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Knowledge, attitude, perceptions, and concerns of pregnant and lactating women regarding COVID-19 vaccination: A cross-sectional survey of 313 participants from a tertiary care centre of North India



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ABSTRACT

Aim: The study aimed to assess the knowledge, attitude, perceptions, and concerns of pregnant and lactating women regarding COVID-19 vaccination.

Methods: A cross-sectional survey was conducted using a pre-validated questionnaire to assess the knowledge, attitude, perceptions, and concerns about COVID 19 vaccination among pregnant and lactating women.

Results: Most (90%) of the study participants (n = 313) agreed that it was essential to get vaccinated for COVID-19 and were aware that pregnant (72.2%) or lactating women (65.2%) are eligible for vaccination. There was a significant positive association between willingness to pay for the vaccine and the socio-economic status (p < 0.01). Women residing in rural areas wanted to wait to see the effect of the vaccine on other pregnant and lactating women (p < 0.001). The major factors associated with vaccine hesitancy were unforeseen future effects of vaccines on the foetus (58.6%) and rapid development and approval of vaccine without including pregnant and lactating women in vaccine trials (53.6%). These factors were positively associated with socioeconomic status (p < 0.05) and residence (p < 0.01).

Conclusion: The safety concerns regarding the COVID-19 vaccine is a major reason for vaccine hesitancy. The policymakers should advocate, investigate, and publicize relevant data on vaccine efficacy and safety among these women.

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1. Introduction

Vaccine hesitancy is a known phenomenon impeding COVID-19 vaccine acceptance among various population groups across the globe [1]. Vaccine hesitancy has different attributes in varied socio-cultural contexts which lie in a continuum between total acceptance to refusal. This is mostly associated with knowledge, attitude, perceptions, and concerns about the vaccine [2]. Besides, these factors also differ among the various population groups such as pregnant and lactating women.

Few studies have attempted to assess one or more of the above-mentioned factors in western countries to gain behavioural insights and suggest strategies for vaccine uptake but there is no literature

available for any of the factors in India [3–5]. This necessitates studying these variables in the socio-cultural context of India. The present study was planned to assess the knowledge, attitude, perceptions, and concerns of pregnant and lactating women regarding COVID-19 vaccination and also evaluate the factors associated with awareness and acceptance of the COVID-19 vaccine to their socio-demographic variables.

2. Methods

A cross-sectional study was conducted using a pre-validated questionnaire at the Department of Obstetrics and Gynaecology. The study was approved by the Institute Ethics Committee with IEC-777/12.11.2021, RP-34/2021. The survey was done using an adapted questionnaire assessing knowledge, attitude, facilitators, and barriers to COVID-19 vaccination among the general population with a Cronbach's alpha of 0.86 [6]. The questionnaire was modified for the target population by adding 1 item in attitude, 4 in barriers domain, and pre-tested on 10 pregnant and 5 lactating

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women. The questionnaire was divided into two sections. Section A comprises socio-demographic information, obstetric history, previous COVID-19 infection, and vaccination history. Section B consisted of questions related to knowledge, attitude, facilitators, and barriers to COVID-19 vaccination. The questionnaire was administered as an interview schedule. Participants were enrolled by the purposive sampling technique. The data were gathered from both inpatient and out-patient departments from November 2021–December 2021. The sample size was calculated using a single population proportion formula, by considering the following assumption, $P = 81.6\%$ proportion of COVID-19 vaccine acceptance, $d =$ margin of error taken as 4% , $Z_{\alpha/2} = 1.96$ at 95% confidence level, and by adding 10% non-response rate the final sample was 270 [7]. The data were analyzed using the SPSS version 26 (IBM® SPSS®). P-value ≤ 0.05 was considered statistically significant for the analyses.

3. Results

The key results are summarised in Table 1 and their description is provided below:

Socio-demographic profile: A total of 340 questionnaires were administered, after data purification 313 were subjected to final analysis. The mean age of the participants was 28.32 ± 4.62 years. Among the participants, two-thirds were pregnant and the remaining were postpartum. The detailed socio-demographic profile is given in Supplementary Table 1.

Knowledge regarding the COVID-19 vaccine: As shown in Supplementary Table 2, the majority of participants had limited knowledge about certain aspects of the COVID-19 vaccine.

Sources of information influencing the decision of vaccination: As depicted in Supplementary Table 3, the higher the education level and the socio-economic class, the more likely participants were to be influenced by reliable sources like the healthcare provider ($p < 0.05$) or government agencies ($p < 0.05$).

Attitude towards the COVID-19 vaccine: Overall, the participants had a positive attitude (Supplementary Table 4) towards the

COVID-19 vaccine. The higher the socio-economic class, the more was the motivation to take the vaccine ($p < 0.01$). However, women residing in rural areas were reluctant to take the vaccine while those belonging to urban areas were ready to take the vaccine without delay ($p < 0.001$).

