Assessment of the emotional state of women in the early postpartum period during the COVID-19 pandemic

MARTA SADOWSKA-WARTA[1,2], MALWINA PAWIK[1] , JOANNA KOWALSKA[1]

[1] Department of Physiotherapy, Wroclaw University of Health and Sport Sciences, Wroclaw, Poland
[2] Medicorum Centrum Zdrowia, Pogórze, Gdynia, Poland

ABSTRACT

Purpose. The study aimed to assess the emotional state of women in the early postpartum period during the COVID-19 pandemic.

Methods. The study was carried out using the Perceived Stress Scale (PSS-10) and the Edinburgh Postnatal Depression Scales (EPDS). Sociodemographic data (e.g., age, marital status, education) and information concerning the women's pregnancy and childbirth were collected using the authors' own survey. That survey also included questions about childbirth-related fears, sources of knowledge about childbirth and infant care, physical activity and participation in childbirth classes. The study consisted of 224 postpartum women, of whom 124 were examined during the COVID-19 pandemic (between March and June 2021). The data obtained were compared with the results of the examinations carried out prior to the pandemic (100 women were examined between February 2019 and May 2019).

Results. In both of the analysed groups, the mean stress was at an average level. However, in the COVID-19 group, a significantly higher level of perceived stress was noted. In this group, most women were experiencing high levels of stress.

Conclusions. Regardless of the research results, providing women with comprehensive perinatal care is essential, irrespective of the existing epidemiological situation in a given country.

Key words: postpartum depression, puerperium, stress, baby blues, medical conditions, pregnancy

Introduction

The postpartum period for a woman and her newborn is crucial for both short-term and long-term health and well-being [1].

Early puerperium is the period of the first week after childbirth when anatomical, morphological, and functional changes occur in the woman's body. Numerous changes and challenges related to the role of the mother and her socioeconomic situation may affect her emotional state and mental health [2]. Postpartum blues, or baby blues, are prevalent in the first week after birth [3]. Emerging mood disorders result from a decrease in the level of estradiol, progesterone and prolactin due to the expulsion of the placenta. This period is characterised mainly by anxiety, tearfulness, lability, and sleep disturbances. The peak in the severity of the symptoms occurs 2–4 days after delivery, subsides within 2 weeks after delivery, and does not significantly interfere with the woman's functioning. More serious forms of mood disorders are postpartum depression and psychosis, which most often occur within a month after childbirth [2, 4–7].

Previous reports indicate that postpartum depression (PPD) affects 30% to 75% of women [8, 9], while other research indicates that postpartum depression affects about 1 in 10 postpartum women [6]. Research by Golec et al. [10] on the assessment of mood disorders in patients in the early postpartum period showed that 11.96% of them had symptoms of mild depression, and 0.54% had symptoms of moderate depression. Niegowska and Kobos report that every third woman in the first week postpartum shows a high risk of postpartum depression [11].

The main factors affecting the mood of a woman in the early postpartum period are hormonal changes,

the presence of mood swings or depression in the past, as well as the presence of postpartum depression in the family history. Other important factors are lower socio-economic status, teenage pregnancy, lack of education, unplanned or unwanted pregnancy, health complications of the woman during pregnancy and the need for hospitalisation, difficult childbirth and health problems of the newborn [7, 10, 12].

Another factor affecting the stress level was determined to be the COVID-19 pandemic announced in March 2020 by the WHO. During the COVID-19 pandemic, women experienced increased anxiety in the perinatal period. The pandemic and the restrictions introduced caused several concerns. Women were afraid of childbirth without an accompanying person, separation of the mother and child, or infection with the SARS-CoV-2 virus. Studies of the emotional state of patients staying in the hospital after childbirth showed that 30% of the respondents indicated a risk of postpartum depression. The respondents were most afraid of health complications in their children. Restrictions on family visits during hospitalisation were also an essential factor in increasing stress levels [13–15].

