Global Journal of Medicine & Public Health

Acceptance and perceptions towards covid vaccination among pregnant and lactating women in a tertiary care centre in coastal india

Shannon Fernandes, Rithesh Dcunha, Sujaya v Rao

ABSTRACT

Vaccination is a very important step in reducing the spread of COVID-19 by way of herd immunity. Vaccine hesitancy among pregnant women is particularly high despite professional bodies strongly endorsing the vaccine. Many pregnant women are not willing to be vaccinated due to safety concerns despite the reassurance that vaccines are safe during pregnancy without any additional complication during pregnancy. Our study aims at identifying the attitudes towards COVID-19 vaccine acceptance as well as non-acceptance in pregnant and lactating women. A cross sectional study was conducted on 454 pregnant and post natal mothers of Father Muller Medical College. Data was collected from a face-to-face questionnaire which included demographic characteristics of study participants and a set of questions to test the Knowledge and Attitude towards COVID-19 vaccination in pregnancy. All participants were aware about the vaccine's availability; however, 80.93% were uncertain about its benefits. The primary reasons for hesitancy included familial influence (82.6%) and safety concerns (87% believed the vaccine might cause infection, 81.05% feared fetal harm). Only 17.62% of the study participants believed in the vaccine's efficacy. Participants showed limited understanding of COVID-19's impact on pregnancy, underscoring the need for improved health education.

Key-words: KAP, Covid Vaccine, Pregnancy

GJMEDPH 2026; Vol. 15, issue 2 | OPEN ACCESS

1*Corresponding: Shannon Fernandes , associate professor, dept of obg, father muller medical college, mangalore, Ferns4@fathermuller.in, 9620470688;2.Rithesh Dcunha associate professor, dept of anaesthesiology, father muller medical college, mangalore; 3. sujaya v rao, professor ,dept of obg, father muller medical college, mangalore.

Conflict of Interest—none | Funding—none

INTRODUCTION

Vaccination is a very important step in curtailing the spread of COVID-19 [1]. It has been suggested by WHO that vaccination is the most appropriate approach to build herd immunity [2]. In comparison to the general population, pregnant women are at a higher risk of not only contracting COVID-19 infection but they subsequently develop a severe form of the illness and experience adverse pregnancy outcomes [3-4]. Pregnant women have a higher risk of hospitalization and are at an increased risk of requiring ICU admission, because pregnancy is an immunosuppressive state [5], and as the uterus enlarges during pregnancy it compresses the lungs thereby reducing the air entry with each breath that a pregnant women takes [6]. Pregnancy complications like an increased risk of preterm birth and NICU admission of the neonate have also been associated with COVID-19 infection. Prevention of the spread of the disease, therefore is important given all these risks [7-8]. Initially, only pregnant women who were considered high risk for acquiring the infection were recommended for vaccination by the WHO [9]. Eventually, with the accumulation of safety data [10-12] on vaccination and the ensuing harmful effects of COVID-19 infection on a pregnant women, the vaccine was unequivocally recommended for all pregnant women [13]. Pregnant women are hesitant to take the vaccine despite professional bodies strongly endorsing the vaccine [14-15]. Many pregnant women are not willing to be vaccinated due to safety concerns both for themselves and for the unborn baby despite the reassurance that vaccines are safe during pregnancy without any additional complications [16-18]. Also, those pregnant women who do not feel vulnerable to the infection are hesitant to take the vaccine [19].Providing adequate information is an effective method of improving COVID-19 vaccine uptake and acceptance among pregnant women [19-23] and strategies that prioritize vaccination of pregnant people are needed.Our study aims to identify vaccine acceptance and hesitancy attitudes towards COVID-19 vaccination in pregnant and lactating women in a tertiary care center in South India. The results, in turn, will help implement policies to increase vaccine acceptance particularly among the pregnant and post-partum population.

Materials and methods:

This cross-sectional study was conducted at Father Muller Medical College, Mangalore over a period of 6 months. Patients attending the outpatient department and those admitted to the hospital wards were included. A total of 454 pregnant and postpartum patients who consulted the hospital during the study period were recruited for the study.Inclusion criteria: All pregnant and post partum women upto 6 weeks post child birth attending the OBG outpatient Department and willing to participate in the study were included.Exclusion criteria: Patients with severe medical or surgical co-morbidities or those unwilling to participate were excluded. After recruitment, informed consent was obtained from the participants. A questionnaire was created, which included demographic characteristics of study participants and a set of questions to assess knowledge and attitude towards COVID-19 vaccination in pregnancy. The questionnaire was available in both English and Kannada. Data was collected using a face-to-face interviews, any doubts or misunderstandings about the questions were immediately clarified. The questionnaire was validated for content and relevance by 2 faculty members from the OBG department.

