

A survey of the psychosocial impact of the COVID-19 pandemic on pregnant women attending a tertiary care centre of Eastern India – a cross-sectional study

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Abstract

Introduction: The COVID-19 pandemic presented an unprecedented challenge, and, as during the SARS outbreak in 2002, there was scope of overestimation of risk by pregnant women, leading to increased fear and anxiety. The aim of this study was to assess the psychosocial impact of the pandemic on pregnant women so better-informed decisions can be taken to spread awareness and alleviate their anxieties.

Material and methods: This was a cross-sectional study in a single tertiary care centre of Eastern India including 292 participants. The inclusion criteria were all pregnant women of any gestational age attending the All India Institute of Medical Sciences, Bhubaneswar for antenatal check-up or delivery. The exclusion criteria were patients with severe morbidities and patients not willing to participate. The primary outcome was to determine the psychosocial impact of the COVID-19 pandemic on pregnant women and to measure the anxiety level of pregnant women during the COVID-19 crisis. The secondary outcome was to determine the correlation between demographic aspects and psychosocial impact of COVID-19 pandemic on pregnant women.

Results: A self-designed questionnaire was used. Anxiety was scored using the generalised anxiety disorder scale. More than half the participants (57.9%) were not at all worried about acquiring the infection. Of all, 99.3% were scored to have no anxiety and 0.7% had moderate anxiety. Significant association of the level of anxiety was found with living with people at high risk of contracting the disease ($p = 0.002$).

Conclusions: The widespread awareness activities were effective and successful, as the pregnant women at the grassroots level faced minimal anxiety and were aware and assured. Studies like this help to provide feedback and formulate educational activities in future pandemics. The change in the effect on people, from panic in the previous pandemics to assurance in the current one, as found in our study, indicates the commendable work done to spread well founded information far and wide by the government, health care institutions, and workers.

Key words: COVID-19 in pregnancy, psychosocial impact, COVID-19 psychosocial impact on pregnancy, pandemic, pregnancy in pandemic.

Introduction

The COVID-19 pandemic, which began in December 2019 and has continued to spread worldwide throughout the last 2 years, has not just led to the loss of human life but also presented an unprecedented challenge through widespread social disruption. Billions of people have faced restrictions due to varying degrees of confinement such as banning public transport, restricting movement, and imposing a 14-day quarantine after travel [1]. Prolonged periods of isolation, bereavement, and losses of jobs and incomes have had a huge impact on the mental wellbeing of people. Pregnant women are particularly affected because they are naturally concerned about the safety of their baby and existing children. Pregnancy-related shifts in sex steroids and monoamine neurotransmitter levels, dysfunction

of the hypothalamic pituitary-adrenal axis, thyroid dysfunction, and alterations in immune response are all associated with an increased risk for mood disorders [2]. Anxiety, sleep disorders, and functional impairment are common [3, 4].

During SARS outbreak in 2002, a substantial proportion of pregnant women overestimated their risk of infection, which led to increased fear and anxiety among them [5, 6]. Such fear and unwarranted anxiety resulted in adverse effects on both the foetus and the mother, as well as to unnecessary interventions like premature terminations and abortions. Also, there were countless misconceptions and misapprehensions, especially in backward and rural societies. Large-scale propaganda was undertaken to spread correct information regarding COVID-19, and stringent safety measures were incor-

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porated, but they were mostly generalised, and information aiding the psychological stress on the masses came much later. The aim of our study was to assess the psychosocial impact of the current pandemic on pregnant women, which in turn reflects the awareness among them of the effect of the infection on pregnancy. This study would also help us to analyse the extent and effect of the anti-pandemic activities in alleviating the fears and anxieties of special populations and also to find lacunae so that better informed decisions can be taken to spread targeted awareness to support not just the physical but also the mental well-being of the population in the current as well as future pandemics.

The primary objective was to measure the anxiety level of pregnant women during the COVID-19 crisis. The secondary outcome was to assess the correlation between various demographic aspects of the pregnant women and the psychosocial impact of the COVID-19 pandemic on them.

Material and methods

Design: cross-sectional study

After obtaining approval from the institutional ethics committee on 20 June 2020, recruitment was started. The initial study duration of 3 months had to be extended due to the nationwide lockdown and reduced patient inflow into the hospital. Data collection was completed by February 2021.

Inclusion criteria:

- all pregnant women of any gestational age attending the All India Institute of Medical Sciences, Bhubaneswar for antenatal check-up or being admitted for delivery.

Exclusion criteria:

- patients with severe morbidities who were not in a condition to respond to the questionnaire (like eclampsia/severe pre-eclampsia, heart disease in failure, antepartum haemorrhage, other unstable haemodynamic conditions, those requiring intensive care support) and those with pre-existing psychiatric disorders,
- patients not willing to participate in the study.