The current organisational standard of perinatal care recognises the assessment of the mental state of woman during the pregnancy and the puerperium, including the risk of postpartum depression, as a basic element of medical care. Evaluation at an early stage enables preventive actions to be incorporated. The prevention of postpartum depression includes mainly psychological support and education, aiming to build women's awareness of motherhood [16]. Research shows that earlier preparation for childbirth and parenthood by participating in childbirth classes significantly increases self-efficacy and perceived available support, directly reducing perceived stress and anxiety [17]. In Poland, a program for preventing postpartum depression was launched for women, enabling them to take advantage of free consultations and conferences and to join groups for mothers with children [18].

Many research results indicate the significant preventive importance of physical activity undertaken during pregnancy. Exercise reduces the level of perceived stress, reduces the severity of depressive symptoms, and also promotes a faster return to shape after childbirth [12, 16, 19].

The study aimed to assess the emotional state of women in the early postpartum period during the COVID-19 pandemic and to answer the following research questions:

What was the stress and mood level in the women in the early postpartum period during the COVID-19 pandemic compared to the women giving birth before the pandemic? What was the level of stress and mood in the physically active and inactive women surveyed during pregnancy?

It was hypothesised that the group of women in early puerperium during the COVID-19 pandemic would be characterised by worse moods and higher stress levels.

Materials and methods

Participants

The study was carried out between 2019 and 2021. The women were selected based on the non-random snowball sampling model, in which participants recruited other participants for the study.

The study consisted of 224 postpartum women, of whom 124 were examined during the COVID-19 pandemic (between March and June 2021). The data obtained were compared with the results of examinations carried out prior to the pandemic (100 women were examined between February 2019 and May 2019). The women met the following inclusion criteria: primiparas, women with a singleton pregnancy, women up to 7 days postpartum, being at the age ≥ 18 years, no communication difficulties or a mental deficiency. The exclusion criteria were: previous childbirths and miscarriages, having a diagnosis of psychiatric disease (e.g., depression or/and anxiety disorders) and incomplete questionnaires.

The study was conducted in the form of anonymous questionnaires, without any intervention or experiment, with the consent of all participants.

Both groups were similar. However, they differed in the place of residence, length of delivery, method of pregnancy termination, type of employment, and physical activity during pregnancy. The detailed data are presented in Table 1.

Measurement

The study was carried out using the Perceived Stress Scale (PSS-10) and the Edinburgh Postnatal Depression Scales (EPDS). Sociodemographic data (e.g., age, marital status, education) and information concerning the women's pregnancy and childbirth were collected using the authors' questionnaire. That questionnaire also included questions about childbirth-related fears, sources of knowledge about childbirth and infant care, physical activity and participation in childbirth classes.

Table 1. Characteristics of two study groups (Student's *t*-test and χ^2 test)

Characteristic	COVID-19 (n = 124) mean ± *SD*	Pre-COVID-19 (n = 100) mean ± *SD*	p (Student's *t*-test)	Effect size Hedges' *g*
Age				
mean	29.68 ± 4.74	29.78 ± 4.34	0.4970	0.02
range	19–42	18–40		
The week of childbirth				
mean	39.23 ± 1.58	39.29 ± 1.80	0.4981	0.03
range	28–42	32–42		
Length of delivery				
mean	7.51 ± 7.78	4.42 ± 5.72	0.0302*	0.44
range	0–56	0–24		
Day after childbirth				
mean	3.94 ± 2.17	2.98 ± 1.35	0.2682	0.51
range	1–7	1–9		
	n (%)	n (%)	p (χ^2)	Cramer's *V*
Education				
vocational	13 (10.5)	6 (6)	0.2312	0.08
secondary or higher	111 (89.5)	94 (94)		
Type of employment				
employed – employment contract	109 (87.9)	73 (73)		
running a business	9 (7.3)	19 (19)	0.0142*	0.19
contract of mandate	6 (4.8)	8 (8)		
Marital status				
single	20 (16.1)	20 (20)	0.4521	0.05
in a relationship	104 (83.9)	80 (80)		
Residence place				
village	29 (23.4)	12 (12)		
city up to 100,000 people	27 (21.8)	8 (8)	0.0003*	0.27
city over 100,000 people	68 (54.8)	80 (80)		
Course of pregnancy				
normal	112 (90.3)	81 (81)		
abnormal	12 (9.7)	19 (19)	0.0446	0.13
Delivery				
physiological childbirth	71 (57.3)	38 (38)	0.0041*	0.19
Caesarean section	53 (42.7)	62 (62)		
Anaesthesia during childbirth				
yes	79 (63.7)	71 (71)	0.2488	0.08
no	45 (36.3)	29 (29)		
Attending birthing school				
yes	53 (42.7)	50 (50)	0.2786	0.07
no	71 (57.3)	50 (50)		
Physical activity during pregnancy				
yes	79 (63.7)	46 (46)	0.0080*	0.18
no	45 (36.3)	54 (54)		

