin and in the Specialist Medical Centre OVUM in Konopnica in the period between November 2017 and May 2018. The distributed questionnaires were anonymous. Each sheet contained the International Physical Activity Questionnaire and an author's questionnaire.

The aim of this study was to evaluate the physical activity of pregnant women who were treated with assisted reproductive techniques before pregnancy.

Women were divided into groups A ("fertile") and B ("with reduced fertility"). Physical activity in both groups was compared, and then in each group the level of physical activity was individually compared due to selected variables. There were 139 respondents in group A and 61 in group B.

Women in group A, who believed that physical activity may influence the positive course of childbirth and puerperium, had statistically more often a sufficient or high level of physical activity – 62.81% of the respondents, while in women who indicated the answer "do not know" the level of physical activity was sufficient or high only in 33.33% of the respondents ($p=0,017$).

In group B there were no statistically significant results, when the level of physical activity was compared according to the selected variables.

In conclusion, women who had no problems with conception and who are in a stable relationship and do not have ailments in current pregnancy often have a sufficient level of physical activity.

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Introduction

Physical activity is treated, along with proper nutrition and mental hygiene, as one of the fundamental elements of a healthy lifestyle of every human being. Undertaking regular exercise is recommended, also for pregnant women and in the perinatal period [1,2].

There are many types of activity that are safe during pregnancy. Their selection depends primarily on the course of pregnancy, indications and contraindications, the well-being of the pregnant woman and her skills. They should be selected individually [3,4]. During pregnancy, you can begin exercising, however, these more specialized activities usually start after the week 12 of pregnancy, because then the risk of miscarriage and underdevelopment of the fetus is lower [3,4].

Physical activity during pregnancy is not undertaken in order to obtain a slim and sporty figure, but it is intended to prepare a pregnant woman for a huge effort which is a physiological labor [3]. Physical activity during childbirth is the basic method of relieving labor pain, it reduces anxiety and tension levels and accelerates the progress of labor. Physical activity during childbirth is unquestionably recognized as a very important factor that brings relief to the parturient [5].

The benefits of physical activity in the puerperium are faster tensing of uterine muscle, prevention of thromboembolic lesions and better outflow of lochia. Exercising after labor also contribute to the woman's return to her pre-pregnancy weight and improved wellbeing. Thanks to the strengthened pelvic floor muscles, the risk of stress urinary incontinence is reduced [6-8].

The Recommendations of the Polish Gynecological Society concerning antenatal care in physiological pregnancy draw attention to the risk of too intensive physical effort of pregnant women, as well as the types of activities that endanger pregnancy (e.g. skiing, rollerblading, horseback riding, strength training). They should be given up during pregnancy for the benefit of the child.

The aim of this study was to evaluate the physical activity of pregnant women who were treated with assisted reproduction techniques before pregnancy.

Material and methods

The study was conducted in the period between November 2017 and May 2018 in the private gynecological and obstetrics office Ovea at Szczerbowskię Street in Lublin and in the Specialist Medical Centre OVUM in Konopnica.

The research tool was the International Physical Activity Questionnaire (IPAQ – short form)[9], consisting of seven questions and the author's questionnaire, consisting of 27 questions. The level of activity was presented as 'sufficient' (S) and 'insufficient' (IS). The level of 'high' and 'sufficient' physical activity in pregnant women has been combined into one due to the small number of people with 'high' level of physical activity.

From among 200 women, two groups were distinguished: group A – where pregnancy was obtained as a result of a natural conception ("fertile") and group B – women who became pregnant by means of assisted reproductive techniques such as intrauterine insemination and in vitro fertilization ("with reduced fertility"). Group A consisted of 139 persons (69.5%) and group B of 61 persons (30.5%). The study was approved by the Lublin Medical University Bioethics Committee.

Obtained results were subjected to statistical analysis based on Statistica 9.1 computer software (StatSoft, Poland). The Mann-Whitney U test was used to compare age. The Chi² test was used to determine the significance of other correlations. Significance level $p < 0.05$ indicating the existence of statistically significant differences or dependencies was applied.