Study size

Taking the prevalence of the psychosocial impact of a similar (SARS) pandemic on pregnant women from a previous study as 30%, a sample size of 366 was reached at (by using the formula $4pq/d^2$ where p is 30, Q is $100-p$, and d is allowable error) with absolute precision taken at 5%.

A structured self-designed questionnaire was used, which was pre-tested among 8–10 subjects.

The first part of the questionnaire was a demographic profile, the second part comprised qualitative questions assessing the effect of the pandemic on behavioural, psychological, and social aspects, while the third part of the questionnaire was a quantitative scoring of their anxiety using the generalised anxiety disorder scale (GAD-7) scoring system.

Statistical analysis

All the demographic parameters were expressed statistically as mean, median, and percentage. The educational status of the participants was considered as good or poor depending upon whether they had received secondary or primary education, respectively. Socioeconomic status was calculated using modified Kuppaswamy scale in which lower, upper lower, and lower middle were taken as 'low socioeconomic status', while upper middle and upper class were taken as 'high socioeconomic status'.

The qualitative assessment questions included different scenarios resulting from the pandemic and how much the women were worried by them, and their responses were measured in a 4-point Likert scale as not at all worried, somewhat worried, moderately worried, and very much worried. These were also expressed as percentages.

The Generalised Anxiety Disorder Scale is a scoring system based on 7 psychological aspects, with the response to each component characterised by how frequently it is felt by the participant. The responses are scored 0–3, 0 being never and 3 being for the feeling nearly every day, making a total score of 21. The final score is classified as 0–5 no anxiety, 6–10 mild anxiety, 11–15 moderate anxiety, and 16–21 severe anxiety. This was used for quantifying the level of anxiety of the participants.

Analysis was done using SPSS by IBM version 28. All the data was expressed using means, medians, and percentages. Association was calculated employing Fisher's exact test with a p -value < 0.05 taken as significant association.

Strengths

The study was performed at the peak of pandemic, depicting an accurate scenario. It included a large sample size, used standard scales (GAD-7), and assessment was done by face-to-face interview.

Limitations

The pregnant women were assessed only at a single tertiary care centre, there was a lack of longitudinal follow-up, and limited generalisability.

Table 1. Demographic variables

Parameters	Frequency (N = 292)	%
Age (in years)		
Maximum	50	
Minimum	18	
Mean	27.2	
Residence		
Urban	81	27.7
Rural	211	72.3
Socioeconomic status		
Low	128	43.8
High	164	55.1
Parity		
Nullipara	179	61.3
Multipara	113	38.7
Religion		
Hindu	282	96.6
Muslim	6	2
Christian	4	1.4
Education		
Poor	71	24.3
Good	221	75.7
Occupation		
Employed	22	7.5
Unemployed	270	92.5
Gestational age		
First trimester	2	0.7
Second trimester	8	2.7
Third trimester	282	96.6
Suspect/confirmed COVID-19 positive		
Yes	22	7.5
No	261	89.4
Don't know	9	3.1
Recent travel history		
Yes	5	1.7
No	287	98.3

Results

A total of 292 women were assessed during this study. The age of women included was 18–50 years with a mean age of 27 years. Most of our study population (72.3%) were from rural areas, and only 7.2% were employed. Fifty-six per cent of the women were of high socioeconomic status. The majority, i.e. 96.6% of the women, followed Hinduism (Table 1).

Of the 292 women, 179 (61.3%) were nullipara, and most of them (96.6%) were in their third trimester. Only 5 (1.7%) had a recent travel history, and 22 (7.5%)

claimed to have had contact with a suspected/confirmed COVID-19 case (Table 1).

More than half the participants (57.9%) said that they were not at all worried about acquiring the infection. Very few of them expressed their worry of stigmatisation and facing arguments in the community as somewhat and moderate (around 8–20% and 1%, respectively) whereas none of them were very much worried. Most of them were found to be not at all worried regarding the place or mode of delivery (77.4% and 70.2%, respectively) (Table 2).

During the pandemic, with respect to their ease of access to basic daily necessities, nutrient-rich foods, and medications, only around 1–2% reported that they were worried moderately or very much. A large proportion (97.6% and 99.7%) were not at all worried about their inability to satisfy food cravings and water contamination, respectively (Table 2).

Among 113 (38.7%) multipara women, 23 (15.2%) agreed to being worried regarding transmission to existing children. With the pandemic restriction, most participants (more than 80%) confessed to being worried due to decreased social activities, social contact with friends, and intimacy with their partners. Regarding being affected economically, half of the women expressed no worry, and the rest were found to be worried, with most (35.6%) being somewhat worried (Table 2).