* statistically significant values $p < 0.05$

The PSS-10 scale was used to assess the intensity of the subjectively perceived stress. The scale consists of 10 questions about the subject's thoughts and feelings related to the stressful experience in the last month. A respondent can obtain a score from 0 to 40 points. A score of 0–13 points is considered a low level of perceived stress, 14–19 points an average level of perceived stress, and 20–40 points a high level of stress [20].

The EPDS scale is a self-assessment questionnaire for detecting depressive symptoms in women after childbirth. The scale contains 10 questions for each of the last 7 days. A respondent chooses one of four responses from 0 to 3 according to the increasing severity of the symptoms that best describe their condition. The respondents can get a maximum of 30 points, where a score of ≥ 10 points may indicate the presence of emotional problems [21].

Statistical analysis

The measures of descriptive statistics, such as mean, standard deviation and percentages and amounts, were used for the qualitative variables and the normality of distribution was verified using the Kolmogorov–Smirnov test. Due to the normality of the distribution of the variables, the significance of the differences between the groups was confirmed using Student's t-test and the χ^2 test. Furthermore, to determine the effect size of the differences between the study groups, Hedges' g (due to the different sample sizes) and Cramér's V were used. A result ≥ 0.8 demonstrates a high, 0.5 a medium and 0.2 a small strength of the observed effect size. The assumed significance level was $p < 0.05$. Calculations were performed using Statistica 13.3 and PQ Stat 1.8.2.

Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Senate Commission for the Ethics of Scientific Research of the Wroclaw University of Health and Sport Sciences (reference No.: 40/2018.

Informed consent

Informed consent has been obtained from all individuals included in this study.

Results

In both analysed groups, the mean stress was at an average level (17.55 vs. 15.23). However, in the COVID-19 group, a significantly higher level of perceived

Table 2. PSS-10 and the ESDP results obtained before and during the COVID-19 pandemic (Student's t-test for independent groups)

Scale	COVID (n = 124) mean ± SD	Pre-COVID-19 (n = 100) mean ± SD	t	p	Effect size Hedges' g
ESDP	8.02 ± 5.96	7.54 ± 5.31	0.62	0.2676	0.08
PSS-10	17.55 ± 8.39	15.23 ± 6.93	2.21	0.0141*	0.30

ESDP – Edinburgh Postnatal Depression Scales, PSS-10 – Perceived Stress Scale
* statistically significant values $p < 0.05$

Table. 3. Comparison of PSS-10 and ESDP results –qualitative analysis (χ^2 test)

Scale	COVID (n = 124) n (%)	Pre-COVID-19 (n = 100) n (%)	χ^2	p	Effect size Cramer's V
ESDP results					
no depression (0–12 points)	102 (82)	80 (80)	0.02	0.9600	0.03
suspected depression (EDSP > 12)	22 (18)	20 (20)			
PSS-10 results					
low stress level	48 (39)	39 (39)			
average stress level	29 (23)	39 (39)	9.0	0.0111*	0.20
high stress level	47 (38)	22 (22)			

ESDP – Edinburgh Postnatal Depression Scales, PSS-10 – Perceived Stress Scale
* statistically significant values $p < 0.05$

stress was noted (Table 2). In this group, most of the women were experiencing high levels of stress. There were no statistically significant differences in the level of mood of the surveyed women and in the number of cases in which a depressed mood was found (Table 3).

In the group of women surveyed during the pandemic, significantly more fears were found concerning the new situation of motherhood as well as childbirth itself as a new task compared to the group of women surveyed before the pandemic (Table 4).

