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THE BIOPSYCHOSOCIAL STATUS OF WOMEN DURING THE ANTEPARTUM PERIOD

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A – study design, **B** – data collection, **C** – statistical analysis, **D** – interpretation of data, **E** – manuscript preparation, **F** – literature review, **G** – sourcing of funding

ABSTRACT

Background: The time leading up to delivery significantly affects the state of a pregnant woman in each of the spheres of human functioning.

Aim of the study: The aim of the study was to assess the biopsychosocial status of women in the antepartum period.

Material and methods: The study was carried out in St. Queen Jadwiga's Clinical Regional Hospital No. 2 in Rzeszow. The study group consisted of 200 women awaiting delivery: 100 preparing for physiological delivery, and 100 qualified for elective Caesarean section. The following tools were used: Labor Anxiety Questionnaire, Social Support Scale, Sources of Social Support Questionnaire, Short-form McGill Pain Questionnaire, and the questionnaire developed by the author.

Results: Statistical analyses showed a relationship between the biopsychosocial status of pregnant women and the planned mode of delivery. In turn, the sense of availability of social support was influenced by the place of residence and living conditions, the number of people cohabiting with the respondent, and the number of people with whom they maintained contact with during pregnancy. However, the occurrence of somatic complaints was found to be associated with the level of labor anxiety.

Conclusion: The biopsychosocial status of women in the antepartum period is influenced by many factors. Proper social relations positively influence psychological well-being, which in turn is closely related to the lack of pain sensations in the biophysical sphere.

KEYWORDS: pregnancy, status biopsychosocial, antepartum period, support, anxiety

Background

For many years, the traditional biomedical model, which focused mainly on somatic disorders when it comes to the functioning of the human body, dominated the field of treating diseases and understanding health,. This line of thought was based on the Cartesian assumption of duality, and the separation of the body from the psyche. The recognition of health in such categories lasted until nearly the mid-twentieth century. At that time, the challenge for this model was that research, conducted by representatives of behavioral and social sciences, proved that the model had many limitations and did explain many issues, including why different people, whose physical condition was similar, coped with the disease in completely different ways. It was stated that in order to understand pathogens, and develop both treatment methods and health care systems in a rational manner, the following should also be taken into consideration: the patient's social context, the environment in which the patient lives, as well as the complementary systems created by society to cope with the results of diseases. The presence itself of biological disorders does not explain the symptoms experienced. The human organism is an indivisible whole of symbiotic biopsychosocial aspects that are in constant interaction with the natural, social, and cultural environment [1,2].

The scientific concept of treating health in a multidimensional manner has become the basis for the World Health Organization's formulation of the commonly used definition of health, which is treated as a state of complete physical, mental, social, and spirit-

ual well-being, not just the lack of disease or disability. The definition relates to any human being at different stages of life. One of them is pregnancy, during which a woman's health is of great importance for the development of the fetus, the course of labor, and the mother's well-being in the postpartum period [3].

Pregnancy is a complex phenomenon that involves morphological and physiological processes, as well as psychological changes. During this period, life goals and the hierarchy of values change [4,5]. The dynamics of the emotional processes experienced by a woman is very intense, from the very beginning of pregnancy to its end, and depends on many factors. The pregnancy itself is a highly emotional situation, and when additional stressors comes along, it may be accompanied by ambivalence of sensations and other mental disorders [4,6]. One of the factors that can cause stress is the time of the upcoming delivery. Among many women, this situation may be expressed as antenatal anxiety, which many researchers consider to be the most important psychological variable modifying the course and quality of pregnancy, delivery, and the postpartum period [7].This anxiety can express itself both in vegetative and somatic disturbances, as well as behavioral disturbances [4,8]. During labor, in women who have given birth previously, anxiety increases, sometimes causing unreasonable efforts to end pregnancy earlier by Caesarean section, even in the absence of indications for this procedure. In order to maintain balance in functioning of the biological and psychological spheres, support and acceptance from society seems to be important; it creates a sense of security and minimizes the risk of complications [4,9,10]. The growing problem of the increasing percentage of Caesarean sections is the primary driver of research on the biopsychosocial state of pregnant women in the antenatal period, so that we may gain a greater understanding of the issue, identify the factors leading to disorders, and determine the risk groups.