The working definitions used while creating the questionnaire

- Knowledge was defined as the participant's regarding the effects of COVID-19 on the fetus, mother and various aspects regarding covid vaccination.
- Attitudes were defined as feelings and beliefs regarding the pandemic,the impacts of infection on maternal and fetal health, and preventive measures.

Statistical analysis:

The reliability of questionnaire to record the participant responses was analysed using

Cronbach's alpha. Statistical analysis included frequency, percentage and Chi-square test.

Sample size: $n = Z^2 \alpha\, p\,(1-p)/ e^2$

n= 454 , e= 4%

Sample size equals the square of the Z-value multiplied by the population proportion and its complement, divided by the square of the margin of error

n = Required sample size (the number of respondents or observations needed)

Z_α = Z-value or standard normal value corresponding to the desired confidence level

p = Estimated proportion of the population having the characteristic of interest

1−p = Proportion not having the characteristic

e = Margin of error (allowable error or precision level)

α = Level of significance

Results:

A total of 454 women participated in the study and were considered for the final analysis. Of these, 72.23% were below 30 years of age and 27.74% of pregnant women were of 31 to 40 years. More than 80% belonged to urban areas. 80% of the women had an education level of 10th standard. Most of the women were housewives (88.32%). Out of 454 women, around 53.28% were multiparous, while 46.68% of women were nulliparous. 12.55% were in the 1st trimester, 35.9% were in the 2nd trimester, 39.64% were in the 3rd trimester and 11.89%were postnatal. The main sources of information for these women were the internet (47.7%) and television (16%) and radio (35%).

Table 1: Demographics

VARIABLES	FREQUENCY(n=454)	PERCENTAGE(%)
AGE		
18-25	186	40.96%
26-30	142	31.27%
31-35	102	22.46%
>36	24	5.28%
GRAVIDITY		
PRIMIGRAVIDA	182	40.08%
MULTIGRAVIDA	272	59.92%
TRIMESTER		
1ST	57	12.55%
2ND	163	35.9%
3RD	180	39.64%
POST PARTUM	54	11.89%
EMPLOYMENT		
WORKING	53	11.67%
HOME MAKERS	401	88.32%

Table 2: knowledge regarding covid infection and vaccination:

	YES n(%)	NO n(%)	DON'T KNOW n(%)
1. DO YOU THINK COVID IS A SERIOUS DISEASE?	454 (100%)	0	0
2. HAVE YOU HEARD ABOUT COVID-19 VACCINES?	454 (100%)	0	0
3. DO YOU THINK VACCINES ARE IMPORTANT TO PROTECT OTHERS IN THE COMMUNITY?	40(8.81%)	9(1.98%)	405(89.2%)
4. DO YOU THINK VACCINE WILL PROTECT YOU FROM THE DISEASE?	80(17.62%)	9(1.98%)	365 (80.39%)

5. ARE YOU WORRIED THAT VACCINES WILL CAUSE BIRTH DEFECTS OR LONG-TERM NEGATIVE EFFECTS TO THE NEONATE?	368 (81.05%)	5 (1.10%)	81 (17.84%)
6. DO YOU BELIEVE VACCINES ARE SAFE IN PREGNANCY?	33 (7.26%)	12 (2.64%)	409 (90.08%)
7. DO VACCINES HAVE SIDE EFFECTS?	183 (40.3050	89 (19.60%)	182 (40.08%)
8. ARE THE INGREDIENTS IN THE VACCINE HARMFUL?	6 (1.32%)	412 (90.74%)	36 (7.92%)
9. DO YOU THINK VACCINES ARE NOT REQUIRED TO PREVENT SPREAD OF DISEASE?	4 (0.88%)	72 (15.85%)	378 (83.25%)
10. DO YOU THINK VACCINES WILL HARM YOU?	13 (2.86%)	54 (11.89%)	387 (85.24%)
11. DO YOU THINK VACCINES CAN CAUSE COVID INFECTION?	397 (87.45%)	45 (9.91%)	3 (0.66%)
12. ARE YOU AFRAID OF INJECTIONS?	2 (0.44%)	452 (99.55%)	0
13. DO YOU THINK THERE IS LACK OF DATA REGARDING SAFETY OF COVID VACCINE IN PREGNANCY?	421 (92.73%)	11 (2.42%)	22 4.845)
14. DO YOU THINK THE VACCINE WILL NOT WORK?	8 (1.76%)	56 (12.33%0	390 (85.9%)
15. DO YOUR FAMILY MEMBERS HAVE HESITANCY TOWARDS VACCINATION?	375 (82.6%)	79 (17.4%)	0

Out of the 454 women, all knew about the availability of a vaccine against COVID-19. However, 80.93% were unsure about the beneficial effects of the vaccine in protecting them from the disease.