The women surveyed during the pandemic significantly more often used the Internet as a source of knowledge about childbirth, compared to the women surveyed before the pandemic, who were substantially more willing to read books to expand their understanding of the course of childbirth and future care of the infant (Table 5).

During the COVID-19 pandemic, significantly higher stress levels and significantly worse moods were recorded in the group of physically active women dur-

Table 4. Fears related to childbirth in both examined groups of women (χ^2 test)

Biggest concerns about childbirth	COVID-19 (n = 124) n	Pre-COVID-19 (n = 100) n	Total n	χ^2	p	Effect size *Cramer's V*
Pain	62	61	123	2.7	0.1000	0.11
Complications in childbirth	92	63	155	3.2	0.0712	0.12
Motherhood as a new situation	28	10	38	6.2	0.0126*	0.17
Childbirth as a new task	17	5	22	4.7	0.0294*	0.15
Hospital environment and staff	28	17	45	1.1	0.3000	0.06
I was calm and had no fear of childbirth	8	7	15	0.02	0.8703	0.01

* statistically significant values p < 0.05

Table 5. Sources of knowledge of the surveyed women about childbirth and infant care (χ^2 test)

Sources of knowledge about childbirth and baby care	COVID-19 (n = 124) n	Pre-COVID-19 (n = 100) n	Total n	χ^2	p	Effect size Cramer's V
Childbirth classes	50	44	94	0.3	0.5793	0.05
Books	56	59	115	4.2	0.0393*	0.14
Internet	92	57	149	7.3	0.0067*	0.18
Family/friends	69	45	114	2.5	0.1131	0.11
Experiences from previous births	41	39	80	0.8	0.3567	0.06

* statistically significant values p < 0.05

Table 6. Stress level and mood in the examined groups of women depending on physical activity during pregnancy (Student's t-test for independent groups)

Scale	Physical activity during pregnancy					Effect size Hedges' g
	n	yes mean ± SD	n	no mean ± SD	p	
PSS-10						
COVID-19	79	20.32 ± 8.18	45	16.78 ± 8.48	< 0.0001*	0.43
pre-COVID-19	46	14.83 ± 6.75	54	15.61 ± 7.09	0.2894	0.11
p /effect size		0.0009* / 0.44		0.0862 / 0.16		
ESDP						
COVID-19	79	9.20 ± 6.36	45	8.18 ± 7.15	0.0017*	0.25
pre-COVID-19	46	6.78 ± 5.11	54	7.51 ± 5.49	0.0960	0.26
p / effect size		0.0159*/ 0.41		0.0156*/ 0.11		

ESDP – Edinburgh Postnatal Depression Scales, PSS-10 – Perceived Stress Scale
* statistically significant values p < 0.05

ing pregnancy compared to the physically inactive women.

Statistically significant differences were also found in the level of stress and mood between the physically active women from the COVID-19 group and the physically active women from the pre-COVID-19 group. Also, the physically inactive women surveyed during the pandemic had a significantly worse mood compared to their peers surveyed before the pandemic (Table 6).

Discussion

The rapid spread of the SARS-CoV-2 virus led to the COVID-19 pandemic, which significantly impacted the health and life of societies. Restrictions and procedures were introduced to ensure safety and adapt to the sanitary and epidemiological requirements. The new rules radically changed the functioning of patients and medical staff in hospitals, including during the hospitalisation of women in the perinatal period. The restrictions limited or completely prevented contact of patients with their families, as a result of which family deliveries were suspended in many hospitals. Numerous publications indicate the adverse impact of the COVID-19 pandemic on the emotional state of women during pregnancy and the postpartum period [13, 14, 22, 23–26].

In the group of women in the early postpartum period studied during the COVID-19 pandemic, a significantly higher level of perceived stress was noted. In this group, most of the women were experiencing high levels of stress.

There are few studies analysing the level of anxiety, stress and depression in women in the early postpartum period during the COVID-19 pandemic. Much more reports concern the analysis of the emotional state of pregnant women, which also showed that the COVID-19 pandemic was a significant stress factor [13, 14]. In the study by Iwanowicz-Palus et al. [14], conducted during the first wave of the COVID-19 pandemic in Poland, most pregnant women were characterised by at least an increased level of perinatal anxiety. The respondents claimed that the epidemiological situation contributed to increased anxiety [14]. This was also confirmed by Ahmad and Vismara [24], who observed that the anxiety level in pregnant women increased during the pandemic compared to the period before the epidemic.