Aim of the study

The aim of the study was to investigate the biopsychosocial status of women in the antepartum period.

Material and methods

Study design

A prospective cohort study was conducted in St. Queen Jadwiga's Clinical Regional Hospital No. 2 in Rzeszow (Poland) during 2016 and 2017. Consent was obtained for conducting the study from the Bioethics Committee of the University of Rzeszow (No. 12/2015).

Participants

Study group B consisted of 200 women waiting for delivery. B-I cohort comprised 100 women preparing for delivery through natural passages and natural labor. Cohort B-II comprised 100 women qualified for an elective Caesarean section.

Inclusion criteria:

a. a pregnant woman awaiting delivery through natural passages and natural labor or qualified for an elective Caesarean section,
b. a patient in the antepartum period, up to 7 days before the estimated date of delivery, determined on the basis of the last menstrual period in accordance with the Naegele's rule and confirmed by ultrasound in the first trimester of pregnancy,
c. a patient verbally responsive, informed consent to participate in the study granted,
d. a correctly completed questionnaire.

The study excluded women who were diagnosed with a history of mental disorders and concomitant pain caused by a chronic somatic disease requiring analgesics.

Table 1. Indication for an elective Caesarean section in cohort B-II.

Reason for an elective Caesarean section	N	Percent
Abnormal fetal lie/position	15	15.0%
Bigeminal/multiple pregnancy	7	7.0%
Previous Caesarean section and the risk of a natural labor	60	60.0%
Diseases during pregnancy and complicating its course	6	6.0%
Diseases diagnosed before pregnancy	12	12.0%
Other	10	10.0%

Data sources/measurement

The following standardized tools were used in the diagnostic poll:

a. Labor Anxiety Questionnaire (KLP II),
b. Short-form McGill Pain Questionnaire (SF-MPQ),
c. Social Support Sources Questionnaire prepared by Michael Nieland (Polish translation by Eleonora Bielawska-Batorowicz),
d. Danuta Zarzycka's Social Support Scale.

An additional element of the study was the authors' own questionnaire, which enabled the collection of socio-demographic data and information on obstetrics and gynecological history of the respondents.

Statistical analyses

Statistical analysis of the collected data was conducted in Statistica 13.1 (Statsoft). Both parametric and non-parametric tests were used to analyze the variables. The choice of the parametric test was determined by the fulfillka' Student' women. Nowakowska ment of its basic assumptions, i.e., the distribution of the examined variable was normal, which was verified with the use of the Shapiro-Wilk test. In order to evaluate the differences at the average level of the quotient in two populations, the Student's t-test (t) for independent

variables was used or alternatively, the non-parametric Mann-Whitney (Z) test was used. The correlation of two variables that were not normally distributed was determined with the use of the Spearman's rank correlation coefficient (R). To assess the relationship between the selected variables for questions on nominal scales, V Cramer and Phi tests (2x2 tables) were used. These are symmetrical measures that are based on the chi test – Pearson square (χ^2), illustrating the strength of the relationship between the variables in the cross tables. Descriptive statistics were calculated for numerical variables, i.e., arithmetic mean (), median (Me), minimum (Min), maximum (Max), lower quartile (Q1), upper quartile (Q3) and standard deviation (SD). The level of statistical significance was $p<0.05$.

Results

Characteristics of the study group

The characteristics of the most prevalent socio-demographic data in the studied cohorts are presented in Table 2. The differences in the data were not statistically significant in the studied groups.

Table 2. Characteristics of the studied group

Socio-demographic data		Cohort B-I		Cohort B-II	
		N	Percent	N	Percent
Age	26-35	68	68.0%	67	67.0%
Marital status	Married	92	92.0%	89	89.0%
Place of residence	Countryside	60	60.0%	55	55.0%
Education	Secondary	41	41.0%	34	34.0%
	University degree	39	39.0%	47	47.0%
Professional activity	Working	73	73.0%	68	68.0%
Living conditions	Good	64	64.0%	68	68.0%

Main results

Analyzing the obstetrics history of these women, primiparas were more frequently recorded in cohort B-I, while multiparas were found more often in cohort B-II. These results were statistically varied. Women preparing for spontaneous delivery statistically more often had natural labor with perineotomy, whereas those from cohort B-II were statistically more likely to have Caesarean sections performed.