With regards to management of pregnancy if affected with COVID-19 in the antenatal period, the majority of the women (more than 50%) felt that it was unknown. Around 20% were aware that pregnancy can be continued, and 12% and 9% believed termination of the pregnancy was warranted when infected before and after 13 weeks of gestation, respectively (Table 3).

Generalised anxiety disorder scoring was used to assess the anxiety levels of the study participants. Out of the 292 study participants, 99.3% were scored to have no anxiety and 0.7% had moderate anxiety.

On assessing the association of anxiety (GAD score) with variables like demographic profile, travel history, contact with suspects or cases, and reduced social activity, significant association was found with living with people at high risk of contracting the disease ($p = 0.002$). These women were mostly health care workers or were living with one and had moderate anxiety on GAD-7 scoring (Table 4).

Discussion

There have not been many studies exploring the psychosocial and behavioural impact of pandemics on pregnant women, especially from rural backgrounds. Stressors like movement restrictions, widespread lockdowns, and curfews, reduced social activities, financial crises, safety of existing children, and difficulty in access to routine care in this sensitive time of their lives can

Table 2. Socioeconomic impact of the COVID-19 pandemic on daily life (N = 292)

Worried about	Very much so	Moderately so	Somewhat	Not at all
Acquiring the infection	4 (1.4)	5 (1.7)	114 (39.0)	169 (57.9)
Stigmatisation if symptomatic/suspect/positive	0 (0)	4 (1.4)	57 (19.5)	231 (79.1)
Facing arguments/fights in community	0 (0)	3 (1.0)	24 (8.2)	265 (90.8)
Transmission to existing children if symptomatic (where applicable)	4 (2.6)	4 (2.6)	15 (10.0)	127 (84.6)
Access of routine antenatal care/ease of access	3 (1.0)	4 (1.4)	23 (7.9)	262 (89.7)
Place of delivery	3 (1.0)	2 (0.7)	61 (20.9)	226 (77.4)
Uncertainty of mode of delivery	4 (1.4)	5 (1.7)	78 (26.7)	205 (70.2)
Care of self and newborn post-delivery i/v/o relatives not being allowed to travel and stay along	3 (1.0)	3 (1.0)	24 (8.2)	262 (89.7)
Ease of access to medication and special/ nutrient rich foods	5 (1.7)	2 (0.7)	8 (2.7)	277 (94.9)
Ease of access to basic daily necessities	5 (1.7)	2 (0.7)	9 (3.1)	276 (94.5)
Inability to satisfy food cravings	0 (0)	2 (0.7)	5 (1.7)	285 (97.6)
Water contamination	0 (0)	1 (0.3)	0 (0)	291 (99.7)
Decreased social activities	19 (6.5)	32 (11.0)	219 (75.0)	22 (7.5)
Decreased intimate contact with partner(husband)	14 (4.8)	26 (8.9)	220 (75.3)	32 (11.0)
Decreased social contact with friends	18 (6.2)	31 (10.6)	222 (76.0)	21 (7.2)
Special leave arrangement for working women (where applicable)	0 (0)	0 (0)	13 (40.6)	19 (59.3)
Being affected economically	18 (6.2)	21 (7.2)	104 (35.6)	149 (51.0)

Table 3. Knowledge of management of COVID-19 during pregnancy (N = 292)

Management of COVID-19 in pregnancy	Continue pregnancy	Termination of pregnancy	Caesarean section	Unknown
Before 13 weeks	65 (22.3)	35 (12)	11 (3.8)	181 (62)
After 13 weeks	60 (20)	26 (8.9)	50 (17.1)	156 (53.4)

have different outcomes in different pregnant women. As public awareness and accessibility to reliable information has been improving, the behavioural patterns of the people have changed. Hence, our results, though similar, have some differences from past studies and studies in other countries.

Having been conducted in a tertiary care centre in eastern India, which caters to patients from all over the state of Odisha and border areas of adjacent states, our study population mostly (72.3%) had a rural background but good education (75.7%). Conversely, a similar Indian study by Jelly *et al.* and a Spanish study by Puertas-Gonzalez *et al.* included a more urban population with good educational status [7, 8]. Similarly, the studies by Hashim *et al.* [9], Guner *et al.* [10], Hübner *et al.* [11], and Diamanti *et al.* [12] were on a more educated and urban population.