Due to the difficult access to in-person perinatal education during the COVID-19 pandemic, women could use online childbirth classes or obtain information independently from other sources, such as the Internet. Previous reports indicate that perinatal education has a significant impact on the emotional state of women. Both in-person and online education reduce pregnancy-related stress and anxiety [27–29].

This study showed that women during the pandemic significantly more often used the Internet as a source of knowledge about childbirth than the women surveyed before the pandemic, who were substantially more willing to read books to expand their knowledge about the course of childbirth and future care of the infant. This could also be a factor that increased the stress levels in the surveyed women. The Internet is a source of professional and scientifically confirmed knowledge, but also of common, misleading information. Access to opinions and experiences and everyone's ability to post them and express them anonymously can be supportive. Still, it can also be a factor that increases anxiety and fear [29]. This was particularly noticeable during the pandemic when a new and surprising situation generated increasingly much different, changing and divergent information online about the virus, pandemic, vaccinations and complications [26].

The main concerns of pregnant and postpartum women during the pandemic were the deterioration of obstetric care standards, a reduction in their economic situation, SARS-CoV-2 infection and its impact on the child's health [13, 24]. The information chaos accompanying the pandemic and the lack of consistent and confirmed information on the impact of infection on pregnancy further increased perinatal fears [26]. The above research results allowed us to assume that similar fears could also accompany women in the early puerperium period, depressing their mood and generating stress.

In the group of women surveyed during the pandemic, the most common fears concerned the new situation of motherhood and childbirth itself as a new challenge. Similarly, in the study by Tułacz et al. [13], childbirth during the pandemic was a challenge for the respondents since the restrictions made it difficult for relatives to be present.

Physical activity is considered an equally important aspect of the health of the mother and her child. The benefits of taking it can also be observed in the emotional sphere of women in the perinatal period. Numerous authors indicate that physical activity reduces the level of stress and improves the mood, and also reduces the risk of postpartum depression [19, 30, 31]. In addition, physical activity before pregnancy and childbirth education is considered to be among the factors

that most significantly reduce perinatal anxiety [12]. In the group of active women surveyed during the COVID-19 pandemic, significantly higher stress levels and significantly worse moods were recorded compared to the physically inactive women. This result may be surprising. The lack of consistency in the findings between the studies makes it difficult to draw firm conclusions about the obtained results. Nevertheless, it is likely that the stress caused by the pandemic in women with a more fearful personality but aware of the benefits of exercise became a mobilising factor to take up physical activity to prevent its adverse effects. In addition, taking into account the result that the physically inactive women from the COVID-19 group also had a significantly worse mood compared to the women from the Pre-COVID-19 group, it can be assumed that the pandemic as a high-stress factor could offset the beneficial effect of physical activity on the well-being of the respondents.

The obtained results lead to reflection on the relationship between the undertaken physical activity, the situation of the COVID-19 pandemic and the emotional state of women in the postpartum period, but it should be noted that they have certain limitations. One of them is the screening nature of stress and mood studies, which is not tantamount to a diagnosis. Caution should be exercised in generalising the results, especially because of the group size. Physical activity during pregnancy was recorded using a questionnaire in which women declared that they had undertaken it during pregnancy. Therefore, in the future, a questionnaire to study physical activity (e.g., Polish version of the Pregnancy Physical Activity Questionnaire) should be used.

Conclusions

In the group of women surveyed during the COVID-19 pandemic, significantly higher stress levels and significantly more cases of high stress were recorded compared to those surveyed before the pandemic.

There were no statistically significant differences in the mood level or the number of cases in which a depressed mood was found.

The women declaring physical activity during the pandemic were characterised by a significantly higher level of stress and worse mood compared to the physically inactive women and compared to the physically active women surveyed before the pandemic.

Regardless of the research results, providing women with comprehensive perinatal care is essential, irrespective of the existing epidemiological situation in a given country.

Disclosure statement

No author has any financial interest or received any financial benefit from this research.

Conflict of interest

The authors state no conflict of interest.

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