Statistically, more social support in the antepartum period was sought-after by the respondents from cohort B-II (Table 4). Support received was maintained at the same level in both groups, and the level of satisfaction with the received social support was higher in cohort B-II (p=0.011). The results concerning the evaluation of available support were statistically slightly higher for women from cohort B-II (p<0.001).

The analysis of social support sources revealed that women from cohort B-II received support from doctors and midwives working in the hospital more often than women from cohort B-I (p=0.048), as well as from their own older children (p=0.001).

Among the selected factors, the living and housing conditions of the respondents had a significant impact on the level of available social support in both cohorts. The better the living conditions of the respondents, the higher the assessment of available social support (B-I: p=0.008, B-II: p=0.009). The same applied to the number of people with whom respondents maintained contact (B-I and B-II: p<0.001). Moreover, cohort B-II showed a statistically significant influence of the place of residence on the level of available social support. Respondents who lived in the city (p=0.008) and those living with a larger number of people (p=0.046) had a greater sense of availability of social support. The number of previous deliveries had no significant impact on the sense of availability of social support experienced by the respondents from both groups (B-I: p=0.571, B-II: p=0.348).

Table 3. Obstetrics history in the studied cohorts

Obstetrics history		Cohort B-I		Cohort B-II		P
		N	Percent	N	Percent	
Number of deliveries	First	52	52.0%	28	28.0%	$\chi^2(1)=12.00$ p<0.001 Phi=0.24
	Subsequent	48	48.0%	72	72.0%	
Miscarriages	Yes	18	18.0%	16	16.0%	$\chi^2(1)=0.14$ p=0.706
	No	82	82.0%	84	84.0%	
The course of previous deliveries	Delivery without perineotomy	10	10.0%	4	4.0%	$\chi^2(1)=2.76$ p=0.096
	Delivery with perineotomy	39	39.0%	8	8.0%	$\chi^2(1)=26.72$ p<0.001 Phi=-0.36
	Delivery with perineal rupture	3	3.0%	0	0.0%	$\chi^2(1)=3.04$ p=0.080
	Instrumental delivery (forceps, VE)	0	0.0%	1	1.0%	$\chi^2(1)=1,00$ p=0.316
	Caesarean section	6	6.0%	68	68.0%	$\chi^2(1)=82,45$ p<0.001 Phi=0.64

χ^2 – Pearson's chi-squared test.

Table 4. Social support in the antepartum period, desired by the respondents

Desired support	Descriptive statistics [points]							
	N	$\bar{x}$	Me	Min.	Max.	Q1	Q3	SD
Cohort B-I	100	36.65	36.00	20.00	56.00	33.00	41.00	6.87
Cohort B-II	100	38.89	39.00	26.00	56.00	35.00	42.00	6.03
p	t=-2.45 p=0.015							

t – Student's t-test.

A statistically higher level of anxiety was observed among women in group B-I (Table 5). No significant statistical relationship between basic socio-demographic data and the level of labor anxiety was observed. The qualitative assessment of the level of labor anxiety in the studied cohorts did not reveal any statistically significant differences. The majority of study participants were characterized by low or average level of labor anxiety (in B-I and B-II: 62% and 69% respectively). Furthermore, the women studied from cohort B-I, more than respondents from cohort B-II, feared that their labor would be long and painful, but they indicated that afterwards they would quickly return to their pre-pregnancy condition (Table 6).

Table 5. Level of labor anxiety in the studied groups

Level of labor anxiety [0-27 point scale]	Descriptive statistics [points]							
	N	$\bar{x}$	Me	Min.	Max.	Q1	Q3	SD
Cohort B-I	100	12.85	13.00	7.00	20.00	11.00	15.00	2.69
Cohort B-II	100	11.90	12.00	4.00	20.00	10.00	14.00	3.08
p	t=2.32 p=0.021							

t – Student's t-test

Table 6. The attitude of respondents to the statements contained in the labor anxiety questionnaire

