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Original Article

Psychological Impact and Anxiety in Pregnant Women During the COVID-19 Pandemic in the Southeastern Region of Bangladesh

Md. Abdus Sattar[1], Fahmida Rashid[1], Farhana Akter[1], Rinku Das[2], Subrina Meher[1], Nargis Siddique[3], Shahnaj Sharmin[4], Mosammat Rashida Begum[5]

Abstract:

Introduction: *The COVID-19 Pandemic has had a profound effect on the psychology of people around the world. It posed fear and anxiety to all, and pregnant women became more vulnerable. Various factors and the scarcity of treatment and hospital facilities during the lockdown worsened the mental state. The study was performed to assess pregnant women's psychological impact and anxiety during the COVID-19 pandemic using a preset validated questionnaire.*

Methodology: *This cross-sectional study was conducted among 553 pregnant women, who visited for antenatal care in the outpatient department of Obstetrics and Gynecology, Chittagong Medical College Hospital, and private chambers of researchers from October to December 2020. The psychological impact of the COVID-19 pandemic on pregnant women was assessed by the Italian version of the Impact of Event Scale (IES-R) questionnaire. A score of >24 was taken as significant. A six-item short-form of the Spielberger State-Trait Anxiety Inventory (STAI-6) scale was used to measure anxiety, and a score >36 was considered significant. Data were analyzed with SPSS-22 using the Chi-square test (for categorical data) and t-test (for numerical data) as appropriate. The NOVA test was done to calculate the significance between the groups. The P values <0.5 were taken as significant.*

Results: *Among the participants(N-553), more than half (54%) of the participants had different grades (mild-27%, moderate-09%, and severe-18%) of psychological impact during the COVID-19 pandemic. The Mean (±SD) total IES-R score was 25.65(± 12.334) (range: 0-68); the STAI-6 score was above the cut-off value (i.e., > 36) [40.50 (± 15.027)] (range: 5-77). Severe IES-R scores were observed in women who attended private chambers than in government hospitals (p<0.001), and also in women among urban patients (p=0.001), middle-income group (p=0.001), and women who did not contact a doctor (p=0.001).*

Conclusion: *The study revealed that more than half of the pregnant women experienced psychological impact during pregnancy. A subset of them might be vulnerable to PTSD. Almost all of the pregnant women in the study developed anxiety during COVID-19. Identifying protective factors targeted to eliminate the psychological impact and anxiety of pregnant women is warranted.*

Key Word: *COVID-19, IES-R, PTSD, STAI-6*

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1. Chittagong Medical College
2. BGC Trust Medical College
3. Chattogram General Hospital
4. Chattogram Maa-O-Sishu Medical College;
5. Infertility Care and Research Centre

Corresponding author : Dr. Fahmida Rashid, Assistant Professor, Department of Obstetrics & Gynecology, Chittagong Medical College, Chittagong, Bangladesh. E-mail; dr.fahmidaswati @gmail.com

Introduction:

The COVID-19 pandemic is the most annihilating infectious disease in the recent history of humanity[1]. The scenario is the worst of all past horrific events in the world. The first COVID-19 was recognized in December 2019. After that, COVID-19 was spreading rapidly across the globe.

The COVID-19 pandemic touched everyone's life and affected them psychologically. Pregnancy is a state of change

in women's physiology and psychology. Pregnancy itself carries many psychological risks for pregnant women. Antenatal depression affects 10% of women in developed countries[2]. During this pandemic, pregnancy posed an additional set of worries. Depression and anxiety disorders were more common among pregnant women[3-5]. According to earlier research, infectious disease epidemics put pregnant women at higher risk for anxiety and depressive symptoms[6,7]. According to a study conducted in China, the rate of depression among pregnant women increased considerably after the COVID-19 outbreak was declared.[8] According to a 2020 cross-Canada survey, younger adult women reported feeling depressed at a rate of 24.3%, much higher than males at 18.9%.[9] According to a Canadian study, 37% of pregnant women reported clinically significant levels of depression, and 57% reported clinically significant levels of anxiety during the current COVID-19 pandemic[4]. According to a recent meta-analysis, 31% and 37% of pregnant women had anxiety and depression during the COVID-19 pandemic, respectively[10]. The survey by the Kaiser Family Foundation in late March 2020 said that 53% of women and 37% of men had coronavirus-related stress, which also negatively impacted mental health[11]. In a Chinese survey, about 58.8% of respondents suffered moderate to severe psychological impact, 28.8% reported mild to severe anxiety, and 17% suffered severe depression[12].

