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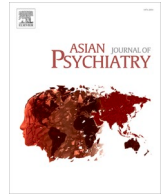
A brief psycho-social intervention for COVID-19 vaccine hesitancy among perinatal women in low-and middle-income countries: Need of the hour

Ramdas Ransing [a,*], Prerna Kukreti [b], Pracheth Raghuveer [c], Manju Puri [d], Amey Diwakar Paranjape [e], Suvarna Patil [f], Pavithra Hegde [g], Kumari Padma [a], Praveen Kumar [h], Jugal Kishore [i], Smita N. Deshpande [j]

[a] *Department of Psychiatry, BKL Walwalkar Rural Medical College, Sawarde, Ratnagiri, Maharashtra 415606, India*
[b] *Department of Psychiatry, Lady Hardinge Medical College, New Delhi 110001, India*
[c] *Department of Community Medicine, Kasturba Medical College, Mangalore, Manipal Academy of Higher Education, Karnataka 575001, India*
[d] *Department of Obstretics and Gyanecolgy, Lady Hardinge Medical College, New Delhi 110001, India*
[e] *Department of TB and Chest Medicine, BKL Walwalkar Rural Medical College, Sawarde, Ratnagiri, Maharashtra 415606, India*
[f] *Department of Medicine, BKL Walwalkar Rural Medical College, Sawarde, Ratnagiri, Maharashtra 415606, India*
[g] *Department of Community Medicine, Yenepoya Medical College, Mangalore, Karnataka 575018, India*
[h] *Department of Pediatrics, Lady Hardinge Medical College, New Delhi 110001, India*
[i] *Dept of Community Medicine, Vardhman Mahavir Medical College, Ansari Nagar West, New Delhi, Delhi 110029, India*
[j] *Dept. of Psychiatry, De-addiction Services & Resource Center for Tobacco Control, Centre of Excellence in Mental health, Atal Bihari Vajpayee Institute of Medical Sciences & Dr. Ram Manohar Lohia Hospital, New Delhi 110001, India*

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ABSTRACT

COVID-19 vaccines are one of the most effective strategies for preventing COVID-19 infection, as well as the associated mortality and morbidity. Despite the availability of COVID-19 vaccines, vaccine acceptance among perinatal women is challenging in low and middle-income countries (LMICs). Further, the vaccine hesitancy among perinatal women may have an impact on their children's vaccinations. The purpose of this paper is to briefly discuss the existing research on COVID-19 and non-COVID-19 vaccine hesitancy, psychosocial aspects, measures, and the individual level interventions for vaccine hesitancy among perinatal women. In our opinion, there is a need for further research with a specific focus on developing effective and feasible individual-level interventions to address COVID-19 vaccine hesitancy among perinatal women in LMICs.

1. Introduction

According to a recent Indian Council of Medical Research (ICMR) study, the case fatality rate of the Coronavirus Disease 2019 (COVID-19) among perinatal women during the second wave of COVID-19 was 5.7% (Sharma, 2021). Taking this into consideration, the Government of India and the World Health Organization (WHO) recently recommended COVID-19 vaccines for perinatal women (Sharma, 2021). Although there are several vaccines against COVID-19 that are approved for use, issues like vaccine hesitancy could be a major challenge towards successful vaccine uptake among perinatal women.

The Strategic Advisory Group of Experts on Immunization (SAGE) defines vaccine hesitancy as a delay in accepting or refusing vaccination despite the availability of vaccination services (MacDonald, 2015). The most frequently reported factors associated with vaccine hesitancy are complacency (a low perception of disease risk), convenience (availability, affordability, and delivery of vaccines), and confidence (trust in vaccination safety, effectiveness, and the competence of healthcare systems) (MacDonald, 2015).

2. Epidemiology of COVID-19 vaccine hesitancy

To date, several cross-sectional studies have been carried out to assess the COVID-19 vaccine hesitancy rates among the different populations such as medical students (Li et al., 2021), health care workers (El-Sokkary et al., 2021; Holzmann-Littig et al., 2021) patients with physical illness (Ko et al., 2021; Moujaess et al., 2021), children (He et al., 2021; Teasdale et al., 2021), young adults (Adams et al., 2021), as

