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Physical activity and childbirth classes during a pregnancy and the level of perceived stress and depressive symptoms in women after childbirth

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Summary

Aim. The aim of this study was to answer the question of whether physical activity during pregnancy and participation in childbirth classes prepare women for childbirth; further, does it influence the levels of perceived stress and the occurrence of depressed mood.

Methods. 100 women participated in the study. Half of the women had taken part in the childbirth classes before giving birth. A questionnaires of own authorship, Edinburgh Postnatal Depression Scale (EPDS) and Perceived Stress Scale (PSS-10) were used.

Results. There was no significant relationship observed between participation in childbirth classes and the results of EPDS and PSS-10. The mood of women after childbirth correlated significantly with the level of stress in the whole study group ($p<0.0001$). Best mean wellbeing and lowest mean perceived stress were observed in women who stayed in a relationship ($p = 0.0029$, $p = 0.0008$). Women physically active during pregnancy were also characterized by better mood and lower levels of perceived stress (6.7 and 14.4 vs. 8.4 and 16.0). Among women exercising during pregnancy the participants in childbirth classes was far more numerous ($p<0.0001$).

Conclusions. Declared physical activity during pregnancy was linked to lower levels of stress experienced by women and less severe depressive symptoms after childbirth, especially in the group of childbirth classes participants.

Key words: depressive symptoms, childbirth classes, perceived stress

Introduction

The period of pregnancy, childbirth and puerperium is the period of dynamic hormonal changes as well as changes which take place in the woman's psyche. Many authors underline that these are not only the biological factors, but also the psycho--social ones, as well as sociodemographic and socioeconomical conditionings and marriage/partnership conflicts and stress that predispose to the occurrence of emotional disorders in women after childbirth [1-6].

Apart from postpartum psychosis and acute postpartum stress reaction the most frequent ones cover postpartum blues depression and postpartum depression [3, 5].

Postpartum blues depression occurs in 30 to 75% of mothers [7, 8] and takes place during the first days after childbirth, with the greatest intensity between the 3rd and the 5th day [9]. Postpartum depression however, takes place in the later period (within a month from childbirth) in 10-20% women after a childbirth [8, 10]. As it was stated by the authors, postpartum blues is one of the factors of postpartum depression risk confirmed in many experiments and the fact of obtaining the result $\geq$10 points on the fifth day after a childbirth in the Edinburg Postnatal Depression Scale (EPDS) increases the risk of postpartum depression occurrence 6 weeks after a childbirth thirty times [5, 11, 12].

At a time when women spend less and less time after a childbirth in the labour ward, it is essential to select as fast as possible (during the pregnancy, peripartum and postpartum period) women from the group of risk of suffering from postpartum depression. This is why it is important to apply screening tests and to carefully observe women with reference to mood disorders from the first days after childbirth.

The broadly defined prophylactics and psychoeducation even during the pregnancy is of special importance. In the prophylactic actions the prepartum care which is offered by childbirth classes is especially important [3]. Childbirth classes prepare future parents professionally using theoretical and physical exercises for safe pregnancy, safe and active labour and postpartum period. They teach how to care for newborn and baby, prepare for breastfeeding, they teach dialogue with a child in the intrauterine stage of child development. According to many authors appropriately selected physical exercises (proposed also in childbirth classes) and physical activity during pregnancy help prepare the woman and her body for childbirth [13-15]. This prevents lowering of mood in women during pregnancy and the postpartum period and it promotes a faster recovery [15, 16].

The mechanism of the influence of physical activities on depression is especially essential as it is based on psychological ('faith in yourself' and the conception of distracters) and biological (for example β-endorphin and thermogenic theory) theories [17, 18]. In connection with the above, the purpose of the experiment was to assess the effectiveness of childbirth classes in the prevention of postpartum emotional disorders.