KLP II point: 3 – definitely not 2 – probably not 1 – probably yes 0 – definitely yes	Cohort B-I			Cohort B-I			Z	p
	$\bar{x}$	Me	SD	$\bar{x}$	Me	SD		
I am afraid my labor will be long	0.98	1.00	0.74	1.81	2.00	0.85	-6.62	<0.001
I know that during the birth, I will be in complete control of the situation	1.41	1.00	0.64	1.49	2.00	0.72	-1.01	0.310
I am worried that my baby may be born with some kind of defect	1.80	2.00	0.70	1.69	2.00	0.72	1.05	0.292
I feel that there will be some unforeseen complications in the delivery	1.83	2.00	0.59	1.74	2.00	0.69	1.00	0.316
I am convinced that during childbirth I will be calm and composed	1.64	2.00	0.72	1.45	1.00	0.74	1.83	0.067
I am afraid my labor will be painful	0.66	1.00	0.64	1.09	1.00	0.87	-3.63	<0.001
I am convinced that I will recover quickly after giving birth	1.94	2.00	0.58	1.69	2.00	0.72	2.48	0.013
I am concerned that my baby may be damaged in childbirth	1.90	2.00	0.64	2.04	2.00	0.62	-1.60	0.109
Waiting for the birth is a very happy time for me	1.99	2.00	0.82	2.10	2.00	0.92	-1.12	0.263

Z – Mann-Whitney U test

Considering the number of previous deliveries, the level of anxiety was higher in women preparing for their first labor, regardless of the planned method of delivery. However, these differences were not statistically significant (B-I: p=0.330, B-II: p=0.130). The previous method of delivery and current indications for Caesarean section did not affect the level of labor anxiety.

Table 7. Level of labor anxiety in respondents based on their sense of availability of social support

Variables	R	p
Cohort B-I	0.03	0.747
Cohort B-II	-0.28	0.005

R – value of Spearman's rank correlations.

In the assessment of the relationship between the level of labor anxiety and available social support, a statistically significant dependence was described for respondents from cohort B-II. Greater social support among women from this group was associated with a lower level of labor anxiety (R=-0.28), (Table 7).

Table 8. Current pain intensity in respondents based on Current Pain Intensity Scale

Pain [0-100 point scale]	Descriptive statistics [points]							
	n	$\bar{x}$	Me	Min.	Max.	Q1	Q3	SD
Cohort B-I	100	22.72	19.00	0.00	100.00	4.00	31.50	22.62
Cohort B-II	100	20.16	16.50	0.00	73.00	2.00	33.50	19.80
p	Z=0.75 p=0.451							

Z – Mann-Whitney U test

In Current Pain Intensity Scale, women from cohort B-I showed higher levels of pain intensity, but the difference was not statistically significant (Table 8). In assessing the nature of pain felt, women from cohort B-I reported piercing pain statistically more often than women from cohort B-II (p=0.032).

Comparative analysis of the intensity of pain felt in all participants, depending on the somatic symptoms accompanying them, showed statistically significant relationships for the following symptoms: breathlessness/dyspnea (p=0.037), heat/sweating (p=0.048), sleeping disorders (p=0.005), coldness (p=0.008), and between those experiencing any symptoms and those not experiencing them at all (p=0.009). Higher levels of pain intensity was observed among respondents reporting the presence of the above-mentioned somatic symptoms.

The level of intensity of childbirth anxiety among women reporting various somatic symptoms during pregnancy was considered. In cohort B–I, women complaining of breathlessness or shortness of breath, as well as trembling hands and muscles, experienced statistically significantly higher levels of labor anxiety than those who were not concerned by this problem. In cohort

B–II, women reporting a feeling of heat, sweating, sleep disturbances and other ailments (diarrhea and heartburn) experienced statistically significantly higher levels of labor anxiety than those who did not experience this problem. It was also noticed that a significantly lower level of anxiety was found among women who did not experience any somatic symptoms (Table 9).