Facilitators leading to acceptance of COVID-19 vaccine: As shown in Supplementary Table 5, vaccine acceptance was majorly driven by perceived safety, protective effect, transferring immunity to the baby, the influence of role models/political leaders/senior doctors. Participants living in metropolitan cities were more motivated by these factors ($p < 0.01$), as compared to other residential counterparts in the study.

Barriers associated with COVID-19 vaccine acceptance: Supplementary Table 6 outlines the reasons for vaccine hesitancy. Women with lower socio-economic status were more likely to perceive that vaccine may have a probable adverse effect on the unborn child ($p < 0.05$) as it was rapidly developed and approved without including pregnant & postpartum women ($p < 0.01$).

4. Discussion

Despite sincere efforts to increase public awareness and acceptability, the rate of vaccine uptake in pregnant and postpartum women is still low [8]. Only 21% of pregnant women visiting our hospital were fully vaccinated as compared to 49.5% of the general population [9]. Evidence indicates that accurate knowledge about the COVID-19 vaccine increases the likelihood of its acceptance. It provides an enabling environment, motivates as well as reduces barriers [10]. Thus, it is imperative to utilize the vast potential of social media to ensure the flow of accurate information following successful models of government-led vaccine campaigns like pulse polio, and henceforth, avoid any misinformation or disinformation about vaccines [11].

Our results also highlight that the women residing in rural areas have lower vaccine uptake. This is worrisome as almost 70% of the Indian population resides in rural areas [12]. Therefore, this calls for employing an intensive approach to deliver evidence-based

Table 1
Summary of key-findings.

Domain	Variables	Frequency (%)	Association with socio-demographic variables
Knowledge/Sources of knowledge	Groups eligible for vaccination	202(64.7)	Education ($p < 0.01$)
	Influence of government agencies	252(80.5)	Education ($p < 0.05$)
	Influence of social media	225(80.6)	Education ($p < 0.05$), Socio-economic group ($p < 0.05$)
	Influence of health care provider	270(85.4)	Education ($p < 0.05$), Socio-economic group ($p < 0.05$)
Attitude	Want to see effect on pregnant and lactating women	199(63.6)	Residence ($p < 0.001$)
	Willingness to pay for the vaccine	229(73.2)	Socio-economic group ($p < 0.05$)
Facilitators	No harm in taking the vaccine	187(59.1)	Residence ($p < 0.01$)
	Protection against COVID-19 infection	225(71.9)	Residence ($p < 0.01$)
	Transferring immunity against COVID-19 to baby	170(54.3)	Residence ($p < 0.01$)
	Benefits outweighing the risks of taking vaccine	208(66.5)	Residence ($p < 0.001$)
	Taking vaccine is a societal responsibility	241(68.4)	Residence ($p < 0.01$)
	Sufficient data regarding the vaccine's safety and efficacy is released by the government	214(68.4)	Residence ($p < 0.05$)
	Many people are taking the COVID-19 vaccine	226(72.2)	Residence ($p < 0.05$)
	Role models/political leaders/senior doctors/scientists have taken the COVID-19 vaccine	183(58.5)	Residence ($p < 0.01$)
Barriers	Being in first trimester of pregnancy	127(43.8)	Socio-economic group ($p < 0.05$)
	Immediate serious side effects after taking COVID-19 vaccine	142(45.6)	Residence ($p < 0.05$)
	COVID-19 vaccine was rapidly developed and approved without including pregnant & postpartum woman	168(53.6)	Socio-economic group ($p < 0.05$), Residence ($p < 0.01$)
	COVID-19 vaccine might have unforeseen future effects of vaccine on my unborn child	183(58.5)	Socio-economic group ($p < 0.05$)
	concerned that it may affect my baby through breast feeding	149(47.2)	Socio-economic group ($p < 0.05$), Residence ($p < 0.05$)

information. This can be done by not just healthcare providers but by training auxiliary workers, running door-to-door campaigns to specifically target pregnant and lactating women to not just motivate them for vaccination but also bust conspiracy theories and hoaxes.

To the best of our knowledge, this is the first study in India to assess knowledge, attitude, perceptions, and concerns regarding the COVID-19 vaccine among pregnant and lactating women. Other strengths of the study are its prospective design, novelty, and number of study parameters. The major limitation of the study can be self-reported responses that may lead to misreporting, recall bias, and social desirability bias.

5. Conclusion

The safety concern regarding the COVID-19 vaccine during pregnancy and lactation is a crucial factor leading to vaccine hesitancy. The policymakers should advocate large-scale trials to publicize data on vaccine efficacy and safety for pregnant and lactating women and devise strategies and awareness campaigns to reduce vaccine hesitancy.

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Declaration of competing interest

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.dsx.2022.102449>.

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