Owing to the extensive and far-reaching campaigning by the government, more than 80% of our women were not at all worried about getting infected, or facing arguments or stigmatisation in their society. Teleconsultation facilities, online appointments for antenatal check-ups, multiple psychiatry helplines by hospitals, and

availability of most consumables via mobile shops and 24/7 pharmacies ensured that more than 70% of our participants were not all worried, indicating a zero to mild psychosocial impact of the pandemic on them. Similar observations were made in one of the first studies of this kind in the United Arab Emirates [9], in Bosnia, Herzegovina, and Serbia [13], and Germany [11] by Hübner *et al.*, who used the Edinburgh Postnatal Depression Scale and Anxiety Sensitivity Index. Whereas comparable studies in Italy (2020) [14], China (2020) [15], and Greece (2023) [12] reported moderate to severe psychological impact on their participants calculated using the Impact of Event Scale-Revised Score and State Anxiety Inventory (STAI) scale, respectively.

More than 90% of our participants expressed mild worry with regard to their social lives being affected by the pandemic. With ample support from family members, the study of Hashim *et al.* reported comparable findings [9]. Relatable findings were made in the studies by Hübner *et al.* [11] and Diamanti *et al.* [12], which showed low levels of fear among the study populations. On the other hand, a similar study in the past in Hong Kong by Ng *et al.* during the SARS epidemic reported

Table 4. Association of anxiety score with other variables (N = 292)

Parameters	Anxiety		p-value
	NO	MILD	
Socioeconomic status			
Low	128	0	0.124
High	161	3	
Residence			
Rural	210	1	0.130
Urban	79	2	
Education			
Good	218	3	0.324
Poor	71	0	
Occupation			
Employed	22	0	0.619
Unemployed	267	3	
Parity			
Nullipara	177	2	0.848
Multipara	112	1	
Gestational age			
First trimester	2	0	0.638
Second trimester	63	0	
Third trimester	216	3	
Suspect/confirmed in neighbourhood			
No	259	2	0.229
Yes	21	1	
Don't know	9	0	
Recent travel history			
No	284	3	0.818
Yes	5	0	
Living with people at high risk			
No	282	2	0.001
Yes	7	1	
Decreased social activity			
Not at all	20	1	0.331
Somewhat	220	2	
Moderately so	31	0	
Very much so	18	0	

moderate to severe worry in pregnant women due to their reduction of social activities [16]. This depicts the stark difference in the effect of previous outbreaks on the mindsets of the population.

We used GAD-7 scoring to assess the level of anxiety in the women included. Almost all women were found to have no anxiety as per the scoring system, but the few participants (0.7%) who were found to have moderate anxiety were health care workers. Similarly, in another Indian study, minimal anxiety levels were observed using the same GAD-7 scoring [7]. Comparatively,

a study conducted on health care workers using GAD-7 scoring, like us, revealed mild-moderate anxiety among its participants [17]. Conversely, in the study by Saccone *et al.* anxiety scoring was done using Spielberger STAI, and most women (> 65%) were found to have moderate anxiety [14]. Also, Preis *et al.*, using GAD-7 scoring reported moderate-severe anxiety in more than 40% of pregnant women [18].

We compared anxiety levels with participants' education, socioeconomic status, employment status, residence, parity, gestational age, decreased social activity, recent travel and contact with suspect/confirmed cases, and when living with people at high risk of infection. We found significant association between anxiety score and having high-risk family members ($p = 0.001$). In the Italian study, significant association was found with visual analogue scale for vertical transmission of disease, which resulted in most women opting for cell-free foetal DNA testing in their first trimester [14]. Jelly *et al.* reported that anxiety levels were significantly associated with education, residence, awareness about COVID-19, monthly income, as well as marital and family support [7]. Preis *et al.* found that high-risk pregnancy, preparedness stress, and perinatal infection stress independently predicted a greater likelihood of moderate to severe anxiety [18]. In the study by Puertas-Gonzalez *et al.* higher levels of anxiety were seen in women who were infected during pregnancy compared to those who were not [8].

Conclusions

Infectious disease outbreaks, especially pandemics, throughout history have not just affected people physically and economically but have also had huge impacts on their social lives and psyche. There have been multiple advisories, advertisements, and campaigns regarding behavioural practices for disease prevention but not many addressing the psychological aspect of the disease on the people. In pregnant women, who are already vulnerable due to their physiological condition, pandemics and the panic surrounding them can have a much greater impact, especially the stress of perinatal infection and transmission to existing children. In such a scenario, the role of health care workers becomes much more important, wherein they need to provide medical service and bust myths and provide reliable information to the pregnant women.

The change in the effect on people from panic in the previous pandemics to assurance in the current one, as found in our study, indicates the commendable work done to spread well-founded information far and wide by the government, health care institutions, and workers. Publication of more studies of this kind, especially from less affluent and educated populations, can have a great influence on policy makers in directing fu-

ture awareness strategies, resulting in a sense of 100% security and safety among all.

Disclosure

The authors report no conflict of interest.

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