Results

In group A there were 57 women (41.01%) under 25 years of age, in the range 26-30 years of age – 54 (38.85%), at the age of 31 years and more there were 28 women (20.14%). In group B the highest number of respondents was aged 31 or more – 35 (57.38%), 26-30 – 20 women (32.79%), and 6 women were under the age of 25 (9.84%). Among the questioned women, the highest number of them had higher education – group A: 102 (73.38%), group B: 47 (77.05%), while

secondary education – 35 (25.18%) in group A and 13 (21.31%) in group B, primary/vocational education – 2 (1.44%) in group A and 1(1.64%) in group B. In group A 113 (81.29%) respondents were residents of cities and 26 (18.71%) of villages; in group B there were 42 women (68.85%) from cities and 19 women (31.15%) from villages. In terms of marital status, the majority were women in a relationship – in group A – 114 (82.01%), in group B – 51 (83.61%). Single women (those who in the survey indicated the answer: “miss”/“widow”/“divorcee”) constituted 25 (17.99%) in group A and 10 in group B (16.39%). In both groups, the largest part were respondents, who considered their material condition to be good – in group A – 91 (65.47%), in group B – 40 (65.57%). Respondents who defined their material status as very good were in group A – 25 (17.99%), in group B – 9 (14.95%), and for average/bad – in group A – 23 (16.55%), in group B – 12 (19.67%).

The study showed statistically significant differences in physical activity between group A – “fertile” and group B – “with reduced fertility”. (Chi^2 : 13.15, $p=0.00$). In group A, 82 respondents (58.99%) had “sufficient” activity levels and 57 (41.01%) had “insufficient” activity levels. In group B the level of activity was “sufficient” in 19 women (31.15%) and “insufficient” in 42 (68.85%).

The correlation between age, education, place of residence, marital status, material status and level of physical activity was analyzed. A statistically significant association between marital status and physical activity level in respondents in group A was observed (Chi^2 : 4.55, $p=0.033$). The level of physical activity was “sufficient” in 40.00% of single women, however in women in relationship, physical activity was “sufficient” in more than half of the respondents – 63.16%. There were no statistically significant correlations between the remaining variables mentioned above and the level of physical activity in women in group A and B.

Among the variables presented in Table 2, there is a statistically significant relationship considering respondents belonging to group A, regarding the nature of their hitherto work (Chi^2 : 10.9, $p=0.004$) and the opinion that sport has a positive influence on childbirth and puerperium (Chi^2 : 5.63, $p=0.017$).

In more than half of the respondents performing manual (57.69%) and mental work (52.17%) the level of physical activity was “insufficient”. In the case of mixed type of work, this group was represented only by 26.87%. Among the women who were convinced of a positive effect of sport on childbirth and puerperium as much as 62.81% were engaged in physical activity on a “sufficient” level. In the case of “I don’t know” answers, only 33.33% of the physical activity of the respondents was on a “sufficient” level. There was no statistical significance demonstrated in group B.

An analysis of the relationship between the occurrence of ailments in early and later pregnancy was carried out. A statistically significant correlation was observed between the level of physical activity and abdominal hardening in early pregnancy in group A (Chi^2 : 4.83, $p=0.027$). In $\frac{3}{4}$ of the respondents from this group the level of physical activity was insufficient. In other cases no statistical significance was demonstrated.

Discussion

Nowadays, attention is being focused on the increasing influence of physical activity on the course of pregnancy, childbirth and puerperium. Numerous studies indicate the positive influence of physical activity on this wonderful period of a woman’s life. Exercise during this period should be moderate and should be consulted with the doctor in charge of pregnancy or a midwife.

The American College of Obstetricians and Gynecologists recommends moderate exercise at least 4 times a week for 30 minutes if there are no contraindications and the pregnancy is normal. In the literature we can find the statement that the most optimal time to make a decision about undertaking physical activity during pregnancy is the period of its planning. During pregnancy you should only do sports to which your body is accustomed and you know how it will react to a certain activity. If there are any contraindications to exercise during pregnancy, you should give up the activities.

It is always important to approach women individually, considering all benefits and contraindications.

Table 1.