Isolation, social distancing, and extreme environmental change may increase the risk of depression among pregnant women during pandemics. Also, elevated antenatal psychological distress increases the risk of perinatal depression, prenatal infection, and illness rate[13]. Prenatal psychological distress changes physical activity, nutrition, and an individual's sleep, which affects maternal mood and fetal development.

Pregnant women also have concerns about delivery. Their ideas of how they wanted this to occur may be dramatically altered. Over a quarter of women report having a traumatic birthing experience and subsequent development of postpartum posttraumatic stress disorder[14]. Visitors are often restricted in many hospitals during labour and delivery. Birth assistants were prohibited in some hospitals. Also, the lack of a support system brought on by confinement at home and movement restrictions, uncertainty in prenatal care, and exposure risk for both mother and child raised the stress level of pregnant women[15]. Also, pregnant women with a history of mental illness were more susceptible than those without[16]. The COVID-19 pandemic may cause consultations to be rescheduled or canceled and medication to be stopped. Additionally, investigations have shown that psychopathological indications rise with daily deaths or verified COVID-19 cases[17].

So, increasing social support and adequate sleep are essential determinants of physical and psychological well-being, especially during pregnancy[18]. Encouraging positive health behaviour, increasing positive feelings, and enhancing emotion[19] indirectly decreases psychological stress during pregnancy[20]. Suspending isolation measures results in a reduction in anxiety and depressive symptoms[21].

For that, there is an urgent need to identify the prevalence of psychological distress among pregnant people during this pandemic, given the possible negative psychological consequences of psychological, physiological, and financial uncertainties mixed with social isolation[22].

The study aimed to see pregnant women's mental state (psychological impact & anxiety) during the COVID-19 pandemic.

Methodology:

This cross-sectional study was performed to assess the psychological status of pregnant women during the COVID-19 pandemic. Pregnant women who visited for antenatal care in the outpatient department of the Obstetrics and Gynecology (Ob-gyn), Chittagong Medical College Hospital, and private chambers of different obstetricians from October to December 2020, and, data collection started six months after the outbreak of COVID-19 in Bangladesh. Women with singleton pregnancies of all trimesters and who gave consent were included in this study. Women were approached for voluntary participation. Validated questionnaires were used to assess pregnant women's psychological impact and anxiety.

Psychological Impact Questionnaire: The Italian version of the revised Impact of Event Scale (IES-R) was used to assess the Psychological Impact of COVID-19. IES-R is a 22-item self-administered questionnaire composed of three subscales- avoidance, intrusion, and hyperarousal subscales. Each item scored 0-4(with labels of "Not at all" to "Extremely"). The scoring range is 0 to 88. A higher score represents a higher impact. The total score was categorized into mild (24-32), moderate (33-36), and severe (>37) impact[23,24]. A 'mild' score signifies that PTSD is a clinical concern for them. A 'moderate' score represents the best cut-off for a probable diagnosis of PTSD. A 'severe' score is enough to suppress one's immune system's functioning (even ten years after an impact event)[25].

Anxiety Questionnaire:

The six-item short-form of the Spielberger State-Trait Anxiety Inventory (STAI-6) state scale is one of the most frequently used measures of anxiety in applied psychological research[26-28], with a citation index over 160001 since its first publication[29]. It is a reliable[30] and sensitive measure of anxiety. The STAI-6 produces scores similar to those obtained using the full 20-item STAI. The total STAI score range is 20 – 80, with a higher score representing a high level of anxiety. Spielberger identified two anxiety-absent items as particularly sensitive to low stressors; all three anxiety-present items were reported to be exposed to high stressors[31]. A 'normal' score is approximately 34 – 36[32]. And a score >36 represents anxiety.

