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Psychological profile and mood disturbance of women who gave birth during the COVID-19 pandemic in Romania

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ABSTRACT

Objective: This study aimed to outline the emotional profile and the mood disturbance of women who gave birth during Emergency and Alert states in Covid-19 pandemic.
Methods: A cross-sectional study was carried out to investigate how the emergency and alert states due to Covid-19 affected the emotional profile and the mood disturbance of pregnant women who gave birth during these times. We included 244 postpartum women, divided into two groups: 124 women during the State of Emergency and another 120 women during the State of Alert. After expressing their informed consent, they completed an anonymous questionnaire that collected demographic data and the Profile of Mood States Questionnaire, as well as a follow-up survey. Data analysis was performed using the statistical program SPSS 24.0.
Results: Out of the 300 questionnaires distributed, we collected 244 valid questionnaires. 45.2% of State of Emergency group and 53.3% of State of Alert group experienced Anxiety, 16.9% of State of Emergency group, respectively 18.3% of State of Alert group, Depression, and 25% of State of Emergency group respectively 34.2% of State of Alert group, Distress. Compared to the ideal Iceberg profile, the emotional profile of both groups presented an inverted graph for Anxiety and Depression and much lower values for Vigor. Only 35.5% of State of Emergency group and 16.7% of State of Alert group received information concerning the virus, symptoms, and evolution of the disease from the specialists who monitored their pregnancy and 25.8% of State of Emergency group respectively 11.7% of State of Alert group received information about measures to prevent contamination and infection. Psycho-emotional and mood disturbance was more pronounced among State of Alert group.
Conclusions: There was a significant psycho-emotional alteration of surveyed women during the pandemic, worsened by the radical measures of the State of Emergency and associated with the major deficiency of care services in supplying valid information and counseling for pregnant women's safety in the State of Alert. There is a highlighted need to pay more attention to the psychological profile of pregnant women and to modernize the health services in this field and adapt them to pandemic situations with the use of modern virtual techniques. In addition, the Romanian health care system should round off the team responsible for the care of mother and child with midwives, internationally recognized very skilled in informing, monitoring, counseling, and support in this field.

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Introduction

The COVID-19 pandemic has been and continues to be a major threat to the physical and mental health (Pfefferbaum and North, 2020). The aggressiveness and mutagenic potential of the new coronavirus has hampered global health systems, forcing governments to adopt extreme, unusual attitudes, that conflict with human and social freedoms, with a psychological impact on the entire population (Kringos et al, 2020).

On March 16th, 2020, Romania declared a State of Emergency until May 14th, which meant the prohibition of free movement and therefore the impossibility of pregnant women to physically receive help from prenatal consultations (Presidential Decree no. 195, 2020). In Romania, by law, primary perinatal healthcare services are provided on a contract with the National Health Insurance House by family physicians/general practitioners (Pop et al., 2020) and the specialized outpatient care by obstetricians (Law no. 95, 2006). Midwives, recognized worldwide as the most appropriate providers in primary perinatal care and the main psycho-emotional supporters of the childbearing women (Renfrew and Malata, 2021), were excluded from the maternal and child healthcare team by the system decentralization (WHO Regional Office for Europe, 2012). In this pandemic situation, a government decision regulated the provision of remote medical care by family physicians and specialists in the outpatient clinic using any means of communication, with a maximum of 8 consultations / hour (Guvern Decision no. 438, 2020). The absence of a telemedicine platform, an exercise for remote communication through modern technical means, panic and case ancestry associated with the pandemic took by surprise the Romanian health system, which led to overcrowding and blockage of primary care and implicit neglect of prenatal services. According to the Romanian Guvernment's Decision no. 394, 2020, the Emergency State was replaced by the Alert state and the Law no. 55, 2020, regarding certain measures set in place to prevent and combat the effects of the COVID-19 pandemic was published. Through the Minister's Order No. 828, 2020, the outpatient clinics and private offices were reopened, but with the mandatory stipulation that infection prevention and control measures must be followed. Due to the epidemiological situation caused by the SARS-CoV-2 virus, Romanian family physicians were overwhelmed by cases. This fact, along with the restrictions imposed, reduced their services potential in the antenatal field. On the other hand, pregnant women restricted themselves to monitoring visits to the family doctor or obstetricians, thinking that in this way they reduced their risk of becoming infected. Several studies suggested that the lockdown, the alert restrictions measures, fear of contracting the virus and its possible effects on pregnancy, inadequate antenatal care and misinformation could be responsible for anxiety and depression symptoms during the COVID-19 pandemic (Perez et al., 2022; Liu et al, 2021; Mayopoulos et al., 2021). Also, the restriction of social support surrounding childbirth and the separation of newborns from their mother were incriminated, but in Romania the separation of the two was already a regular practice and the presence of a partner or someone from the family wasn't allowed in the delivery room, even before this pandemic. Moreover, the quality of maternal and newborn care worldwide has been affected and this also could be considered an important factor in the imbalance of the psychological status of women who gave birth during the pandemic (Lazzerini et al., 2022). During the Covid-19 pandemic, researchers from all over the world paid more attention to maternal mental health, and most showed that it had a significant impact even though different types of psychological tools were used and were applied in different maternal stages and in different geographical, social, and cultural places (Perez et al., 2022; Liu et al, 2021; Mayopoulos et al., 2021).