Level of physical activity depending on age, education, dwelling place, marital status and material status in group A and B

Variables			Level of physical activity				Chi ² p			
			Group A		Group B					
			IS	S	IS	S	Group A	Group B		
Age	Up to 25	N	22	35	4	2	0,23 p= 0,890	0,53 p=0,768		
		%	38,60%	61,40%	66,67%	33,33%				
	26-30	N	23	31	15	5				
		%	42,59%	57,41%	75,00%	25,00%				
	31 or more	N	12	16	23	12				
		%	42,86%	57,14%	65,71%	34,29%				
Total	N	57	82	42	19	-	-			
Education*	Secondary	N	12	23	10	3	0,84 p= 0,358	0,57 p=0,452		
		%	34,29%	65,71%	76,92%	23,08%				
	Higher	N	44	58	31	16				
		%	43,14%	56,86%	65,96%	34,04%				
	Total	N	56	81	41	19			-	-
		%								
Dwelling place	City	N	46	67	28	14	0,02 p= 0,881	0,3 p=0,584		
		%	40,71%	59,29%	66,67%	33,33%				
	Village	N	11	15	14	5				
		%	42,31%	57,69%	73,68%	26,32%				
	Total	N	57	82	42	19			-	-
		%								
Marital status	Single	N	15	10	7	3	4,55 p= 0,033	0,01 p=0,932		
		%	60,00%	40,00%	70,00%	30,00%				
	In a relationship	N	42	72	35	16				
		%	36,84%	63,16%	68,63%	31,37%				
	Total	N	57	82	42	19			-	-
		%								
Material status	Very good	N	12	13	8	1	0,88 p= 0,645	3,7 p=0,157		
		%	48,00%	52,00%	88,89%	11,11%				
	Good	N	37	54	28	12				
		%	40,66%	59,34%	70,00%	30,00%				
	Average/ bad	N	8	15	6	6				
		%	34,78%	65,22%	50,00%	50,00%				
	Total	N	57	82	42	19			-	-
		%								

* Without primary/vocational education due to small numbers

S – sufficient, IS – insufficient

Table 2.

Level of physical activity depending on remaining at work, nature of hitherto work, which pregnancy it is and trimester of pregnancy, incidence of obstetric failures in the past, occurrence of chronic diseases, practicing sports before pregnancy and frequency of sports before pregnancy, absorption of childcare, having children, belief that physical activity has a positive effect on the course of childbirth and puerperium, belief that physical activity has a harmful effect on pregnancy and BMI of respondents in group A and B.

Variables			Level of physical activity				Chi ² p	
			Group A		Group B		Group A	Group B
			IS	S	IS	S		
Remaining at work	Yes	N	16	32	6	1	1,78	1,05
		%	33,33%	66,67%	85,71%	14,29%		
	No/Sick leave	N	41	50	36	18	p=0,181	p=0,306
		%	45,05%	54,95%	66,67%	33,33%		
Total	N	57	82	42	19	-	-	
Nature of hitherto work	Physical	N	15	11	5	3	10,9	0,49
		%	57,69%	42,31%	62,50%	37,50%		
	Mental	N	24	22	20	10	p=0,004	p=0,782
		%	52,17%	47,83%	66,67%	33,33%		
	Mixed	N	18	49	17	6	-	-
%		26,87%	73,13%	73,91%	26,09%			
Total	N	57	82	42	19	-	-	
Which pregnancy	First	N	29	42	17	12	1,3	4,34
		%	40,85%	59,15%	58,62%	41,38%		
	Second	N	23	28	18	3	p=0,522	p=0,114
		%	45,10%	54,90%	85,71%	14,29%		
	Third and more	N	5	12	7	4	-	-
%		29,41%	70,59%	63,64%	36,36%			
Total	N	57	82	42	19	-	-	
Trimester of pregnancy	I	N	10	13	9	2	0,69	1,41
		%	43,48%	56,52%	81,82%	18,18%		
	II	N	28	36	9	6	p=0,71	p=0,494
		%	43,75%	56,25%	60,00%	40,00%		
	III	N	19	33	24	11	-	-
%		36,54%	63,46%	68,57%	31,43%			
Total	N	57	82	42	19	-	-	
Obstetric failures	Yes	N	11	10	19	7	1,32	0,38
		%	52,38%	47,62%	73,08%	26,92%		
	No/ No it is first pregnancy	N	46	72	23	12	p=0,250	p=0,539
		%	38,98%	61,02%	65,71%	34,29%		
Total	N	57	82	42	19	-	-	
Chronic diseases	No	N	34	45	23	13	0,04	1,58
		%	43,04%	56,96%	63,89%	36,11%		
	Yes	N	19	27	16	4	p=0,85	p=0,209
		%	41,30%	58,70%	80,00%	20,00%		
	Total	N	53	72	39	17	-	-