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well as pregnant and breastfeeding women (Ceulemans et al., 2021; Mohan et al., 2021). Most these studies were conducted in western and high-income countries (HICs) and have reported a vaccine hesitancy rate of 10–50%. A study conducted in Israel reported that 25% of the general population were hesitant to get vaccinated and 30% of them were unwilling to vaccinate their children. Among the concerns expressed, 76% were safety-related and pregnancy was one of the components (Dror et al., 2020). A previous study of 341 pregnant and breastfeeding women in Qatar found a similar vaccination hesitancy rate (Mohan et al., 2021). Also, the vaccine hesitancy among pregnant Turkish women was 29.6% (Gencer et al., 2021). A nationally representative cross-sectional survey conducted in a country that belonged to the low and middle-income countries (LMICs) category found that the COVID-19 vaccine hesitancy rate among the general population was 32.5% (Ali and Hossain, 2021). Overall, the COVID-19 vaccine acceptance rate is reported to be higher in LMICs than HICs.

3. Determinants of COVID-19 vaccine hesitancy

Variations in the vaccine hesitancy and acceptance rates are attributed to a variety of factors. A systematic review reported that willingness for COVID-19 vaccination was influenced by various factors ranging from socio-economic status, education, and occupation to political will and trust in the government (Wake, 2021). Lack of information/ misinformation regarding vaccines along with risk perceptions, efficacy, and safety of new vaccines, accessibility, and cost also act as key determinants in vaccine acceptance (Truong et al., 2021). Development of vaccines in an expedited fashion, and political intervention were also reported to be the factors determining the acceptability of the vaccines (Lin et al., 2020).

In real-world settings, these factors are frequently complex, dynamic, unpredictable, and difficult to address. The WHO- SAGE model of determinants of vaccine hesitancy categorizes vaccine hesitancy factors into three domains: contextual (e.g., historical, environmental, health system, economic, or political factors), individual and group (e.g., personal or group perception of and attitude toward the vaccine), and vaccine and vaccination-specific issues (e.g., Vaccine characteristics, the process of the vaccination) (MacDonald and SAGE Working Group on Vaccine Hesitancy, 2015).

According to published literature, the determinants of COVID-19 vaccine hesitancy differ from vaccination against other infectious diseases. The main reasons are the evolving pandemic and vaccines, the newer variant, virus strains, misinformation circulating on social media, fake news, and anti-vaccine movements (Ransing et al., 2021). Further, people have different backgrounds, experiences, and beliefs related to COVID-19 vaccination. These factors further contribute to vaccine hesitancy (COVID Vaccine Hesitancy Score Part 2 | Manifold Data Mining, 2021). Historical data suggests the main reasons for hesitancy for influenza vaccination were lack of time to get vaccinated, poor awareness of the advantages of getting vaccinated and available sites for vaccination, fear of the vaccine contents, and previous bad experience with vaccination. Further, multiple determinants for COVID-19 vaccine hesitancy also include safety of the vaccine, concern about risks and side effects, wait and watch, and lack of felt need for vaccination (COVID Vaccine Hesitancy Score Part 2 | Manifold Data Mining, n.d.). Promoting the uptake of COVID-19 vaccines will require understanding whether people are willing to be vaccinated, the reasons why they are willing or unwilling to do so, and the most trusted sources of information in their decision-making.

4. Antecedents of COVID-19 vaccine hesitancy among perinatal women

The antecedents are the psycho-social reasons or determinants within an individual that are related to an individual's vaccination behaviour (Betsch et al., 2018). The five main individual-level

antecedents associated with vaccination behavior are confidence, complacency, constraints, calculation, and collective responsibility (Betsch et al., 2018). The experiences, beliefs, and circumstances related to COVID-19 vaccination among perinatal women may be different from those of the general population. In our pilot (unpublished) survey of 150 perinatal women, we found that and 86% of the pregnant women and 35% of the postnatal women were vaccine-hesitant. The main concerns associated with vaccine hesitancy were myths and misconceptions, certain religious beliefs, social factors, lack of knowledge lack of interest or need to get vaccinated, apprehension regarding vaccine safety in general and for fetuses, infants (e.g.,breastfeeding), and fear of getting infected at the vaccination site. Our unpublished data and data from the Turkish study suggest that vaccine hesitancy among perinatal women may lead to an increase in non-vaccination of their children for both COVID-19 as well as non-COVID-19 diseases (Gencer et al., 2021). Thus, addressing the vaccine hesitancy among perinatal women is imperative for developing attitudes and beliefs about childhood vaccinations.