Materials and methods

The experiments were carried out from February to April 2013, in the Gynaecology and Obstetrics Clinic of Clinical University Hospital in Wrocław. The patients

who declared no family history and occurrence of psychic disorders and expressed informed consent for the participation in anonymous research were qualified. These were surveys which did not involve any interventions or experiment structures; they were carried out subject to the patients and the head of the ward's approval, under the ethical and legal supervision of Department of Physiotherapy of the University School of Physical Education in Wrocław.

The study was conducted 100 women. Half of the women had taken part in the childbirth classes before giving birth. Both study groups did not differ with respect to age (age 18 to 40 years, mean age 29.8 years), marital status, place of residence (rural, urban) and education. Accurate date presented table 1.

Table. 1. **Characteristic of study groups.**

Variable	Participation in childbirth classes		Total	Statystical analysis
	Yes	No		
	Mean	Mean	Mean	t = 0,73
Age	30,1	29,5	29,8	p=0,466
Education	**n**	**n**	**n**	
elementary/vocational	2	6	8	χ^2 = 2,18
secondary	12	14	26	p = 0,201
high	36	30	66	
Marital status	**n**	**n**	**n**	
married	42	38	80	χ^2 = 1,15
unmarried woman in a relationship	6	8	14	p = 0,562
single	2	4	6	
Place of residence	**n**	**n**	**n**	
village	5	7	12	χ^2 = 2,78
city with less than 100 thousand inhabitants	2	6	8	p = 0,249
city with other 100 thousand inhabitants	43	37	80	
Type of employment	**n**	**n**	**n**	
labour contract/mandate contract	45	30	75	χ^2 = 13,26
own business activity	5	14	19	p = 0,001
unemployed	0	6	6	

In order to carry out research the following were used: Edinburgh Postnatal Depression Scale (EPDS), Perceived Stress Scale (PSS-10), a survey of own authorship containing personal data (such as age, education, place of residence, marital status) and questions about pregnancy and childbirth, previous births, as well as questions on participation in childbirth classes and physical activity during pregnancy.

The EPDS scale was developed by Cox et al. as a self-assessment questionnaire used for detection of depressive symptoms in women after childbirth. Patients self-completed the questionnaire consisting of 10 questions, selecting one of four responses from 0 to 3 in accordance with the increasing severity of symptoms that they think best describe their mood in the last 7 days. The maximum score is 30 points. Obtaining a score of 10 points or more may indicate the presence of emotional problems in the respondent. An affirmative answer to the last question about thoughts of self-harm, despite failure to obtain a score above 10 points requires consideration of psychiatric intervention [19].

The PSS-10 scale is used to assess the intensity of stress connected with personal life circumstances in the last month. The intensity of stress is not determined by the number of stressful situations, but its assessment by the patient. The scale contains 10 questions concerning subjective feelings related to problems, personal events, behaviors and ways of coping with stressful situations. A respondent can get a result of 0 to 40 points where 0-13 points indicates a low level of perceived stress; 14-19 points indicates an average level of perceived stress, and 20-40 points indicates high levels of stress [20].

The assessment of well-being of women and the perceived stress levels were most often performed on the third day after birth [3].

In the statistical analysis in assessing the interdependence of characteristics of variables with a continuous distribution a Spearman's ρ rank-order correlation coefficient was used, in the case of variables with a discrete distribution a chi-square test of independence was used. Comparisons between groups were performed using Student's t test for independent groups. In the case where $p < 0,05$ statistical significance will be deemed to have been proven. Calculations were performed using the statistical package STATISTICA 10 by StatSoft.

Results

The symptoms of postpartum depression (EPDS≥10) appeared in 34% of women, while 22% of respondents characterized with high level of perceived stress (PSS-10≥20).

Both groups of women those participating in childbirth classes and those non-participating women, were characterized by similar well-being after birth and mean feelings of stress. Therefore, there was no significant relationship observed between participation in childbirth classes and the severity of depressive symptoms after childbirth and the level of perceived stress (Table 2).

