

was performed by RG, NM and DM. NM and RG contributed to statistical analysis. BG, NM and SM provided administrative and technical or material support. All authors contributed to the analysis and interpretation of the data, and reviewed and approved of the final version of the manuscript.

## CONFLICTS OF INTEREST

The authors have no conflicts of interest.

## REFERENCES

1. Gutman JR, Lucchi NW, Cantey PT, et al. Malaria and parasitic neglected tropical diseases: Potential syndemics with COVID-19? *Am J Trop Med Hyg.* 2020;103:572–577.

2. Lorenz C, Azevedo TS, Chiaravalloti-Neto F. COVID-19 and dengue fever: A dangerous combination for the health system in Brazil. *Travel Med Infect Dis.* 2020;35:101659.
3. Mahajan NN, Pednekar R, Patil SR, et al. Preparedness, administrative challenges for establishing obstetric services, and experience of delivering over 400 women at a tertiary care COVID-19 hospital in India. *Int J Gynecol Obstet.* 2020;151:188–196.

## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

**File S1.** TNMC ethical approval.

**File S2.** NIRRH ethical approval.

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## Obstetrics

# Evaluation of psychological impact, depression, and anxiety among pregnant women during the COVID-19 pandemic in Lahore, Pakistan

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The substantial burden of the COVID-19 pandemic has led to increased feelings of fear and uncertainty. The contagious nature and high mortality associated with the disease has caused psychological distress, depression, stress, and anxiety among the general population, including pregnant women.<sup>1,2</sup> The COVID-19 pandemic affects pregnant women's perceptions, appetite, psychosocial behavior, and sleep patterns, which in turn may impact the physical and cognitive development of their newborn babies.<sup>3</sup> This has resulted in myriad issues for overburdened health systems trying to provide appropriate medical and mental health care.<sup>4–6</sup> Pakistan, a low-income country, has been

slow to recognize maternal health conditions; therefore, these are unrecognized and undertreated.<sup>7,8</sup> The present study highlights socio-demographic factors, psychological impact, levels of depression (no depression, possible depression, and maximum depression) and anxiety, lack of appetite, and sleep disturbances among pregnant women in Lahore, Pakistan, during the COVID-19 pandemic.

A descriptive cross-sectional study on pregnant women visiting the Outpatient Department (OPD) of Obstetrics and Gynecology, Sheikh Zayed Hospital, Lahore, was conducted from August 6–20, 2020; a consecutive sampling technique (non-probability) was used.

**TABLE 1** Perceptions of pregnant women toward the COVID-19 pandemic (n=552).

Perceptions of pregnant women toward the COVID-19 pandemic (n=552)	Yes (%)	No (%)
Are you more vulnerable to contracting COVID-19 than the general population?	469 (85%)	83 (15%)
Is vertical transmission of COVID-19 to your fetus possible?	351 (64%)	201 (36%)
Can you contract COVID-19 whilst visiting the hospital for your checkup?	489 (89%)	63 (11%)
Do you think elective cesarean section is a better option for delivery than vaginal delivery during the COVID-19 pandemic?	104 (19%)	448 (81%)
Mean	353 (64%)	199 (36%)

Pregnant women were included irrespective of their gestational period and parity, whereas pregnant women with psychiatric disorders and co-morbidities were excluded from the study. A total of 600 pregnant women were selected for this study. Among the study group, 552 (92%) responded and were included for further analysis.

Psychological impact due to the COVID-19 pandemic was measured using the Kessler-10 scale (K-10),<sup>9</sup> and depression and anxiety were measured using the Edinburgh Postnatal Depression Scale (EPDS).<sup>10</sup> Research data were evaluated using SPSS version 22.0 (IBM, Armonk, New York, USA).