The most common reasons for refusing the vaccine were concerns from family members (n=375, 82.6%), concerns regarding their own safety, with 87% believing the vaccine might cause the infectionor safety concerns to the foetus (n=368, 81.05 %). Only 17.62% of subjects believed in the efficacy of the vaccine.

Table 3: Responses of the women to questions on attitude towards vaccination:

	YES	NO	MAYBE/DON'T KNOW
1. Have you received the tetanus vaccine in pregnancy?	454	0	0
2. Do you plan to vaccinate/immunize your baby after birth?	454	0	0
3. Have you been recommended the Covid vaccine by a healthcare worker?	378 (83.26%)	76 (16.74%)	0
4. In your opinion, would you continue to need to use safety precautions even after vaccination?	421 (92.73%)	19 (4.18%)	14 (3.08%)

All women had taken the tetanus vaccine which is recommended in pregnancy. However, only 23.79%(108) women had taken a single dose of the COVID vaccine prior to pregnancy. Meanwhile, 76.21%(346) had not taken any dose prior to this survey.

DISCUSSION

A good number of studies have been conducted on the KAP regarding vaccine acceptance in the general population. However, very few studies have been carried out specifically in pregnant and postpartum women. In our study, a majority of women knew about the existence of the COVID-19 vaccine and about its efficacy. This is contrary to a study done in seven low- and middle-income countries including India [24], which reported low awareness about the safety and efficacy of the vaccine. In their study, 29.2% of pregnant women considered the COVID-19 vaccine to be very effective in preventing COVID-19 infection and 21.7% thought that the vaccine was somewhat effective in infection prevention. The belief in COVID-19 vaccine effectiveness varied over the 7 countries with 6.9% Bangladeshi women believing in its effectiveness to 48.1% and 48.8 % women in Zambia and India, respectively, believing in its effectiveness. Collectively, over one-third (36.6%) has no awareness about the effectiveness of the vaccine in preventing COVID-19 infection. Those study participants in our study who had taken 1 dose prior to pregnancy were reluctant to complete the dosing schedule due to apprehensions regarding safety in pregnancy. The reasons for refusal to take the vaccine included 397 (87.45%)women assuming that there were chances of acquiring the infection through vaccine , 368 (81.05%)women fearful of possible harmful effects of the vaccine on the fetus or familial hesitancy in 375 (82.6%) women . Our results were similar to those found in the observational trial done over 7 countries [24] where 22.8% of women perceived that the vaccine was safe in pregnancy. The safety concerns varied over countries with 6.4% of the women in Bangladesh believing that it was safe to be vaccinated during pregnancy as against 35% among those women in Zambia and India. In a study done in Turkey [20] the main reasons for low acceptance among pregnant women included insufficient safety data and fear of possible harmful effects on the fetus(58.3%). Interestingly, that despite all subjects (100%) believing that the COVID-19 is a serious disease, a considerable number were not willing to take the vaccine during pregnancy and preferred to wait until after delivery to complete the dosing schedule. In a similar study conducted in Maharashtra [25], India , 58% of pregnant women were willing to get vaccinated following government approval, while 26% were hesitant towards vaccination. Compared to pregnant women, lactating women were less hesitant to get vaccinated (22% vs 27%). Vaccine hesitancy was most observed in the third trimester of pregnancy (29.5%).Similar studies in Switzerland [26] showed that only 29.7% (153/515) of pregnant and 38.6% (400/1036) of breastfeeding women were willing to get vaccinated. In a study conducted in China [27] on the acceptance of COVID-19 vaccine among pregnant women a higher acceptance rate of 77.4% was noted. In Italy [28] , a positive attitude towards SARS-CoV-2 vaccination during pregnancy was noted in 136 (84.5%) women, while 25.5% considered the vaccine to be not useful. Furthermore, most women had received the tetanus toxoid or were willing to do so indicating that they were not hesitant to take other vaccines in pregnancy. This was also noted in the study done in Turkey [20] on COVID-19 vaccine acceptance in pregnant women.