Table 2. **Level of depressive symptoms and perceived stress levels after birth and participation in childbirth classes.**

Scale	Participation in childbirth classes				Student' test	
	YES		NO			
	Mean	SD	Mean	SD	t	p
EPDS	7.1	5.0	8.1	5.7	0.91	0.363
PSS-10	14.4	6.0	16.1	7.8	1.20	0.231

The mood of women after childbirth (severity of depressive symptoms after childbirth) correlated significantly with the level of stress in the whole study group ($t = 8.46$; $p<0.0001$).

Of all concerns, those associated with complications during childbirth, pain and poor health of the newborn have dominated. Participation in childbirth classes reduced fears related to childbirth complications as well as motherhood being a new situation (Table 3).

Table 3. **Fears that were most felt before giving birth.**

The biggest fears associated with giving birth	Participation in childbirth classes		Total	Chi-square test	
	YES	NO		$\div^2$	p
Pain	31	30	61	0.04	0.838
complications during childbirth	27	37	64	4.34	**0.037**
motherhood as a new situation	2	8	10	4.00	**0.046**
childbirth as a new situation	2	3	5	0.21	0.646
hospital and hospital personnel	10	7	17	0.64	0.424
poor health of the baby	27	23	50	0.64	0.424
no concerns before childbirth	5	2	7	1.38	0.240

Women participating in childbirth classes significantly more often than women not participating in such activities were broadening their knowledge about parturition and knowledge about the future care of baby from books or the Internet ($p = 0.014$, $p = 0.044$ respectively). Most of the women attending childbirth classes were of the opinion that these classes have prepared them to go through labour; such opinion was shared by 41 women, or 82% of the group.

Best mean well-being and lowest mean perceived stress were observed in women who stayed in a relationship. Upon division of surveyed women into two groups: those in a relationship (formal or informal) and those who were single, the difference of mean level of well-being and the difference in perceived stress were statistically significant ($p = 0.0029$, $p = 0.0008$). Less meaningful was the length of marriage or the time spent in non-marital relationship, as well as participation in childbirth classes. Statistically significant correlation was also not established between reduced mood, perceived stress and the age and education of women surveyed.

Slightly less than half of the female participants in childbirth classes were accompanied by a loved one during childbirth. At the same time 92% of participants in childbirth classes ($n = 46$) were accompanied by a loved one during these classes. Women who did not attend childbirth classes were seldom assisted by loved one during labour (14%, $n = 7$) (Figure 1).

Almost all women were accompanied with the child's father during the childbirth, only in 1 case it was a friend. It was similar as far as the participation in childbirth classes is concerned; the accompanying person in all cases was also the child's father.

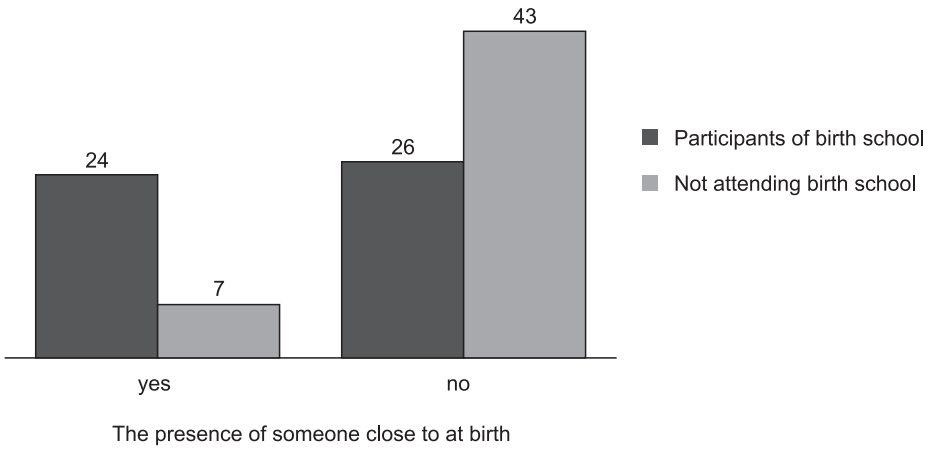

Figure 1. **Participation in childbirth classes and the presence of loved one during labour.**

The average level of postnatal depression was higher in the case, which is somewhat surprising, when during labour women were accompanied by loved ones. However, this relationship is not statistically significant. The presence of a loved one during labour depended significantly on whether the woman giving birth had participated in childbirth classes beforehand.