A study conducted in Romania before the pandemic already showed a prevalence of 32%–38% of negative emotions symptoms among pregnant women (Wallis et al., 2012), higher, compared to the prevalence identified (30%) in other international studies (Ahmad and Vismara, 2021). However, although studies have shown an increase in the psycho-emotional vulnerability of pregnant women in potentially life-threatening situations, no action has been taken in this regard (Riyad Fatema et al., 2019). This study aimed to outline the emotional profile and the mood disturbance of women who gave birth during Emergency and Alert states in Covid-19 pandemic.

Materials and methods

We conducted an anonymous descriptive, cross-sectional study in Buzau County maternity, Romania. Out of 300 women at 2 days postpartum initially included, we collected 244 valid answers. We created two groups: 124 women during the State of Emergency, from April - May 2020, and 120 women during the State of Alert, from October - November 2020. As a psychometric tool we used a Shortened Version of the Profile of Mood States (DiLorenzo et al., 1999), accompanied by a 14-items questionnaire for collecting demographic data and monitoring pregnancy. The average time required of women surveyed to complete the questionnaire was 15 min.

POMS is a self-report questionnaire widely used for retrospective measuring mood states and levels of psychological distress. The original version formulated by McNair et al. (1971) consisted of 65 items and six subscales: Anxiety, Depression, Anger, Vigor, Fatigue and Confusion. POMS has been used for over 40 years, translated into 42 languages, and adapted to different needs (Boyle et al., 2015). The Shortened Version of the Profile of Mood States (POMS-SV) consists of 47 items and retains the six subscales of the longer version: For each item, women surveyed indicated on a 5-point scale ("0 = not at all" to "4 = very strong") the degree to which an adjective describes feelings experienced during the past two week. The total psychological distress score is calculated by summing the negative emotions scores and the TMD score (Total Mood Disturbance) represents the degree of disturbance of the general mental state or the level of total distress and is obtained by subtracting the score obtained at subscale Vigor from the sum of the scores obtained at the five subscales that measure negative emotions. Previous studies have proved that POMS-SV can be used successfully to assess psychological distress in Romanian population (David et al., 2005; Marian, 2007). We performed a POMS-SV check on 20 childbearing women, and it showed a good internal consistency, with an Alpha Cronbach coefficient of .95.

Due to the institution restrictions related to Covid-19 (no free access between departments), the distribution of the questionnaires was carried out personally, by one of the authors and 3 other middle managers, midwives working in the postpartum department, previously trained by the author. An information form was attached to each questionnaire and the completion of the questionnaire required the informed consent. We asked mothers to concentrate only on the mentioned period. We did not collect information about their mental health status at the postpartum level. Two women with mental/cognitive or other disabilities who would have prevented them from understanding the nature and purpose of the study and/or providing the required information and five women whose newborns were in critical condition were excluded from the study. Also, due to the impossibility of obtaining the tutorial agreement in a pandemic context, twenty-nine minor mothers were excluded. Data processing was performed using the statistical program IBM SPSS 24.0 (IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov test indicated that the variables do not follow a normal distribution. A descriptive, frequency, correlation (Spear-