Data were analyzed with SPSS-22 using the chi-square test (for categorical data)/ t-test (for numerical data). ANOVA test was done to calculate the significance between the groups. IES-R scores were calculated across three subscales (avoidance, hyperarousal, intrusion), and both IES-R and STAI-6 scores were categorized into mild, moderate, and severe groups. The P values <0.5 were taken as significant.

Validation of Questionnaire:

The reliability and accuracy of this study's conclusions depend on questionnaire validation. The Psychological Impact Questionnaire used the Italian version of the IES-R, a well-validated tool for the psychological impact of traumatic events. This test is known for its strong psychometric qualities, which accurately classify psychological impact. The study also used the STAI-6, a reliable and sensitive anxiety measure used in applied psychological research. STAI-6 scores accurately measure anxiety. The study's validation of these questionnaires strengthens its data collection and analysis of pregnant women's psychological status during the COVID-19 pandemic.

Ethical Implication:

Following approval by the Ethical Review Committee of Chittagong Medical College &Hospital (Ref no-CMC/PG/2020/111), the study was carried out after obtaining Informed consent from all the participants.

Results:

To assess pregnant women's psychological impact and anxiety during the COVID-19 pandemic, around 553 women from the government and private hospitals responded to the questionnaire.

Table 1. Demographic Characteristics and univariate analysis of associated factors IES-R score category

Variables	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	P-value
Age (Years)					0.403
<20	18 (7.2)	13 (8.7)	4 (8.2)	3 (2.9)	
20-29	168 (67.2)	88 (59.1)	30 (61.2)	71 (69.6)	
30-39	64 (25.6)	48 (32.2)	15 (30.6)	28 (27.5)	
Type of Institute					<0.001*
Private	108 (55.7)	92 (92)	34 (97.1)	74 (96.1)	
Government	86 (44.3)	8 (8)	1 (2.9)	3 (3.9)	
Duration of Pregnancy					0.811
1st	61 (25.3)	41 (28.5)	14 (29.8)	20 (21.3)	
2nd	77 (32)	40 (27.8)	16 (34)	32 (34)	
3rd	103 (42.7)	63 (43.8)	17 (36.2)	42 (44.7)	
Residence					0.001*
Rural	97 (40.2)	85 (58.6)	16 (33.3)	45 (45.5)	
Urban	144 (59.8)	60 (41.4)	32 (66.7)	54 (54.5)	
Socio-economic Status					0.001*
Lower (<20K)	113 (49.3)	44 (32.1)	17 (36.2)	25 (26.3)	
Middle (20-40K)	87 (38)	75 (54.7)	25 (53.2)	51 (53.7)	
High (>40K)	29 (12.7)	18 (13.1)	5 (10.6)	19 (20)	

Table 1. Demographic Characteristics and univariate analysis of associated factors IES-R score category (Cont'd)

Variables	Normal n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	P-value
H/O COVID-19 (self/family)			0.058		
Yes	16 (6.5)	14 (9.7)	4 (8.2)	16 (15.8)	
No	229 (93.5)	130 (90.3)	45 (91.8)	85 (84.2)	
Physician consultation during COVID-19					0.001*
Yes	180 (72.9)	124 (27.1)	42 (85.7)	92 (90.2)	
No	67 (27.1)	24 (72.9)	7 (14.3)	10 (9.8)	
Type of consultation					0.036*
Direct	151 (79.9)	107 (81.1)	29 (65.9)	63 (66.3)	
Virtual	30 (15.9)	17 (12.9)	9 (20.5)	24 (25.3)	
Via others	8 (4.2)	8 (6.1)	6 (13.6)	8 (8.4)	
Satisfaction about consultation					0.011*
Yes	181 (91.4)	124 (90.5)	34 (77.3)	77 (81.9)	
No	17 (8.6)	13 (9.5)	10 (22.7)	17 (18.1)	
Sleeping hour/day					<0.001s
<7	78 (31.3)	25 (16.8)	2 (4)	21 (20.6)	
≥7	171 (68.7)	124 (83.2)	48 (96)	81 (79.4)	
Financial status in the last six months			0.04s		
Same	134 (54.5)	100 (68.5)	32 (65.3)	64 (62.7)	
Deteriorated	112 (45.5)	46 (31.5)	17 (34.7)	38 (37.3)	

P-value derived from Chi-square test; * = statistically significant.