continued on the next page

Table 2.
Continued

Sport before pregnancy	No	N	22	20	21	6	3,0	1,42
		%	52,38%	47,62%	77,78%	22,22%		
	Yes	N	32	56	19	11	p=0,083	p=0,234
%		36,36%	63,64%	63,33%	36,67%			
Total		N	54	76	40	17	-	-
How many times a week?	Once/twice	N	14	17	10	3	1,23	3,8
		%	45,16%	54,84%	76,92%	23,08%		
	Three times	N	12	23	8	3	p=0,54	p=0,15
		%	34,29%	65,71%	72,73%	27,27%		
	Four or more	N	7	15	2	4	-	-
%		31,82%	68,18%	33,33%	66,67%			
Total		N	33	55	20	10	-	-
Childcare	Moderately	N	9	14	5	1	0,09	0,95
		%	39,13%	60,87%	83,33%	16,67%		
	To a high extent	N	12	22	6	4	p=0,768	p=0,33
%		35,29%	64,71%	60,00%	40,00%			
Total		N	21	36	11	5	-	-
Children	Does not have	N	21	36	11	5	0,69	0,0
		%	36,84%	63,16%	68,75%	31,25%		
	Has	N	36	46	31	14	p=0,405	p=0,992
%		43,90%	56,10%	68,89%	31,11%			
Total		N	57	82	42	19	-	-
Harmful effect on pregnancy	Yes	N	2	5	8	1	3,78	3,53
		%	28,57%	71,43%	88,89%	11,11%		
	No	N	46	72	23	15	p=0,15	p=0,171
		%	38,98%	61,02%	60,53%	39,47%		
	I don't know	N	9	5	11	3	-	-
%		64,29%	35,71%	78,57%	21,43%			
Total		N	57	82	42	19	-	-
Positive effect on pregnancy	Yes	N	45	76	28	14	5,63	0,3
		%	37,19%	62,81%	66,67%	33,33%		
	No/ I don't know	N	12	6	14	5	p=0,017	p=0,584
%		66,67%	33,33%	73,68%	26,32%			
Total		N	57	82	42	19	-	-
BMI	Underweight/ Normal	N	48	70	36	13	0,03	2,48
		%	40,68%	59,32%	73,47%	26,53%		
	Overweight/ Obese	N	9	12	6	6	p=0,851	p=0,116
		%	42,86%	57,14%	50,00%	50,00%		
Total		N	57	82	42	19	-	-

S – sufficient, IS – insufficient

Table 3.

Level of physical activity depending on the occurrence of pregnancy ailments in early (up to 12 weeks) and later (after 12 weeks) pregnancy in group A and B