Table 9. Level of labor anxiety and accompanying other somatic ailments – comparison in cohorts

	Physical symptoms associated with the upcoming delivery	p
Cohort B-I	Palpitations/chest pain	Z=-0.54 p=0.584
	Breathless/short of breath	Z=-2.08 p=0.037
	Feeling hot/sweating	Z=0.47 p=0.633
	Stomach pains. lack of appetite	Z=-0.04 p=0.966
	Nausea, vomiting	Z=-0.70 p=0.482
	Headaches	Z=-0.99 p=0.320
	Sleep disturbance	Z=-1.16 p=0.243
	Turning red	Z=-0.89 p=0.372
	Tremors in hands and muscles	Z=-2.07 p=0.038
	Dry mouth	Z=0.50 p=0.613
	Feeling cold	Z=1.76 p=0.077
	Other	Z=0.15 p=0.876
	No symptoms	Z=-0.57 p=0.563
Cohort B-II	Palpitations/chest pain	Z=1.55 p=0.120
	Breathless/short of breath	Z=-1.82 p=0.068
	Feeling hot/sweating	Z=2.63 p=0.008
	Stomach pains, lack of appetite	Z=0.29 p=0.769
	Nausea, vomiting	Z=1.55 p=0.119
	Headaches	Z=-0.76 p=0.445
	Sleep disturbance	Z=-2.22 p=0.025
	Turning red	Z=0.00 p=1.000
	Tremors in hands and muscles	Z=0.95 p=0.340
	Dry mouth	Z=1.48 p=0.137
	Feeling cold	Z=-0.80 p=0.420
	Other	Z=-2.60 p=0.009
	No symptoms	Z=3.82 p<0.001

Z – Mann-Whitney U test

Discussion

This study confirms the presence of anxiety in women in the antepartum period. For all respondents, the intensity of labor anxiety was average, comparable to the results of Dembińska et al. [8]. The effects of the authors' own work were also confirmed by the findings of Marylowska-Topolska et al., and Szymański et al., who observed that the highest percentage of women reporting anxiety before delivery concerns those who are in the final stage of pregnancy [11,12]. It may be observed that anxiety during pregnancy is a natural phenomenon, but the perspective of an approaching delivery significantly increases its intensity.

In the authors' own research, the verification of the occurrence of labor anxiety in terms of the planned method of delivery proved interesting; significantly higher levels of labor anxiety were observed in women preparing for spontaneous delivery. The authors' own findings are confirmed by the study of Kang et al., conducted in China, which revealed that anxiety at the end of pregnancy was clearly related to vaginal delivery [13]. This is a view shared by other researchers as well; although Dembińska does not mention any significant differences in the analysis of labor anxiety and the expected method of delivery, she indicates that a high level of anxiety before delivery is significantly associated with the desire to have a Caesarean section performed [8]. Størksen et al., based on studies conducted in Norway, are of a similar opinion [14]. Comparable conclusions were also formulated by Saisto and Halmesmäki [15]. These results may be explained by a common misconception among women regarding the safety and painlessness of Caesarean sections.

The characteristics of anxiety among pregnant women in the antepartum period specified in the authors' own studies are consistent with the results obtained by other authors [8,16]. Bączyk et al., also emphasized that a significant factor affecting the presence of labor anxiety was the fear that a child would be born in poor condition [16].

Considering the parity and the level of labor anxiety, a slightly higher degree of anxiety was observed in the group of women preparing for their first delivery, regardless of the planned method of delivery. The same results were obtained by researchers from India, who observed a higher level of labor anxiety in nulliparas [17,18]. It can be assumed that previous obstetrics experiences do not have an impact on the labor anxiety, and every subsequent delivery is a new challenge for a woman. Similar conclusions were also reached by Szymański et al., Błaszczak et al., and Kazimierczak et al. [4,12,19]. However, these data contradict the results of research conducted by psychologists from Katowice (Poland). They reported that memories of previous deliveries statistically significantly affect the level of anxiety during current pregnancy. These conclusions were also confirmed by Rouhe et al., in studies conducted in Finland; the authors observed much higher levels of anxiety in multiparas who experienced instrumental deliveries in the past [20]. Dissimilarity of presented results may be attributed to cultural differences.

A surprising effect of the authors' own studies was the level of pain and discomfort reported by the respondents in the antepartum period, and the link between these ailments, the planned delivery, and mental functioning of these women. Well-being decline in terms of physical signs was statistically more frequently reported by patients preparing for vaginal delivery. These data represent innovative knowledge, as no similar publications have been found in the available literature. The results obtained in this respect suggest the hypothesis

that pregnancy, although it is a physiological state, may be the cause of deterioration in the functioning of the female biological sphere, regardless of its duration.