Table 1 presents the demographic characteristics and univariate analysis of associated factors influencing the IES-R (Impact of Event Scale-Revised) score categories among a sample population. It categorizes the participants into four IES-R score groups: Normal, Mild, Moderate, and Severe. The variables analyzed include age, type of institute (private or government), duration of pregnancy, residence (rural or urban), socio-economic status (income per month), history of COVID-19 (self or family members), physician consultation during the COVID-19 pandemic, type of consultation (direct, virtual, or via others), satisfaction with consultation, sleeping hours per day, and financial status in the last six months. Statistically significant associations ($p < 0.05$) were observed with the type of institute, residence, socioeconomic status, physician consultation, type of consultation, satisfaction with consultation, sleeping hours per day, and financial status. No significant associations were found with age, duration of pregnancy, or history of COVID-19.

Table 2. Stress scoring of the pregnant women

Variables	Mean ± SD	Range
IES-R Score Total (Significant value >24)	25.65 ± 12.344	0-68
STAI-6 Score (Significant value > 36)	40.50 ± 15.027	5-77
Avoidance-Item Score	5.49 ± 3.517	0-16
Hyperarousal-Item Score	15.52 ± 7.925	0-54
Intrusion-Item Score	4.67 ± 3.605	0-16

Data are expressed as Mean ± SD (range)

Table 2 shows the mean ± SD stress scorings of pregnant women. The mean ±SD total IES-R score was 25.65 ± 12.334 (range: 0-68), STAI-6 score was 40.50 ± 15.027 (range: 5-77), Avoidance-item score was 5.49 ± 3.517 (range: 0-16), Hyperarousal-item score was 15.52 ± 7.925 (range: 0-54), Intrusion-item score was 4.67 ± 3.605 (range: 0-16).

Table 3. IES-R and STAI-6 Scores across Subscales and Categories

Variables	Normal	Mild	Moderate	Severe	P-value
STAI-6 Score	36.3±15.2	43.8±13.42	44.6±12.55	44±15.42	0.001[s]
Avoidance-Item Score	3.51±2.49	6.01±2.86	7.10±3.22	8.80±3.54	<0.001[s]
Hyperarousal-Item Score	9.28±3.98	16.66±3.54	20.7±3.92	26.59±6.47	<0.001[s]
Intrusion-Item Score	2.24±2.32	5.21±2.60	6.38±2.73	9.02±2.89	0.174[ns]

P value was derived from the ANOVA test; s= statistically significant; ns= non-significant

Table 3 shows a significant difference in the mean STAI-6 score, avoidance-item score, and hyperarousal-item score. No significant difference was found in the mean intrusion item and COVID-related scores.

The pie chart revealed that 46% of patients had an average psychological impact, 27% had mild, 9% had moderate, and 18% had a severe psychological impact during the COVID-19 pandemic (figure 1).