	Variables		Level of physical activity				Chi ² p	
			Group A		Group B		Group A	Group B
			IS	S	IS	S		
Early pregnancy	Bleeding	N	5	7	6	5	0,07	0,6
		%	41,67%	58,33%	54,55%	45,45%	p=0,796	p=0,440
	Abdominal hardening	N	9	3	7	4	4,83	0
		%	75,00%	25,00%	63,64%	36,36%	p=0,027	p=0,958
	Nausea	N	38	51	28	14	0,29	0,3
		%	42,70%	57,30%	66,67%	33,33%	p=0,589	p=0,584
	Vomiting	N	17	26	17	7	0,06	0,07
		%	39,53%	60,47%	70,83%	29,17%	p=0,813	p=0,788
	Absence of ailments	N	13	24	9	4	0,72	0,09
		%	35,14%	64,86%	69,23%	30,77%	p=0,397	p=0,761
Later pregnancy	Bleeding	N	4	3	0	1	0,25	0,17
		%	57,14%	42,86%	0,00%	100,00%	p=0,62	p=0,681
	Abdominal hardening	N	18	20	18	4	0,87	2,7
		%	47,37%	52,63%	81,82%	18,18%	p=0,35	p=0,101
	Nausea	N	10	14	9	3	0,01	0,03
		%	41,67%	58,33%	75,00%	25,00%	p=0,942	p=0,869
	Vomiting	N	6	10	2	2	0	0,08
		%	37,50%	62,50%	50,00%	50,00%	p=0,974	p=0,777
	Absence of ailments	N	33	53	18	12	0,65	2,16
		%	38,37%	61,63%	60,00%	40,00%	p=0,421	p=0,142

S – sufficient, IS – insufficient

Due to small number, Chi² Yates was used in group A for early pregnancy bleeding and abdominal hardening and later pregnancy bleeding and vomiting, in group B for bleeding, abdominal hardening and absence of ailments in early pregnancy and bleeding, nausea and vomiting in later pregnancy.

The benefits of such activity include easier tolerance of pregnancy, better uteroplacental blood flow, which results in a very good impact on the development of the fetus. Moreover, it prevents obesity, diabetes and cardiovascular diseases.

Gałązka et al. [10] and Ivanovich-Palus [1] show in their studies that pregnant women reduce their physical effort already in the first trimester due to

pregnancy ailments at the beginning of pregnancy. Studies have demonstrated that physical activity during pregnancy is reduced by most women regardless of their fertility problems. Therefore, 60.43% of women with no fertility problems and 67.21% of women with fertility problems reduce their activity. This may be due to these women's concerns about their children.

In their research, Wójtowicz [11] and Ćwiek [12] demonstrated that a walk is the most frequently chosen form of activity by pregnant women. The authors report on its positive effect on the pregnant woman's body. In our research, walking was also the most frequently chosen form of activity, regardless of a woman's fertility status. This form of activity was preferred by 82.01% of women with no fertility problems and 81.97% of women with reduced fertility.

Gałązka [10] noticed a tendency towards decrease of interest in education concerning the safety of physical exercise in women whose pregnancy is threatened yet again. She noted that the number of obstetric failures affects the willingness to further education in this subject. A similar trend was also observed in the study, as women with reduced fertility more often did not obtain information on physical exercise in pregnancy (19.67%) than those with no fertility problems, of whom only 5.04% did not acquire information on this subject.

Wojtyła [13] proves in his research that about 60% of pregnant women do not exercise because of concerns about the health of their child. It was shown that the level of physical activity in group A "fertile" was insufficient in 41.01% of respondents, while in group B "with reduced fertility" this level was insufficient in 68.85%. This may be due to the greater forethoughtfulness of women in group B, due to the long period of time spent trying to have a child and the fear of the occurrence of complications during pregnancy, than in women in group A, who were pregnant after a year's effort.

In their research Banyś et al. [6] proved that pregnant women are highly aware of the positive influence of physical activity. As much as 90% of women answered that daily physical activity is beneficial for the woman's body, but also for the unborn child. Such facts fill us with full optimism. Evidence from research has also proven that pregnant women are highly aware of the positive influence of physical exercise on the course of childbirth and puerperium. In fact, 87.05% of women with no fertility problems were in favour of the beneficial effects of exercise, while 8.63% did not have their own opinion on this subject. In the group of women with reduced fertility, this approach was supported by a little less, because

68.85% of the respondents, however, as much as 29.51% did not have their own opinion. Such a result may be a consequence of the previously presented opinion that women with obstetric failures are more cautious, but also more often do not reach for the knowledge concerning this issue.

Conclusions

The physical activity among pregnant women is generally not sufficient. Reduced fertility and obstetric failures are often factors that limit the physical activity. The occurrence of ailments during pregnancy also reduces exercising among pregnant women. Unfortunately, fertile single woman are often less physically active than those in a relationship. It is encouraging that women are aware of the benefits of exercise during pregnancy.

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