More than half of the surveyed women were giving birth for the first time. In remaining women, with the exception of 4 women, it was a second childbirth. The order of birth however had no significant effect on mood and stress levels.

Most deliveries ended up being performed by caesarean section (62 deliveries), and only 38 were performed by forces of nature. Participation in childbirth classes had no effect on the manner of delivery ($p = 0.680$).

Duration of pregnancy, followed by delivery ranged from 35 to 42 weeks, with an average of 39 weeks. A significantly lowered well-being after childbirth was found in women who had premature babies compared to women delivering at term ($p = 0.049$). The same tendencies were observed for the perceived stress ($p = 0.043$).

Women physically active during pregnancy were characterized by better mood and lower levels of perceived stress (6.7 and 14.4 vs. 8.4 and 16.0). Among women exercising during pregnancy the participants in childbirth classes were far more numerous (Table 4).

Table 4. **Exercising during pregnancy and participation in childbirth classes.**

Exercising during pregnancy	Participation in childbirth classes		Total	Chi-square test	
	YES	NO		÷2	p
YES	37	9	46	31.56	**< 0.0001**
NO	13	41	54		

Exercising during pregnancy was most often performed twice a week. Women who exercised during pregnancy more than that had on average better well-being and lower perceived stress (Figure 2). Correlating the frequency of exercise before childbirth with well-being after birth is stronger than with the level of perceived stress ($p = 0.051$; $p = 0.063$ respectively).

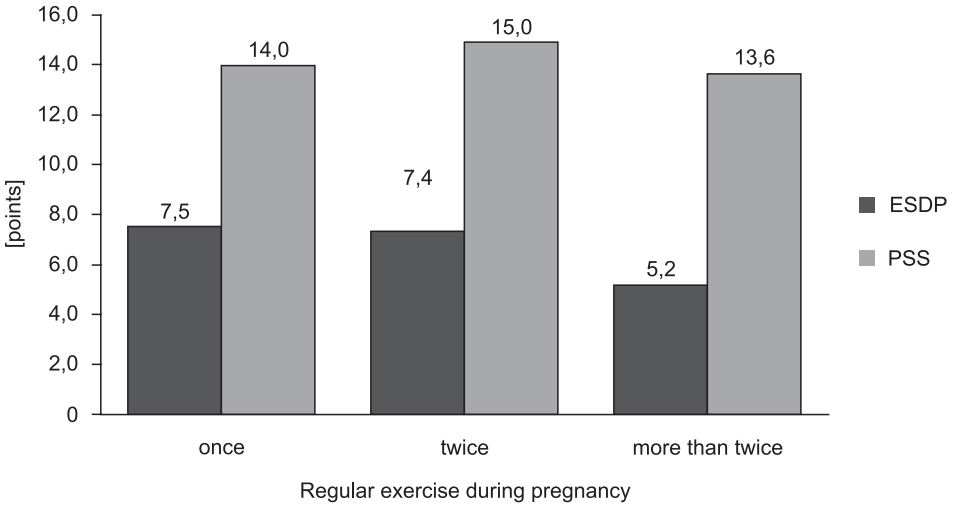

Figure 2. **Mean values of the assessment of postnatal depression and perceived stress and the frequency of exercising during pregnancy.**

For question 10 of the EPDS questionnaire which deals with suicidal tendencies, research data provided the following responses: Never – 92 people, Practically never – 6 people, Sometimes – 2 people.