**TABLE 2** Factors associated with perceptions of pregnant women toward the COVID-19 pandemic (n=552).

Respondent's factors associated with perceptions toward the COVID-19 pandemic (N=552)					
Factors	Frequency (n=552) (%)	Perceptions of pregnant women toward the COVID-19 pandemic (N=552)		Odds ratio 95% CI <sup>a</sup>	P value
		Yes n=353 (64%)	No n=199 (36%)		
<b>Socio-demographic factors</b>					
Age of Women (years)	Mean ± Standard Deviation		32 ± 7.3		
<25	123 (22%)	39 (11%)	84 (42%)	reference	0.01*
25-35	173 (31%)	113 (32%)	60 (30%)	1.60 (1.22-2.29)	
>35	256 (47%)	201 (57%)	55 (28%)	1.97 (1.76-2.50)	
<b>Education</b>					
Illiterate	87 (15%)	7 (2%)	80 (40%)	reference	0.001*
Primary	158 (29%)	99 (28%)	59 (30%)	1.73 (1.42-2.33)	
Secondary & higher secondary	165 (30%)	109 (31%)	56 (28%)	2.24 (1.88-2.77)	
Graduate & post-graduate	142 (26%)	138 (39%)	4 (2%)	2.45 (2.13- 3.01)	
<b>Occupation</b>					
Housewife	206 (37%)	95 (27%)	111 (56%)	reference	
Private sector	160 (29%)	106 (30%)	54 (27%)	1.51 (1.10-1.96)	0.000*
Public sector	186 (34%)	152 (43%)	34 (17%)	1.89 (1.31-2.32)	
<b>Monthly household income</b>					
<25 000	134 (24%)	11 (3%)	123 (62%)	reference	
25 000-50 000	114 (21%)	74 (21%)	40 (20%)	1.24 (1.04-1.49)	
51 000-75 000	111 (20%)	81 (23%)	30 (15%)	1.87 (1.57-2.22)	0.03*
>75 000	193 (35%)	187 (53%)	6 (3%)	3.04 (2.48-3.70)	
<b>Week of gestation</b>					
	Mean ± Standard Deviation	25.3 ± 10.4			
1st trimester (1-13 weeks)	204 (37%)	67 (19%)	137 (69%)	reference	0.04*
2nd trimester (14-26 weeks)	162 (29%)	116 (33%)	46 (23%)	1.56 (1.28-1.67)	
3rd trimester (27-40 weeks)	186 (34%)	170 (48%)	16 (8%)	2.03 (1.62-2.47)	
<b>No. of children</b>					
	Mean ± Standard Deviation	1.96 ± 1.04			
0	148 (27%)	7 (2%)	141 (71%)	reference	

(Continues)

TABLE 2 (Continued)

Respondent's factors associated with perceptions toward the COVID-19 pandemic (N=552)					
Factors	Frequency (n=552) (%)	Perceptions of pregnant women toward the COVID-19 pandemic (N=552)		Odds ratio 95% CI <sup>a</sup>	P value
		Yes n=353 (64%)	No n=199 (36%)		
1	170 (31%)	138 (39%)	32 (16%)	0.71 (0.55- 1.49)	0.34
2 or more	234 (42%)	208 (59%)	26 (13%)	1.11 (0.73- 1.56)	
Psychological impact					
Do you think that the COVID-19 pandemic has affected your mental health?					
Yes	199 (36%)	190 (54%)	9 (5%)	2.61 (1.86-3.31)	0.002*
No	353 (64%)	163 (46%)	190 (95%)	reference	
Level of disorder					
Likely to be well	353 (64%)	165 (47%)	188 (94%)	reference	
Mild disorder	151 (27.3%)	142 (40%)	9 (4%)	2.64 (2.39 -3.15)	0.003*
Moderate disorder	40 (7.2%)	39 (11%)	1 (1%)	2.43 (1.84 -2.57)	
Severe disorder	8 (1.5%)	7 (2%)	1 (1%)	1.61 (1.47 -2.38)	
Depression and anxiety					
Do you think the COVID-19 pandemic has made you depressed or anxious?					
Yes	215 (39%)	199 (56.4%)	16 (8%)	2.87 (2.38-3.64)	
No	337 (61%)	154 (43.6%)	183 (92%)	reference	0.01*
Level of depression					
Likely to be well	337 (61%)	159 (45%)	178 (89.5%)	reference	
Possible depression	182 (33%)	164 (46.5%)	18 (9%)	2.83 (2.25-3.57)	0.02*
Maximum depression	33 (6%)	30 (8.5%)	3 (1.5%)	1.70 (1.34-2.13)	
Lack of appetite and sleep disturbances					
Do you have a lack of appetite during the current pandemic?					
Yes	182 (33%)	180 (51%)	2 (1%)	0.99 (0.36-1.34)	
No	370 (67%)	173 (49%)	197 (99%)	reference	0.28
Do you have sleep disturbance during the current pandemic?					
Yes	186 (34%)	184 (52%)	2 (1%)	2.29 (1.72-2.99)	
No	366 (66%)	169 (48%)	197 (99%)	reference	0.01*

Reference category=1.