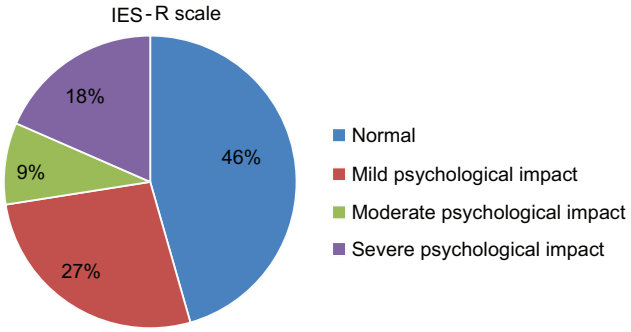

Figure 1. Distribution of categories of IES-R

Table 4. Previous History and lifestyle of pregnant women

Variables	Level	Frequency (percentage)
H/O Post-Partum depression	Yes	44 (8.2)
/Psychiatric disorder	No	492 (91.8)
Physical Activity/	Yes	420 (77.6)
Habit of Exercise	No	121 (22.4)
Food intake during COVID	Normal	368 (72.9)
	Increased	23 (4.6)
	Decreased	114 (22.6)
Behaviour with family members	Inappropriate	69 (13.6)
	Normal	309 (60.7)
	Good	131 (25.7)
H/O Diabetes Mellitus	Yes	43 (8.3)
	No	476(91.7)
H/O Hypertension	Yes	35 (8.7)
	No	484 (93.3)
H/O Thyroid disorder	Yes	3 (0.6)
	No	516 (99.4)
H/O Asthma	Yes	10 (1.9)
	No	509 (98.1)
H/O Infertility	Yes	9 (1.7)
	No	510 (98.3)

Data are expressed as frequency (percentage)

Table 4 shows that only 8.2% of patients had a history of postpartum depression/psychiatric disorder. About 77.6% of women had a history of regular physical activity/exercise. In the last six months, financial status was the same among 60.8% of patients. Normal behaviour was found in 60.7% of patients with family members, whereas 13.6% showed inappropriate behaviour.

The table shows that only 8.3% of patients had a history of DM, 8.7% of patients had a history of HTN, 0.6% of patients had a history of thyroid disorder, 1.9% of patients had a history of asthma, and 1.7% patients had a history of infertility.

Discussion:

The study assessed pregnant women's psychological impact and anxiety during the COVID-19 pandemic.

Among the participants, more than two-thirds were in the younger age group, mostly from middle and lower-income families, two-thirds of women were recruited from private chambers, and more than half were from an urban area. About half of the participants had attained less than a higher secondary level, including a few illiterates, and the remaining had education levels above them. There was no significant difference in different age groups, duration of pregnancy, and History of COVID-19 positive (self/family member) between the IES-R score category. A significantly higher frequency of severe IES-R scores was observed in patients

in the private chamber than in government hospitals, among urban, middle-income groups, and patients who did not contact the doctor. In studies, the most impacted groups were women and young people, similar to ours[11,33].

The current study revealed that pregnant women experienced a clinically significant psychological impact (mild, moderate, and severe) based on IES-R scores. An average score signifies a 'probable' diagnosis of PTSD and a higher score for a 'high' risk of PTSD (enough to suppress one's immune system even a decade after the impact event). Nearly one in five (18%) participants experienced a severe psychological impact, meaning they had a high risk of developing PTSD in later life. Among the three subscales of IES-R scores, hyperarousal (anger, irritability, hypervigilance, difficulty concentrating, and heightened startle) contributed to the highest. Avoidance subscale scores were also found to be statistically significant in this study. Zhou et al. observed that one in 10 pregnant women in China had clinically significant PTSD symptoms[34]. Liu et al. (USA) discovered clinical-level PTSD symptoms in women during perinatal (antenatal and postpartum) periods [35]. Berthelot et al. (Canada) discovered that pregnant women experiencing the pandemic had increased PTSD symptoms [36]. Studies in many countries indicate that pregnant women develop PTSD symptoms during the COVID-19 pandemic, despite varying diagnostic methodologies. Our study indicates that the pandemic leads to PTSD symptoms in pregnant women.

All the pregnant women reported clinically and statistically significant increased anxiety levels revealed by STAI-6 score (the mean score was above the cut-off). Similarly, a study found that the COVID-19 outbreak affected pregnant women psychologically in a moderate to severe way. Additionally, more than two-thirds of the women indicated higher-than-average anxiety [37]. In a study, more than half of the respondents reported having moderate to severe psychological problems (anxiety, depression, and stress)[38]. Numerous studies have noted an increase in the signs and symptoms of depression and anxiety[3,39,40], a decline in mental health [41], and an increase in the perceived severity of distress[42]. Due to the increased risk of financial and socio-environmental issues, stress scenarios brought on by the pandemic context may exacerbate pre-existing conditions of susceptibility, particularly in low- and middle-income countries[43].