5. Assessments of COVID-19 vaccine hesitancy in practice

In our experiences, the usual care for vaccine-hesitant perinatal women in India is, in effect, no care at all. This is primarily because most perinatal women are not screened for vaccine hesitancy towards COVID-19 vaccination and neither do they receive any intervention. Measuring the psychosocial antecedents is a complex process due to the dynamic and unpredictable nature of the COVID-19 pandemic and infodemic. Several studies mainly from western countries have measured these antecedents using COVID-19 vaccine hesitancy scales (Table 1). However, these self-reported scales need to be translated and validated into the local languages before their use in practice in LMICs. Measuring the determinants of vaccine hesitancy is invaluable to develop a specific, acceptable, and effective vaccine hesitancy intervention (VHI) for perinatal women.

Table 1
COVID-19 vaccine hesitancy scales.

Scales /Tools	Psychometric properties in brief
Oxford Covid-19 Vaccine Hesitancy Scale	Self-reported, seven items, Likert scale, Excellent internal consistency (Cronbach's alpha= 0.97) and concurrent validity with vaccine hesitancy scale (r = 0.47) (Freeman et al., 2020; Shapiro et al., 2018).
Oxford COVID-19 Vaccine Confidence & Complacency Scale	Self-reported, fourteen items, Likert scale, Assesses the two psychological antecedents (i.e. confidence and complacency) (Betsch et al., 2018; Hossain et al., 2021)
Adult Vaccine Hesitancy Scale (aVHS)	Self-reported, ten items, Likert scale, good internal consistency and concurrent validity (Akel et al., 2021)
Adaption of vaccine hesitancy scale for COVID-19 vaccinations	Self-reported, seventeen items, Likert scale, good internal consistency and concurrent validity, items adapted form vaccine hesitancy scale and developed using health belief model (Rodriguez et al., 2021).
5 C Scale for Assessment of COVID-19 Vaccines Psychological Antecedents	Self-reported, fifteen items, Likert scale, Adaption of 5 C scale for COVID-19 Psychological antecedents (confidence, complacency, constraints, calculation, and collective responsibility) (Betsch et al., 2018; Ghazy et al., 2021; Hossain et al., 2021)
Childhood Vaccine Hesitancy Scale (CVHS) for COVID-19 and non-COVID-19 Vaccines	Self-reported, Likert scale, modified Vaccine Hesitancy Scale (VHS) for COVID-19 (He et al., 2021)

6. Strategies for addressing the COVID-19 vaccine hesitancy

Strategies for addressing COVID-19 vaccine hesitancy can be broadly classified into four categories such as policy and community-level interventions (e.g., reducing the cost of vaccine), organization-level interventions (e.g., home visit, reminder, feedbacks), interpersonal-level interventions, (e.g., recommendation by clinicians to their patients), and individual-level interventions (e.g., addressing the individual level concerns and barriers) (Finney Rutten et al., 2021).

The Indian government has taken several steps to ease the vaccination process such as online registration, awareness on social media, a manual for counseling of pregnant women, and reminder messages (My Gov, n.d.). In our experiences, the obstetrician and pediatrician are educating the women by offering information about the COVID-19 vaccines and the available vaccination sites. However, these interventions do not specifically focus on addressing the issues of vaccine-hesitant perinatal women. So far, two sequential randomized controlled trials (RCTs) have assessed the impact of behavioral interventions on COVID-19 vaccine uptake. Text-based reminders have increased the appointments and vaccination rates within the healthcare system by 6.07 (84%) and 3.57 (26%) percentage points, respectively (Kozlov, 2021). Therefore, the individual-level vaccine hesitancy interventions (VHI) coupled with text-based reminders could be an effective intervention to improve the uptake of COVID-19 vaccination among perinatal women in LMICs.

7. Individual-level Vaccine Hesitancy Interventions (VHI) and their implementation in LMICs

Interventions that are focused on generating awareness or based on social media are ineffective in addressing vaccine hesitancy at an individual level. Hence, there is an urgent need to develop VHI to address the key psychological antecedents of COVID-19 vaccine hesitancy among perinatal women in LMICs. Taking these challenges into account, we (a National level team of Psychiatrists, Psychologists, Public Health Specialists, Obstetricians, Pediatricians, and Social Workers) have proposed a brief outline of VHI that can be implemented in India (Table 2). Our proposed VHI is a dialogue-based individual-level intervention that utilizes the components of a problem-based approach, 5 C model of vaccine hesitancy, motivational interview techniques. In previous studies, motivational enhancement therapy was found to be effective in increasing vaccine (non-COVID-19) acceptance rate among various subgroups of the population (Olson et al., 2020). However, COVID-19

pandemic is evolving in an unpredictable manner as also psychological reactions to the pandemic and its restrictions. In such a case, the decision of vaccine-hesitant perinatal women may be influenced by a variety of other factors, such as social media and public health efforts. Also, there is no umbrella concept that embraces all antecedents at the time of development. Therefore, the VHI should be a living document that can be constantly edited and updated to address the emerging psychological responses to the pandemic.