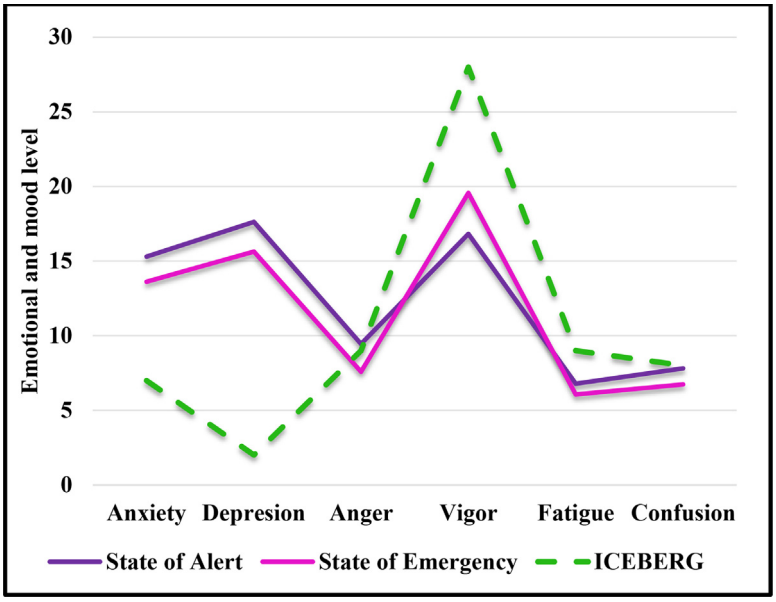

Fig. 1. Psychological Profile and Mood Disturbance.

man coefficient) and comparison (Mann-Whitney U and Kruskal Wallis tests) analysis was performed.

Results

The average age of the State of Emergency group was 25.39 (SD=5.96, min.18, max.41), and of the State of Alert group was 26.85 (SD=5.68, min.18, max 42). The profile of the two groups was almost similar in terms of demographic variables: almost the majority were ethnic Romanians, of Christian religion, more than three quarters came from rural areas and almost two thirds of them said they were unemployed, half of them had an average level of education and in terms of income per family almost half said they have an average income and a similar percent, minimum wage.

Half of the women from State of Emergency group stated that they kept in touch by phone with the physician who monitored their pregnancy and of these, up to 44 (35.5% of the total) received from them information about the virus, prevention measures, symptomatology, and evolution of the disease. Also, half of them declared that most of the information they had about the virus, the disease and the evolution of the pandemic came from television stations (TV) and the same source was mentioned by 40% of them for information on preventive measures.

Half of State of Alert group and almost three quarters of State of Emergency group stated that they monitored their pregnancy with an obstetrician, 40% of those belonging to the first group preferred state services and as many of the second group preferred private services.

One third of the women from State of Alert group declared that the main source of information regarding the Covid-19 virus and its effects was “family and friends”, for another third TV was the primary source, and for the rest, in equal percentages, specialists and the Internet. Also, well over a third of them declared that most of the information about prevention measures were obtained through TV shows and in only 11.7% of cases the information was obtained from physicians.

From the State of Alert group, 42 (47%) of women declared that they had 7-9 visits to the physician to monitor the pregnancy, 35 (29.2%) 4-6 visits, 29 (31.1%) 1-3 visits and 14 (11.7%) stated that they had not been to any antenatal medical consultation. Only 23.3% (N=28) of State of Alert group stated that the physicians who monitored their pregnancy also provided them with some information about the virus and the disease triggered by it and 16.7% (N=20) declared that they also received some information on measures to prevent contamination and infection with this virus.

Kruskal Wallis and U Mann-Whitney tests showed that between the two groups there are significant differences in terms of age group, so those from the State of Alert group tend to be of more mature ages (>25 years) H=4.726, $p<0.05$, and towards a higher parity (≥3 children) H=7.085, $p<0.05$ compared to those in the State of Emergency group. There are also significant differences in informing women about the Covid-19 virus, its effects and the measures needed to prevent contamination, so that if a third in the State of Emergency group benefited from information from specialists, most of the State of Alert group received information from unqualified sources H=11.767, p=0.001, H=12.288, $p<0.001$.

Highly significant differences were also identified in the communication and information of pregnant women from the physicians who monitored their pregnancy, the involvement of physicians who cared for women belonging to the State of Emergency group was higher than those responsible for monitoring women in the State of Alert group, both in terms of information about the Covid-19 virus and its pathogenic potential U=6092, $N1$=124, $N2$=120, $p<0.01$, and about the hygiene measures necessary to prevent disease U=6085, $N1$=124, $N2$=120, $p<0.01$.

The psychological and mood profile of the women surveyed (Fig. 1) compared to the Iceberg profile, considered the ideal profile, illustrates significant changes for Anxiety, Depression, and Vigor. The profiles of both groups showed an inverted graph for Anxiety and Depression and very low values for Vigor.