Discussion

Pregnancy and puerperium as well as changes which take place in the woman's organism as well as numerous risk factors mentioned by researchers contribute to the occurrence of emotional disorders in the postpartum period. The results presented here confirm their frequent occurrence. The symptoms of low mood were present in 34% of examined women. The result is analogical to the reports from other authors [5, 7, 11, 21].

In case of comparing the participants of childbirth classes and women who did not participate in the type of activities, one can notice lower depression and stress level as far as the first group is concerned. These results are not statistically significant. Nonetheless, they are similar to the results Bączyk et al. who observed that a higher level of knowledge and skills among future mothers who had completed the course preparing them for childbirth and motherhood decreased the stress levels, as a result of which lower levels of depressive symptoms after birth were reported [22].

The period of pregnancy, childbirth and puerperium is an extremely stressful event in the woman's life. In the examined group only 39 respondents was characterized with low stress level. And stress, in the authors' opinions is the essential predicator of postpartum depression disorders [6]. It is also confirmed by the analysis of correlation carried out, which showed strong relationships between the level of stress perceived and the mood of examined women. The higher the level of stress perceived was the worse well-being of the women after the childbirth.

It was noted that the fears of parturients that had occurred in these studies, predominantly about complications at birth, pain and poor health of the child concerned mainly women do not attend to childbirth Classe. This corresponds well with the results of Valentin et al., who observed a significant reduction in the fear of childbirth complications among participants of childbirth classes as well as greater peace of mind before delivery [23].

It is worth noting that it is this group of women in this study that had more frequently broadened their knowledge about pregnancy and childbirth from available books and the internet. According to studies Stangret et al., women after the preparatory course better assess their knowledge about labour and their physical condition, they are more aware of the desirability of physical activity during pregnancy and they know it is positive effects on the body, they stick more to a hygienic lifestyle and they are characterized by a higher self-esteem [24]. Also Soet et al. argue that theoretical preparation for childbirth reinforces the faith of women in their own abilities and skills, which effectively reduces stress and the fears associated with it [25]. It can be stated then that emotional condition of women in the postpartum period is indirectly dependant from the knowledge they had about the stress situations which are the childbirth and the puerperium.

Many authors report that marital status is the predicator of postpartum depression [1, 26]. The experiment results obtained confirm that marital status influences on well--being and stress perceived even during the early postpartum period. Best average well--being and the lowest average perceived stress was shown by women in a relationship, while the worst well-being and the biggest stress occurred in single women. Gałuszka et al. also point out that improvement in mental state and achievement of balance after birth depends largely on whether the woman was single or in a relationship. The best results were achieved in the group of mothers with two children who were in a relationship; the least improvement was seen in the group of single women [27]. It is then an import risk factor of depression disorders, which shall be taken into account while caring for a women in puerperium, especially now, when a great number of women decides to have a child being single.

According to numerous scientific research, the presence of a close person in childbirth classes and during the childbirth is a great psychic and physical support for the woman in labour and essentially decreases the frequency of complications after it [3]. In own experiments presented in most cases it was the child's father who accompanied the examined women both in childbirth classes and the childbirth. The participants of childbirth classes decided for the family labour more often and the decision, as it was declared by the women, was made jointly with the child's father. Despite this,

analysis of the results has revealed that further mothers after a family childbirth were characterized by a more reduced well-being compared to the well-being of women giving birth traditionally. The values, however, were not statistically essential but they are different from the reports of other authors. Even though most fathers had participated with their partners in childbirth classes one should consider whether their level of knowledge and attitude were indeed a support for the woman in labour, while the decision made about family labour was joint, indeed. Additionally, it ought to be thought over whether childbirth classes equally prepare for childbirth the woman and the person who will accompany her during delivery. As it results from available experiments, the child's father or another close person present during the childbirth shall be familiarized with the course of labour and prepared for the tasks which she/he is about to carry out for the woman in labour. In the opinion of Sioma-Markowska et al., the attitudes which partners have during the labour may be extremely different starting from the active to passive [28].