In the above-mentioned problem of pain sensations, the synthesis of the authors' own material revealed that the relationship between the obstetrics history and the planned method of delivery is not without significance. The ailments reported by both cohorts of pregnant women were statistically different, but a common feature was the more frequent occurrence of problems in parturients with a lower number of previous deliveries. Existing somatic symptoms may be an expression of the mother's fear of an approaching delivery and concern about the health of the baby to be born. Current scientific reports do not confirm the above implications since there is no research in this regard.

In terms of social support, higher expectations towards the society and better evaluation of the support obtained were observed among patients qualified for Caesarean sections. Gebuza et al. also acknowledged that women after Caesarean sections received significantly more social support during pregnancy [21]. As far as the sources of support are concerned, both groups of respondents paid special attention to the key role of the closest family, while women planning a Caesarean section additionally emphasized the assistance of doctors and midwives from the hospital, as well as support received from their children. Offspring, indicated as a source of support, most probably results from the fact that there were more multiparas in this group of women. Nowakowska-Gołąb et al., investigating the impact of social support on the quality of life of pregnant women in Łódź (Poland), also stressed the supportive role of the family. The authors also confirmed their own results concerning the impact of the place of residence and other people on the reported greater availability of social support [22]. The number of available studies on the subject is limited. The risk of complications, including postnatal depression, in women who do not receive social support during pregnancy is very high. The results obtained in the authors' own study are therefore worthy of special attention. Statistically higher level of support indicated by women qualified for Caesarean sections living in urban areas can be explained by the better accessibility and ease of use of support from selected groups and institutions in urban conurbations.

The study also analyzed the significance of social support in the context of labor anxiety. It is commonly accepted that adequate social support contributes to reducing the level of negative emotions, and thus improving the mental state of pregnant women. In the authors' own study, a significant correlation in this respect was observed in the group of women qualified for an elective Caesarean section. A considerable number of researchers support the effects of the presented results indicating that the lack of social support contributes to labor anxiety [8,13,23–27]. A review of studies confirms that disturbed interpersonal relations reduce self-esteem in pregnant women, increase stress, and cause pain and depression symptoms during pregnancy [6,28,29].

The analysis of the impact of the number of previous deliveries on the level of social support in the current pregnancy also deserves attention; the authors' studies do not confirm this correlation. These results are inconsistent with the reports of other researchers. The work of Gebuza et al. showed that significantly more emotional and instrumental support in the peripartum period was received by primiparas than multiparas [10]. Nowakowska-Gołąb et.al. demonstrated that the number of supportive persons was lower for women already having children [22]; this difference is difficult to explain.

The results of these studies are significant not only because of the absence of such data in Poland and worldwide, but above all because they indicate that the planned method of delivery may be a significant cause of the altered functioning of women in the antepartum period. Understanding the needs and mechanisms of certain behaviors of women waiting for a baby to be born in the near future is the first step to improving the quality of life of these patients. Additionally, these results may contribute to changing women's preferences regarding the method of delivery.

Limitations of the study

The problem of assessing the biopsychosocial state of patients in the antenatal period has been resolved, to a large extent. One may be unsatisfied when considering the fact that the results in some of the issues raised for both groups were insignificant, although the obtained values of the probability index were approaching statistical significance. It is also unsatisfactory that in selected cases, despite the fact that correlations between the selected variables turned out to be statistically significant, the strength of their relationship was relatively weak. An increased number of respondents would possibly enable us to distinguish the tendency from the randomness of behavior of women expecting childbirth, as well as point out more clearly the factors that determine their biopsychosocial state.

Conclusions

1. Compared to women awaiting an elective Caesarean section, patients who are qualified for delivery through natural passages and natural labor experience higher levels of anxiety.
2. Pregnant women need social support. Patients who feel that social support is available to them have a lower level of labor anxiety.
3. The intensity of pain and somatic symptoms in women in the antepartum period is determined by their mental well-being.
4. It is essential to prepare medical personnel to recognize the needs of women awaiting delivery in terms of their biopsychosocial functioning.

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