Limitations:

Firstly , the study was conducted in a private medical college which despite being a tertiary referral care center does not cater to a significant number of patients belonging to the lower socio-economic status . Hence, the perceptions towards the vaccine and acceptance of the vaccine in pregnancy might not be representative of the entire region. Secondly, our study was conducted at a time when guidelines on the efficacy of vaccination in pregnancy were not available. As more data on the topic become available particularly studies on the long term effects of the vaccine or disease on the fetus or new born, willingness to get oneself vaccinated during pregnancy might evolve. Due to evolving evidence on this topic, the answers to the questionnaire might change with progressing

time.

Conclusions:

The benefits of the COVID-19 vaccine are clear and positive with no potential adverse effects demonstrated yet. Very few studies have been conducted on the attitudes towards COVID-19 vaccine in pregnancy particularly among the population of Southern India. Concerns regarding the vaccine safety are a major barrier to ensuring complete dosing among pregnant patients. Pregnant women demonstrated an inadequate knowledge regarding the impact of COVID-19 on pregnancy in our study. However positive attitude and practices on preventive measures were good. This highlights the need for ongoing and continued health education for pregnant women for COVID-19 to improve knowledge on a constant basis, particularly with respect to vaccination. Including pregnant women in clinical trials, providing access to vaccines, and ensuring information specific towards pregnancy and breastfeeding women, particularly among those of younger age with a lower socio-economic level or educationally deprived women, is important to protect them from COVID infection and other viral infection in the future, while promoting herd immunity. Research on vaccination in pregnancy can be advanced through simulation studies, animal models, pharmacovigilance data, and other non-invasive evidence-generation methods. Identifying attitudes among priority groups is essential to create vaccination strategies in the prevention and control of COVID-19 and in avoiding another pandemic.