Phycological impact and anxiety did not significantly affect pregnant women's lifestyle, postpartum depression/ psychiatric disorder history, or physical activity/exercise in the present study. A history of sleeping <7 hours/day and financial position worsening significantly impacted psychological impact and anxiety. The present investigation found no significant psychological impact or anxiety from comorbidities. Given the peculiarities of the COVID-19 pandemic, the lack of comparable baseline conditions, and the abruptness of the societal upheavals that have affected psychology and anxiety levels, the responsibility of having children may increase. Pregnant women may also experience anxiety due to the above-listed circumstances. This is particularly valid when one's income and working hours have been negatively impacted. For example, it is often recognized that pregnant women experience high levels of stress and anxiety due to their frequent concerns about losing their jobs[44].

Conclusion:

The study found that pregnant women's psychological stress and anxiety during the COVID-19 pandemic were substantial. Nearly half of the subjects suffered psychological distress. IES-R scores were substantially correlated with healthcare facility, residence, socioeconomic status, physician consultation, type and satisfaction of consultation, sleeping hours, and financial situation. Psychological status during pregnancy might reach a level that a portion of women become susceptible to PTSD. The findings highlight the need for targeted mental health support for pregnant women, especially those in vulnerable socio-economic conditions or without adequate access to healthcare services. This underscores the importance of comprehensive prenatal care that includes mental health assessments and interventions.

Limitation of the Study:

It was a cross-sectional design making it difficult to link psychological impact with the COVID-19 epidemic in pregnant women. Self-reported data may be biased and inaccurate. While verified, the Italian IES-R and STAI-6 surveys may not adequately depict Bangladeshi culture. The sample was also taken from a single medical college hospital and private chambers in Chittagong, which may not reflect all pregnant women in Bangladesh. Finally, previous mental health history and social support systems were not considered confounding variables.

References:

1. Worldometer. COVID - Coronavirus Statistics. Accessed February 28, 2023. Available at: https://www.worldometers.info/coronavirus/

2. Noordam R, Aarts N, Verhamme KM, Sturkenboom MCM, Stricker BH, Visser LE. Prescription and indication trends of antidepressant drugs in the Netherlands between 1996 and 2012: a dynamic population-based study. Eur J Clin Pharmacol. 2015;71(3):369–375.