A survey conducted in LMICs on 44,260 participants found that the health care workers (HCWs) are the most trusted sources of guidance about COVID-19 vaccines (Solís Arce et al., 2021). India has a strong and reliable workforce of primary HCWs like Junior Health Assistants (JHAs) and Auxiliary Nurse Midwives (ANMs) (Ransing et al., 2020). Therefore, developing a feasible and scalable HCW-based VHI for perinatal women is the need of the hour. Further, the discussions on vaccinations against COVID-19 virus may be considered as an opportunity to provide correct information on vaccinations (COVID-19 and non-COVID-19) at primary level. To accomplish this, VHI should be delivered in a single session of 25–30 min via phone/video calls (WhatsApp®) or in-person consultation. In-person consultation will help in overcoming implementation barriers (e.g., digital literacy) in rural and remote settings. The telephonic reminders are an effective strategy for encouraging participants for COVID-19 vaccination (Kozlov, 2021). However, HCWs should follow up with the vaccine-hesitant perinatal women at periodic intervals and during their routine antenatal visits in LMICs.

8. Future directions

In our opinion, individual-level interventions as outlined above can be effective in reducing vaccine hesitancy among perinatal women and increasing the COVID-19 vaccine acceptance rate. In addition, these interventions may address the determinants of COVID-19 vaccine hesitancy and childhood COVID-19 vaccine hesitancy and the suggested interventions may be feasible and acceptable in rural and remote regions and LMICs. However, there is a strong need to undertake targeted research efforts like systematic identification of multi-level factors associated with vaccine hesitancy and delivery of VHI in different settings (e.g., hospital, rural). These interventions will be more acceptable, applicable, culturally appropriate, and evidence-based as a result of research efforts. Further, involving primary HCWs, as well as using video conferencing and phone calls to deliver the intervention, may be a more cost-effective, feasible, sustainable, and scalable approach for national programs [e.g., National Immunization Programme, Reproductive Maternal Neonatal Child and Adolescent Health Programme (RMNCH+A)] and in current pandemic settings. Furthermore, this approach seeks to incorporate COVID-19 vaccination into the existing maternal and child health programs, thereby increasing the accessibility and cost-effectiveness of COVID-19 vaccination, particularly in resource-constrained settings.

9. Conclusion

The COVID-19 vaccine hesitancy among perinatal women could adversely affect the uptake of vaccination among perinatal women and their children. It is critical to investigate the factors or drivers associated with vaccine hesitancy to develop an evidence-based, individual-level intervention to address the various determinants of COVID-19 vaccine hesitancy. HCW-based approaches for screening and addressing vaccine hesitancy should be attempted because such approaches may be more feasible, sustainable, and acceptable in LMICs.

Table 2
Suggested brief outline of Vaccine Hesitancy Intervention (VHI) for COVID-19.

Target population:	Vaccine hesitant perinatal women
Administrator:	Primary HCWs (e.g., Junior nurse or ANM)
Mode of administration:	In-person consultation, Telephone, or Online/Digital
Type of intervention:	An individual-level, Living document, Dialogue-based + Reminder system
Determinants targeted:	General vaccine hesitancy, Misinformation, Perceived benefits, Safety issues, Religious and philosophical views, Trust, Information about vaccine and vaccination sites
Session and Time required:	Single (25–30 min)
Administration and components of VHI	• Step I: Establishment of rapport • Step II: Assess, Ask, Acknowledge, Address, and Advise • Step III: Motivational intervention using components of motivational enhancement therapy. • Step IV: Address the specific determinants of vaccine hesitancy (confidence, complacency, constraints, calculation, and collective responsibility) • Step V: Make strong recommendations and advise on miscellaneous issues (e.g., pro-social behavior, post-vaccination care)

Conflict of Interest

The authors declare that they have no conflict of interest.

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