REFERENCES

1. Phoswa W.N., Khaliq O.P. Is pregnancy a risk factor of COVID-19? Eur. J. Obstet. Gynecol. Reprod. Biol. 2020;252:605. doi: 10.1016/j.ejogrb.2020.06.058.
2. Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to person transmission: A study of a family cluster. Lancet. 2020;395 (10223):514-23
3. Celewicz A., Celewicz M., Michalczyk M., Woźniakowska-Gondek P., Krejczy K., Misiek M., Rzepka R. Pregnancy as a Risk Factor of Severe COVID-19. J. Clin. Med. 2021;10:5458.
4. Allotey J., Fernandez S., Bonet M., Stallings E., Yap M., Kew T., Zhou D., Coomar D., Sheikh J., Lawson H., et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: Living systematic review and meta-analysis. BMJ. 2020;370:m3320.
5. Luppi P. How immune mechanisms are affected by pregnancy. Vaccine. 2003;21:3352–3357.
6. Buckley S.J. Executive Summary of Hormonal Physiology of Childbearing: Evidence and Implications for Women, Babies, and Maternity Care. J. Perinat. Educ. 2015;24:145.
7. Blakeway H., Prasad S., Kalafat E., Heath P.T., Ladhani S.N., Le Doare K., Magee L.A., O'Brien P., Rezvani A., von Dadelszen P., et al. COVID-19 vaccination during pregnancy: Coverage and safety. Am. J. Obstet. Gynecol. 2021;226:236.e1–236.e14.
8. Adhikari E.H., Spong C.Y. COVID-19 Vaccination in Pregnant and Lactating Women. JAMA. 2021;325:1039.
9. Public Health England JCVI issues new advice on COVID-19 vaccination for pregnant women. gov.uk. 2021 https://www.gov.uk/government/news/jcvi-issues-new-advice-on-covid-19-vaccination-for-pregnant-women
10. World Health Organization COVID-19 Vaccines Advice. Available online: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines/advice
11. Government U. COVID-19 Vaccination: A Guide on Pregnancy and Breastfeeding—GOV.UK. Available online: https://www.gov.uk/government/publications/covid-19-vaccination-women-of-childbearing-age-currently-pregnant-planning-a-pregnancy-or-breastfeeding/covid-19-vaccination-a-guide-on-pregnancy-and-breastfeeding
12. Vaccination Considerations for People Who Are Pregnant or Breastfeeding. Available online: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/pregnancy.html
13. Martins I., Louwen F., Ayres-de-Campos D., Mahmood T. EBCOG position statement on COVID-19 vaccination for pregnant and breastfeeding women. Eur J Obstet Gynecol Reprod Biol. 2021;262:256–258.
14. Razzaghi H., Meghani M., Pingali C., et al. COVID-19 vaccination coverage among pregnant women during pregnancy - eight integrated health care organizations, United States, December 14, 2020-May 8, 2021. MMWR Morb Mortal Wkly Rep. 2021;70:895–899.
15. Cui Y., Binger K., Tsaih S., Palatnik A. Understanding COVID-19 vaccine hesitancy in pregnant patients. Am J Obstet Gynecol. 2021;226:S658.
16. Magnus M.C., Gjessing H.K., Eide H.N., Wilcox A.J., Fell D.B., Håberg S.E. COVID-19 Vaccination during Pregnancy and First-Trimester Miscarriage. N. Engl. J. Med. 2021;385:2008–2010.
17. Zauche L.H., Wallace B., Smoots A.N., Olson C.K., Oduyebo T., Kim S.Y., Petersen E.E., Ju J., Beauregard J., Wilcox A.J., et al. Receipt of mRNA COVID-19 Vaccines and Risk of Spontaneous Abortion. N. Engl. J. Med. 2021;385:1533–1535.
18. Shimabukuro T.T., Kim S.Y., Myers T.R., Moro P.L., Oduyebo T., Panagiotakopoulos L., Marquez P.L., Olson C.K., Liu R., Chang K.T., et al. Preliminary Findings of mRNA COVID-19 Vaccine Safety in Pregnant Persons. N. Engl. J. Med. 2021;384:2273–2282.
19. Skjefte M., Ngirbabul M., Akeju O., et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. Eur J Epidemiol. 2021;36:197–211
20. Goncu Ayhan S., Oluklu D., Atalay A., Menekse Beser D., Tanacan A., Moraloglu Tekin O., Sahin D. COVID-19 vaccine acceptance in pregnant women. Int. J. Gynaecol. Obstet. 2021;154:291–296.
21. Januszek S.M., Faryniak-Zuzak A., Barnaś E., Łoziński T., Góra T., Siwiec N., Szczerba P., Januszek R., Kluz T. The Approach of Pregnant Women to Vaccination Based on a COVID-19 Systematic Review. Medicina. 2021;57:977.
22. Sutton D., D'Alton M., Zhang Y., Kahe K., Cepin A., Goffman D., Staniczenko A., Yates H., Burgansky A., Coletta J., et al. COVID-19 vaccine acceptance among pregnant, breastfeeding, and nonpregnant reproductive-aged women. Am. J. Obstet. Gynecol. MFM. 2021;3:100403.
23. Mose A., Yeshaneh A. COVID-19 Vaccine Acceptance and Its Associated Factors Among Pregnant Women Attending Antenatal Care Clinic in Southwest Ethiopia: Institutional-Based Cross-Sectional Study. Int. J. Gen. Med. 2021;14:2385–2395.
24. Naqvi S, Saleem S, Naqvi F, Billah SM, Nielsen E, Fogleman E, et al. Knowledge, attitudes, and practices of pregnant women regarding COVID-19 vaccination in pregnancy in 7 low- and middle-income countries: An observational trial from the Global Network for Women and Children's Health Research. BJOG. 2022 Nov;129(12):2002-2009.
25. Kumar V, Patil Y, Jain R, Bhanushali N, Gaonkar K, Ciby J. COVID-19 vaccination acceptance and adherence among pregnant and lactating high-risk group individuals of Maharashtra State, India. J Educ Health Promot. 2023 Jan 31;12:36.
26. Stuckelberger, S.; Favre, G.; Ceulemans, M.; Nordeng, H.; Gerbier, E.; Lambelet, V.; Stojanov, M.; Winterfeld, U.; Baud, D.; Panchaud, A.; et al. SARS-CoV-2 Vaccine Willingness among Pregnant and Breastfeeding Women during the First Pandemic Wave: A Cross-Sectional Study in Switzerland. Viruses 2021, 13, 1199

27. Tao, L.; Wang, R.; Han, N.; Liu, J.; Yuan, C.; Deng, L.; Han, C.; Sun, F.; Liu, M.; Liu, J. Acceptance of a COVID-19 vaccine and associated factors among pregnant women in China: A multi-center cross-sectional study based on health belief model. Hum Vaccines Immunother. 2021, 1–10.

28. Mappa, I.; Luviso, M.; Distefano, F.A.; Carbone, L.; Maruotti, G.M.; Rizzo, G. Women perception of SARS-CoV-2 vaccination during pregnancy and subsequent maternal anxiety: A prospective observational study. J. Matern. Neonatal Med. 2021, 2021, 1–4.