3. Duranku[o] F, Aksu E. Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: A preliminary study. J Matern Fetal Neonatal Med. 2020;5(1):1–7.
4. Lebel C, MacKinnon A, Bagshawe M, Tomfohr-Madsen L, Giesbrecht G. Elevated depression and anxiety symptoms among pregnant individuals during the COVID-19 pandemic. J Affect Disord. 2020;277:5–13. doi:10.1016/j.jad.2020.07.126
5. Liu CH, Erdei C, Mittal L. Risk factors for depression, anxiety, and PTSD symptoms in perinatal women during the COVID-19 pandemic. Psychiatry Res. 2020;295:113552. doi:10.1016/j.psychres.2020.113552
6. Lee DT, Sahota D, Leung TN, Yip AS, Lee FF, Chung TK. Psychological responses of pregnant women to an infectious outbreak: a case-control study of the 2003 SARS outbreak in Hong Kong. J Psychosom Res. 2006;61(5):707–713. doi:10.1016/j.jpsychores.2006.08.005
7. Filgueiras Meireles JF, Neves CM, Morgado F, Caputo Ferreira ME. Zika virus and pregnant women: a psychological approach. Psychol Health. 2017;32(7):798–809. doi:10.1080/08870446.2017.1307369
8. Wu Y, Zhang C, Liu H, Duan C, Li C, Fan J, et al. Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China. Am J Obstet Gynecol. 2020;223(2):240.e1–240.e9. doi:10.1016/j.ajog.2020.05.009
9. Centre for Addiction and Mental Health (CAMH). Anxiety patterns in Canadians mirror the progression of a pandemic. Accessed January 9, 2021. Available at: https://www.camh.ca/en/health-info/mental-health-and-COVID-19/COVID-19-national-survey
10. Yan H, Ding Y, Guo W. Mental health of pregnant and postpartum women during the coronavirus disease 2019 pandemic: a systematic review and meta-analysis. Front Psychol. 2020;11:617001. doi:10.3389/fpsyg.2020.617001
11. Hamel L, Salganicoff A. Is there a widening gender gap in coronavirus stress? April 6, 2020. www.KFF.org
12. Wang C, Pan R, Wan X, et al. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health. 2020;17(5):1729. doi:10.3390/ijerph17051729
13. Coussons-Read ME. Effects of prenatal stress on pregnancy and human development: mechanisms and pathways. Obstet Med. 2013;6(2):52–57.
14. Olde C, van der Hart O, Kleber R, van Son M. Posttraumatic stress following childbirth: A review. Clin Psychol Rev. 2006;26(1):1–16.
15. Farewell CV, Jewell J, Walls J, Leiferman JA. A mixed-methods pilot study of perinatal risk and resilience during COVID-19. J Prim Care Community Health. 2020;11:2150132720944074. doi:10.1177/2150132720944074
16. Jones I, Chandra PS, Dazzan P, Howard LM. Bipolar disorder, affective psychosis, and schizophrenia in pregnancy and the postpartum period. Lancet. 2014;384(9956):1789–1799. doi:10.1016/S0140-6736(14)61278-2
17. Zhou Y, Shi H, Liu Z, Peng S, Wang R, Qi L, et al. The prevalence of psychiatric symptoms of pregnant and non-pregnant women during the COVID-19 epidemic. Transl Psychiatry. 2020;10(1):1–7. doi:10.1038/s41398-020-01006-x
18. Dunkel Schetter C. Psychological science on pregnancy: stress processes, biopsychosocial models, and emerging research issues. Annu Rev Psychol. 2011;62:531–555.
19. Cohen S, Wills TA. Stress, social support, and the buffering hypothesis. Psychol Bull. 1985;98(2):310–357.
20. Giesbrecht GF, Poole JC, Letourneau N, Campbell T, Kaplan BJ; the APrON Study Team. The buffering effect of social support on hypothalamic-pituitary-adrenal axis function during pregnancy. Psychosom Med. 2013;75(9):856–862.
21. Kotabagi P, Fortune L, Essien S, Nauta M, Yoong W. Anxiety and depression levels among pregnant women with COVID-19. Acta Obstet Gynecol Scand. 2020;99(7):953–954.
22. Reid KM, Taylor MG. Social support, stress, and maternal postpartum depression: A comparison of supportive relationships. Soc Sci Res. 2015;54:246–262.
23. Weiss DS, Marmar CR. The Impact of Event Scale—Revised. In: Wilson JP, Keane TM, editors. Assessing Psychological Trauma and PTSD. The Guilford Press; 1997. p. 399–411.
24. Pietrantonio F, De Gennaro L, Di Paolo MC, Solano L. The Impact of Event Scale: validation of an Italian version. J Psychosom Res. 2003;55(4):389–393.
25. Creamer M, Bell R, Failla S. Psychometric properties of the Impact of Event Scale-Revised. Behav Res Ther. 2003;41(12):1489–1496.
26. Littleton HL, Breitkopf CR, Berenson AB. Correlates of anxiety symptoms during pregnancy and association with perinatal outcomes: a meta-analysis. Am J Obstet Gynecol. 2007;196(5):424–432.
27. Manzoni GM, Pagnini F, Castelnuovo G, Molinari E. Relaxation training for anxiety: a ten-year systematic review with meta-analysis. BMC Psychiatry. 2008;8(1):41. doi:10.1186/1471-244X-8-41
28. Panteleeva Y, Ceschi G, Glowinski D, Courvoisier DS, Grandjean D. Music for anxiety? Meta-analysis of anxiety

reduction in non-clinical samples. Psychol Music. 2018;46(4):473–487. doi:10.1177/0305735617712424