<sup>a</sup>CI (Confidence Interval).

\*Statistically significant.

Before commencement of the study, ethical approval was obtained from the relevant supervisor and Institutional Review Board of Shaikh Zayed Medical Complex, Lahore, Pakistan. Informed oral and written consent were obtained from all participants.

Of the 552 participants, 353 (64%) respondents displayed high levels of awareness of, and concerns about, the COVID-19 pandemic (i.e. fears of carrying the virus, vertical transmission causing harm to fetuses, vulnerability), whereas 199 (36%) respondents showed lower levels of concern (Table 1). Table 2 shows socio-demographic factors, psychological impact, depression and anxiety, lack of appetite, and sleep disturbances of pregnant women during the COVID-19 pandemic, tabulated through frequency, percentage, mean and standard

deviation, cross-tabulation, and binary logistic regression (odds ratio and 95% confidence interval).

The K-10 scale measures the psychological impact of the COVID-19 pandemic on respondents (Table 2). The available answers for respondents were: none, a little, some, most, and all of the time. These answers were dichotomized into yes=1 (a little, some, most, and all of the time) and no=0 (none of the time). Thus, of the 552 participants in this study, 353 (64%) respondents experienced no effect on their mental health, had K-10 scale scores lower than 20, and were likely to be well, whereas 199 (36%) pregnant women stated that the COVID-19 pandemic had a large impact on their mental health. A total of 151 (27.3%) pregnant women displayed mild signs of psychological

impact, with K-10 scale scores between 20 and 24. Forty respondents (7.2%) had moderate signs of psychological impact, with K-10 scale scores between 25 and 29, and eight (1.5%) respondents had severe signs of psychological impact, with K-10 scale scores of 30 or higher.

Concerning the prevalence of depression and anxiety among the 552 respondents (Table 2), 337 (61%) pregnant women neither felt depressed nor anxious, had EPDS scores below 10, and were likely to be well. A total of 215 (39%) pregnant women stated that the COVID-19 pandemic had caused them depression and anxiety, while 182 (33%) respondents were found to have possible depression, with EPDS scores of 10 or greater; 33 (6%) respondents scored 30 on the EPDS, indicating maximum depression.

The present study reveals pregnancy to be a determinant factor for negative perceptions of the COVID-19 pandemic (e.g. being exposed, more vulnerable, and fearing vertical transmission or harm to the pregnant woman). The study also found associations between socio-demographic factors (i.e. age, education, occupation, monthly income) and weeks of gestation, psychological impact, depression, anxiety, and sleep disturbances. Thus, despite the wealth of knowledge regarding the disease, the perceptions of pregnant women, social stigma, and discrimination from society have led to many challenges in dealing with the mental health of pregnant populations during the COVID-19 pandemic. Educational programs should be designed to address pregnant women's perceptions of the COVID-19 pandemic in order to improve their mental wellbeing.

#### AUTHOR CONTRIBUTIONS

AS contributed to the conception and design of the study, data collection, and writing of the manuscript. AJ contributed to the design of the study. SR contributed to data acquisition. RT contributed to analysis and interpretation of data. MI contributed to interpretation of the data and writing of the manuscript. MS finalized and revised the manuscript. All authors approved of the final version of the manuscript.

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#### CONFLICTS OF INTEREST

The authors have no conflicts of interest.

#### REFERENCES

1. Durankuş 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;15:1–7.
2. Wu Y, Zhang C, Liu H, 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.
3. Thapa SB, Mainali A, Schwank SE, Acharya G. Maternal mental health in the time of the COVID-19 pandemic. *Acta Obstet Gynecol Scand.* 2020;99:817–818.
4. Xiang YT, Yang Y, Li W, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry.* 2020;7:228–229.
5. 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;17:1729.
6. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet.* 2020;395:497–506.
7. Gelaye B, Rondon M, Araya R, Williams M. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. *Lancet Psychiatry.* 2016;3:973–982.
8. Din YM, Munir SI, Razzaq SA, et al. Risk perception of COVID-19 among pregnant females. *Ann King Edward Med Univ.* 2020;26:176–180.
9. Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med.* 2002;32(6):959–976.
10. Wisner K, Parry BL, Piontek CM. Clinical practice: Postpartum depression. *N Engl J Med.* 2002;347(3):194–199.