It is not known then what attitudes during the labour were presented by the fathers in the experiments mentioned, however it might have influenced on the results obtained. It is especially so, that among all family labours (n=31), 7 pairs did not participate in childbirth classes. Bearing in mind the research saying that these are childbirth classes that are one of professional forms of preparation to mutual labour and parenthood, one can expect that people were the least prepared for the childbirth and puerperium [3, 28, 29]. The declared mutual decision made with the child's father about the family labour seems also to be important. It has to be remembered, however, that the information does not need to be objective as it comes only from the women in labour who filled in the survey. Many experiments prove that the decision about the family labour is often made on the initiative of one of the partners [28]. It seems then that the choice of family labour should be considered and thoroughly discussed before, e.g. at the stage of childbirth classes as the presence of a close person (the child's father) in childbirth classes does not involve the consent for the participation in the family labour.

Studies have shown a significantly reduced well-being in the event of a delivery by caesarean section. This is confirmed by the results of Fórmaniak et al. who observed that in patients after caesarean section severe symptoms of depression were more frequent [30]. The presented high ratio of caesarean sections (n=62) results mostly from the specificity of the hospital in which the examination was carried out. It is the hospital of 3rd reference level where patients from the whole region qualified for the type of solution are directed to due to contraindications, comorbidities or child condition.

Higher levels of stress and reduced well-being were also reported in mothers of premature infants. Premature childbirth is a difficult situation and disruption of the physiological process of woman's preparation for the role of a mother. It is also caused due to fear for the health condition of the newly born child [31].

The reports of many authors indicate that physical activity during the pregnancy influences on the childbirth and puerperium [32, 33]. The results obtained also confirm that the systematic physical activity during pregnancy has a beneficial impact on the mood during the postpartum period and also decreases the level of stress perceived.

The results are also consistent with the results carried out by Gałuszka et al., which showed that physical exercise made by pregnant women during the pregnancy, are a successful factor which prevents from depression conditions [27].

Similar to the experiments of Ćwiek et al., physical activity was statistically more common with the participants of childbirth classes the inseparable element of which are physical exercises [15]. In smaller researches the frequency of exercises made was also important. The more frequently women exercise during pregnancy the better the mood and lower stress level in the puerperium period. It is another fact which speaks for systematic and rationed physical effort is the efficient factor which prevents from origination of emotional disorders during the postpartum period. It is then worth to encourage and promote physical activities among the pregnant women in the form of e.g. gymnastics, swimming and yoga [15], and also persuade them to continue it during the puerperium period.

The conducted research also revealed that eight women participating in the study required a psychiatric consultation because of suicidal thoughts. An increasingly shorter stay of women in the maternity ward limits the possibility of a careful observation of mother for signs of depression as well as for skills on how to cope with stress and child care [3]. Many authors recommend that screening tests (eg. EPDS) should be performed on women as early as during pregnancy for direction of depression. It has to be underlined, however that a few days after the labour, the examination with the use of EPDS may only determine the postpartum blues. Postpartum depression can be diagnosed after a few to several weeks based on clinical examination. However the assessment of psychical condition in such an early puerperium period, as it is underlined by Mojs et al. may be of application valour for the midwives and obstetricians, who meet with patients during the subsequent check-up visits [34].

Further, the obtained results prompt reflection on the subject of presence of support groups and psycho-therapeutic help in the gynecological-obstetric wards and in childbirth classes, especially for women in high-risk groups, threatened with emotional disorders during the postpartum period (single women, inactive during the pregnancy, delivery by caesarean section, premature labour, high level of perceived stress).

Conclusions

1. A declared physical activity during pregnancy was linked to lower levels of stress experienced by women and less severe depressive symptoms after childbirth, especially in the group of childbirth Class participants.
2. In the study group, there was no significant relationship between attendance at childbirth classes and the level of perceived stress and mood in women after childbirth.
3. A strong relationship has been found between the level of perceived stress and depressive symptoms in the whole studied group of women after childbirth.
4. Physical activity is one of the preventive factors with regard to postpartum emotional disorders.

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