29. Spielberger CD, Gorsuch RL, Lushene RE. Manual for the State-Trait Anxiety Inventory. Retrieved from: https://ubir.buffalo.edu/xmlui/handle/10477/2895

30. Barnes LL, Harp D, Jung WS. Reliability generalization of scores on the Spielberger State-Trait Anxiety Inventory. Educ Psychol Meas. 2002;62(4):603–618. doi:10.1177/0013164402062004005

31. Spielberger CD. Manual for the State-Trait Anxiety Inventory (STAI Form Y). Consulting Psychologists; 1983. Available at: https://doi.org/10.1002/9780470479216.corpsy0943

32. Bekker HL, Legare F, Stacey D, O'Connor A, Lemyre L. Is anxiety an appropriate measure of decision aid effectiveness: a systematic review? Patient Educ Couns. 2003;50(3):255–262.

33. Porta-Casteràs D, Fullana MA, Tinoco D, Martínez-Zalacaín I, Pujol J, Palao DJ, et al. Prefrontal-amygdala connectivity in trait anxiety and generalized anxiety disorder: Testing the boundaries between healthy and pathological worries. J Affect Disord. 2020;267:211–219.

34. Zhou Y, Liu Z, Peng S, Wang R, Qi L, et al. The prevalence of psychiatric symptoms of pregnant and non-pregnant women during the COVID-19 epidemic. Transl Psychiatry. 2020;10(1):1–7. doi:10.1038/s41398-020-01006-x

35. Liu CH, Erdei C, Mittal L. Risk factors for depression, anxiety, and PTSD symptoms in perinatal women during the COVID-19 pandemic. Psychiatry Res. 2021;295:113552. doi:10.1016/j.psychres.2020.113552.

36. Berthelot N, Lemieux R, Garon-Bissonnette J, Drouin-Maziade C, Martel É, Maziade M. Uptrend in distress and psychiatric symptomatology in pregnant women during the coronavirus disease 2019 pandemic. Acta Obstet Gynecol Scand. 2020;99(7):848–855. doi:10.1111/aogs.13925.

37. Saccone G, Florio A, Aiello F, Venturella R, De Angelis MC, Locci M, Bifulco G, Zullo F, Di Spiezio Sardo A. Psychological impact of coronavirus disease 2019 in pregnant women. Am J Obstet Gynecol. 2020;223(2):293–295. doi:10.1016/j.ajog.2020.05.003.

38. Wang W, Xu Y, Gao R, et al. Detection of SARS-CoV-2 in different types of clinical specimens. JAMA. 2020;323(18):1843–1844. doi:10.1001/jama.2020.3786.

39. Sun N, Wei L, Shi S, Jiao D, Song R, Ma L, Wang H, Wang C, Wang Z, You Y, Liu S, Wang H. A qualitative study on the psychological experience of caregivers of COVID-19 patients. Am J Infect Control. 2020;48(6):592–598. doi:10.1016/j.ajic.2020.03.018.

40. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, Tong S. Epidemiology of COVID-19 among children in China. Pediatrics. 2020;145(6). doi:10.1542/peds.2020-0702.

41. Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The Fear of COVID-19 Scale: Development and initial validation. Int J Ment Health Addict. 2022;20(3):1537–1545. doi:10.1007/s11469-020-00330-z.

42. Berthelot N, Lemieux R, Garon-Bissonnette J, Drouin-Maziade C, Martel É, Maziade M. The uptrend in distress and psychiatric symptomatology in pregnant women during the coronavirus disease 2019 pandemic. Acta Obstet Gynecol Scand. 2020;99(7):848–855. doi:10.1111/aogs.13925.

43. Gelaye E, Achenbach JE, Jenberie S, et al. Molecular characterization of orf virus from sheep and goats in Ethiopia, 2008-2013. Virol J. 2016;13:34. doi:10.1186/s12985-016-0489-3.

44. Dong H, Hu R, Lu C, Huang D, Cui D, Huang G, Zhang M. Investigation on the mental health status of pregnant women in China during the COVID-19 pandemic. Arch Gynecol Obstet. 2021;303(2):463–469. doi:10.1007/s00404-020-05805-x.