Out of the total number of women in the State of Emergency group, 45.2% (N=56) experienced Anxiety 16.9% (N=21) Depression, 51.6% (N=64) Anger, 33.9% (N=42) Fatigue and 40.3% (N=50) Confusion. Of the total women in the State of Alert group, 53.3% (N=64) experienced Anxiety, 18.3% (N=22) Depression, 56.7% (N=69) Anger, 41.7% (N=50) Fatigue, and 43.3% Confusion. Regarding distress, which represents the sum of the scores of negative affective dispositions, were identified in 25% (N=31) of the State of Emergency group and in 34.2% (N=41) from the State of Alert group.

Table 1
Demographic characteristics.

CATEGORY		STATE OF EMERGENCY N=124		STATE OF ALERT N=120	
		N	%	N	%
Age	18-24	70	56.5	50	41.7
	25-34	47	37.9	62	51.7
	35-41	7	5.6	8	6.7
Residence	Urban	33	26.6	35	29.2
	Rural	91	73.4	85	70.8
Ethnicity	Romanian	103	83.1	107	89.2
	Romma	21	16.9	13	10.8
Religion	Christian	117	94.4	115	95.8
	Other	7	5.6	5	4.2
Education level	None	11	8.9	8	6.7
	Low	34	27.4	39	32.5
	Medium	64	51.6	63	52.5
	High	15	12.1	10	8.3
Employed	Yes	38	30.6	49	40.8
	No	86	69.4	71	59.2
Income	Social Help	12	9.7	9	7.5
	Minim	53	42.7	50	41.7
	Medium	46	37.1	51	42.5
	>Medium	13	10.5	10	8.3
No. of children	1	65	52.4	44	36.6
	2	36	29.0	38	31.7
	≥3	23	18.6	38	31.7
Abortion/ miscarriage	0	80	64.5	67	55.8
	1	25	20.2	36	30.0
	≥2	19	15.3	17	14.2

Table 2
Data related to follow-up and information.

CATEGORY		STARE OF EMERGENCY		STATE OF ALERT	
		N	%	N	%
Follow-up	Nobody	12	9.7	16	13.3
	Family Physician	24	19.4	27	22.5
	Obstetrician	78	62.9	60	50.0
	Both	10	8.1	17	14.2
Where	State	53	42.7	35	29.2
	Privat	32	25.8	51	42.5
	Both	27	21.8	18	15.0
Information C19	Family/Friends	15	12.1	38	31.7
	Internet	15	12.1	20	16.7
	TV	63	50.8	39	32.5
	Physicians	28	22.6	20	16.7
	Other	3	2.4	3	2.5
Information measures	Family/Friends	19	15.3	32	26.7
	Internet	14	11.3	23	19.2
	TV	56	45.2	49	40.8
	Physicians	32	25.8	14	11.7
	Others	3	2.4	2	1.7

Regarding the TMD score (Total Mood Disturbance) only three women from each group exceeded the cut-off value with the amendment that the State of Alert group recorded scores close to this value in a much higher percentage (37.5 %) compared to State of Emergency group (25%).

Moreover, it was observed that the profile of women from State of Alert group was more altered than that of those from State of Emergency group, as demonstrated by the comparative analysis performed with the (*U*) Mann-Whitney test which identified significant differences between the two samples regarding to Anxiety U=6360, z=-1,962, p=0.05, Anger U=5891.5, z=-2,815, p<0.05, Vigor U=5641.5, z=-3,268, p=0.001, Distress U=6274.5, z=-2,115, p<0.05, TMD U=6169, z=-2,309, p<0.05. For the variables Depression, Fatigue and Confusion, a significance threshold p>0.05 was obtained, which proves that the test is insignificant.

The POMS is a valid instrument for measuring the women's emotions and moods in the 2 weeks before giving birth. As shown in Table 4, this study used Spearman's correlation analysis to test the correlations between the six subscales of the POMS. The results showed significant correlations among the subscales, which

Table 3
POMS-SV total mood disturbance (TMD), distress and subscales scores.

Subscales	**State of Emergency Group Mean (SD, min.-max.)**	**State of Alert Group Mean (SD, min.-max.)**
TMD	30.73 (32.2, -32-100) *	39.95 (27.0, -10-113) *
Distress	50.13 (28.9, 0-113) *	57.02 (23.4, 21-116) **
Anxiety	13.62 (7.5, 0-29) *	15.30 (6.2, 4-29) *
Depression	15.63 (11,2, 0-43) **	17.63 (9.2,5-42) **
Anger	7.58 (5.3, 0-19) *	9.44 (4.6, 3-31) **
Vigor	19.56 (7.0-34)	16.83 (5.5, 3-31)
Fatigue	6.06 (3.5, 0-14) *	6.78 (3.1, 1-14) **
Confusion	6.73 (4.6, 0-18) *	7.81 (3.7, 2-18) **

* p<.05.
** p<.001.

Table 4
Correlations among POMS factors scores.

Subscale	State of Emergency (n=124)					State of Alert (n=120)				
	1	2	3	4	5	1	2	3	4	5
1. Anxiety										
2. Depression	.781**					.777**				
3. Anger	.713**	.759**				.746**	.782**			
4. Vigor	-.355**	-.407**	-.296**			-.396**	-.536**	-.484**		
5. Fatigue	.690**	.624**	.657**	-.217*		.590**	.470**	.510**	-.129	
6. Confusion	.775**	.762**	.680**	-.397**	.691**	.643**	.694**	.684**	-.450**	.493**

* p <0.05.
** p<0.001.

indicated that the POMS had good content validity. No significant correlations were identified between emotional and sociodemographic parameters, but only a few weak correlations between emotional parameters and follow-up. Thus, in the State of Emergency group, it seems that Anxiety, Depression, Confusion, and Distress tended to increase among those who had had information from unreliable sources about prevention measures (r_s=-.234, p<0.01, r_s=-.240, p<0.01, r_s=-.250, p<0.01, respectively r_s=-.287, p=0.001). Also, the information received about Covid 19 tended to increase the degree of Confusion and Distress (r_s=-.205, p<0.05, r =-.219, p<0.05). In the State of Alert group, only the level of Depression was slightly enhanced by the information received on Covid 19.

Discussions

Although a normality, pregnancy is a time of increased psycho-emotional vulnerability, enhanced not only by the multiple adaptive morpho-functional transformations but also by the permanent uncertainties related to the safety and health of the child. During this stage of woman's life, emotional sensitivity reaches its peak, and any potential threat may cause anxiety (Nath et al., 2017). Scientifically and clinically, more attention has been paid to the psychological status of postpartum women and less to the psychological status of pregnant women, although it has been shown that the postnatal psychological disorders (depression, psychosis) may have correspondence in the antenatal period (Kinsella and Monk, 2009). It should also not be ignored that this stage overlaps with the neurological development of the future child and that there is a two-way mother-foetus connection both physically and psychologically (Kinsella and Monk, 2009; Tudose et al., 2017). The literature suggests that the foetus perceives the outside world through the feelings and experiences of the mother who carries it, so that her emotional disturbance will have the effect of emotional disturbance of the foetus with possible serious long-term effects (Iqbal et al., 2020, Goodman et al., 2014). Acute stress or the anxious state of the pregnant woman can negatively interfere with the neuropsychiatric development of the foetus, whose alteration may result in a future child with psycho-behavioral issues and reduced cognitive ability (Goodman et al., 2014, Pop-Tudose et al., 2019). Moreover, the maternal stress resulting from the pandemic extreme measures, especially the lockdown, could have a high mental response from the foetus, even affecting its brain development (Iqbal et al., 2020).

Previous research shows that the pandemic situations may affect people's emotional state and that misinformation or deficiencies of health systems in providing information and preparing the population to have appropriate attitudes may have a negative psychological impact (Cao et al., 2021).

Our findings are very similar to those of Tomfohr-Madsen et al. (2021), Sun et al. (2021), Fan et al. (2021), and indicate significantly elevated rates of antenatal anxiety during the COVID-19 pandemic, compared to historical norms. However, we found a higher prevalence of anxiety and a lower prevalence of depression compared to their results. Brik et al. (2021) have conducted research during lockdown and found a prevalence of pregnant women with anxiety symptoms of about 59% which was the closest to our results. By contrast, Zilver et al. (2021) found that COVID-19 had not increased anxiety and depression levels in Dutch pregnant women, maybe because in the Netherlands midwives are the main providers of prenatal care (Tikkanen et al., 2020; Wiegers, 2009).

Our study shows that access to private medical services increased during the alert-level state and the obstetrician was the most accessed specialist during both times, even though the antenatal care is provided by law through the family physicians' services. However, the sources of information declared by the women surveyed on the virus, symptoms of the disease and the prevention measures came only to a very small extent from specialists, while the main source declared was the TV, similar to findings of the Romanian study conducted by Cigăran et al. (2021).

In both groups, we identified psychological and mood changes, and high values of anxiety and depression and less vigor, respectively, with the specification that both the values and the percentage of women of the State of Alert group were slightly higher compared to those of the State of Emergency group.

A Canadian study showed that the effects of the Covid-19 increased anxiety and depression, especially among women of childbearing potential and the uncertainty about the transmission of the disease to the foetus or the increased risk of death among childbearing women has led to higher levels of stress and other negative emotions in pregnancy (Robinson et al., 2021).

In our study, we also found that the changes in emotional and mood parameters seemed to be related to the sources of information, but a larger analysis is needed to support this hypothesis. However, it is clear that the health services did not consider the psychological aspects associated with such a situation, nor did they manage to prepare an information and support strategy in this regard during the state of alert, by the time of this study (6 months after declaring the state of emergency). And even if half of State of Emergency group declared that during the state of emergency, they communicated by phone with the physician who monitored their pregnancy by then, they had not been the main source of information and, they had not provided enough knowledge to approach the pandemic safely.

The immuno-psycho-emotional vulnerability of pregnancy, in the context of the Covid-19 pandemic may increase, facilitating both the physical viral attack on the mother-foetus dyads as well as the psychological one (Cao et al., 2021; Zanardo et al., 2020). Health systems should find solutions to provide additional psycho-emotional support to pregnant women during pandemics or any other unusual situations related to unpredictable natural disasters (Ahmad and Vismara, 2021; Zanardo et al., 2020). Also, they should use antenatal screenings to identify psychological pathology, with

the provision of adapted cognitive therapies supported by specialists. In addition, the Romanian health system should reinstate the midwife into the community and facilitate women's access to their full scope of practice including their psycho-emotional support services (Radu et al., 2021).

Our study's limitations are mostly due to the pandemic situation. We had limited access and that restricted the number of potential subjects: only women in early postpartum, without access to pregnant women and minors. Because of the short time in terms of State of Emergency, we used the most accessible retrospective instrument to analyze the state of emotions and mood during the last 2 weeks of pregnancy of the women surveyed and we asked mothers to concentrate only on it. Moreover, we did not collect information about potential Covid-19 infections in their pregnancy, either theirs or of their partners or family members, that could have had an impact on their mental status. Also, the experience and feelings felt during and after the birth process and the women's postpartum mental health could have influenced their responses. Isolated, but possible, the responses related to the follow-up could have been biased, due to the unjustified fear that the physicians who monitored their pregnancy and were working in the hospital may see the questionnaires.

Conclusions

This study had showed a significant alteration of the psycho-emotional state of pregnant women against the background of the pandemic evolution, worsened by the radical measures of the State of Emergency and associated with the major deficiency of care services in supplying valid information and counseling for pregnant women's safety in the State of Alert.

The results highlighted the need to improve mental healthcare during pregnancy, especially in exceptional circumstances, such as the global pandemic situation or lockdown, as these can cause added stress and increased anxiety and depression symptoms, resulting in undesirable consequences for pregnancy and the future child. They also suggested the need to modernize health services and adapt them to the unique situations with the use of modern virtual techniques. In addition, the Romanian health care system should round off the team responsible for the care of mother and child with midwives, internationally recognized very skilled in informing, monitoring, counseling, and support in this field, and reinstate them into the community to ease the women's access to medical care and to more information and psycho-emotional support services. The health systems need to pay more attention to the psychological profile of pregnant women and should use screenings to identify pathological forms with the provision of adapted cognitive therapies supported by specialists.

Ethical approval

Prior to starting this study we obtained the approval from the chief of Obstetrics and Gynaecology Department of Buzau County Emergency Hospital, Buzau, Romania.

This study was approved by the Ethics Committee of Research "Carol Davila" University of Medicine and Pharmacy of Bucharest, Romania (no.11387/07.05.2021). It has unfolded under the aegis of anonymity. Every questionnaire was accompanied by an information sheet and filling in the questionnaire was considered a consent to participate. The Ethics Committee approved the consent procedures used.

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Declaration of Competing Interest

None Declared.

CRediT authorship contribution statement

Melania Elena Pop-Tudose: Conceptualization, Methodology, Investigation, Software, Writing – original draft, Writing – review & editing, Data curation, Validation. **Dana Maria Popescu-Spineni:** Methodology, Software, Data curation. **Loredana Sabina Cornelia Manolescu:** Methodology, Visualization, Validation. **Mihaela Corina Radu:** Data curation, Writing – review & editing. **Felicia Claudia Iancu:** Visualization, Writing – original draft. **Sebastian Mihai Armean:** Conceptualization, Supervision, Writing – review & editing, Validation.

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