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Original Research Article

Knowledge, Attitude and Practice towards COVID 19 Vaccination during Pregnancy

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Abstract

Objective: To determine knowledge, attitude and practice towards COVID-19 vaccination in pregnant women.

Methods: A questionnaire consisting 12 questions was completed for 600 pregnant women who were selected randomly in an OPD of tertiary health care center. Socio demographic characteristic, knowledge about vaccine, vaccine availability at free of cost, vaccine safety in pregnancy, vaccine acceptability, causes for refusal of vaccine and effect of counseling on vaccine acceptance were evaluated.

Results: Among 600 participants 271(45.16%) pregnant women were already immunized with COVID-19 vaccine at the time of study. 157(26.16%) pregnant women took vaccine after counseling while 172(28.66%) women out of 600 wished to take it after delivery. Main causes for lack of vaccine acceptance were- misinformation regarding its safety (25%), patient's belief that it's unsafe for fetus (28.83%) and unavailability of documents in 1%. Socio demographic characteristic were evaluated and compared in terms of knowledge of vaccine, free of cost vaccine availability, vaccine safety, practice in terms of vaccine acceptance, causes for non-acceptance of vaccine and counseling for vaccination safety and need in pregnancy.

Conclusion: This study showed that pregnant women had good knowledge about vaccine and availability of vaccine free of cost .A large number of women had doubt about the safety of vaccine during pregnancy. A good number of patients received vaccine after counseling which reflects need of proper counseling. In order to protect all pregnant women and their newborns, COVID-19 vaccination should be considered as a part of routine antenatal care.

Introduction

The corona virus (COVID-19) infection is an unique infectious disease caused by novel corona virus 2. The WHO announced it as a pandemic on 11th march, 2020 [1]. India registered the first case of COVID-19 on 30/1/2020. Face mask, hand washing, social distancing and isolation were effective in slowing down the spread of the virus. However, the primary tool for controlling the pandemic is vaccine.

Pregnancy does not increase susceptibility to SARS-CoV-2 infection but appears to worsen the clinical course of COVID-19 (severe disease, ICU admission and invasive ventilation) compared with non-pregnant females of the same age. Elderly Pregnant women with co morbidities are specifically at increased risk of complications. Pregnant women with COVID-19 have an increased risk of developing complications such as preterm birth, pre-eclampsia/eclampsia and LSCS. Neonatal and perinatal morbidity and mortality are also increased.

Government of India provided approval for the vaccination of pregnant women against COVID-19 on July 2, 2021 [2]

In India, the decision to opt-in for vaccination is left to the pregnant woman after informing her about the pros and cons of vaccination. [3]

Social distancing, face masks, and personal hygiene are the most effective precautions, but maintaining these actions is not practicable in the long term. As a result, herd immunity by vaccination becomes the most effective eradication method, as in other viral epidemic diseases in the past.

Pregnant women were not included in most of the COVID-19 vaccine clinical trials. The American College of Obstetrics and Gynaecologists and the Society of Maternal Fetal Medicine recommended the use of COVID-19 vaccine for pregnant women if they prefer to be vaccinated. The safety data of covid vaccine during pregnancy was initially not available. This confusion and incomplete knowledge about covid vaccine during pregnancy affected their attitude and interfered with their decision making about the use of the vaccine.

This study aims to access the knowledge, attitude and practice among pregnant women for Covid-19 vaccination.

Material and Methods:

This cross sectional descriptive study was conducted from 1/12/21 to 31/12/21 on pregnant women attending the antenatal clinic of the obstetrics and gynaecology department in a tertiary centre at Mahila Chikitsalaya, SMS medical college Jaipur.

The inclusion criteria- Pregnant women willing for voluntary participation.

A structured questionnaire was designed to include 12 questions divided into 4 parts. The first part comprised questions regarding personal demographic information such as age, literacy status, place of residence and socio economic status. The second part had three questions on the knowledge of participant about covid vaccination during pregnancy. The third part had a question on the attitude of the participant towards covid vaccination during pregnancy and the fourth part had four questions regarding the acceptance of covid vaccine by pregnant women .

The participants were interrogated and the answers were entered in the questionnaires. Demographic detail were entered in columns D1, 2, 3, 4.

The knowledge part of questionnaire had three questions (K 1, 2, 3) that were given options of yes/no. Attitude towards covid19 vaccine was measured by one question (A 1). The practice was accessed by four questions (P 1, 2, 3, 4), and the reason for not accepting the vaccine during pregnancy was also noted.

The Categorical variables were expressed as frequency and percentage and were analyzed using chi square test. A p-value ≤ 0.05 was taken as statistically significant. All statistical analysis was done using epi info version 7.2.1.0 statistical software.

Questionnaire

Questions		Answer
	Demographic profile	
D1	Age	In years
D2	Place of residence	Rural/Urban
D3	Literacy status	Literate/ill literate
D4	Socio economic status	Lower/Lower middle/Upper middle
	Knowledge	
K1	Have you heard about COVID-19 vaccine	Yes ( ), no ( )
K2	Do you know its safe in pregnancy	Yes ( ), no ( )
K3	Do you know COVID-19 vaccine is available free of cost	Yes ( ), no ( )
	Attitude	
A1	Do you agree that vaccine will protect you from infection and it's seriousness	Yes ( ), no ( )
	Practice	
P1	Are you immunized with COVID -19 vaccine	Yes ( ), no( )
P2	If no ,why- 1. misinformation regarding it's safety 2.I think it's unsafe for fetus 3. no documents	
P3	Taken vaccine after counseling	
P4	I will take it after my delivery	

Table 1: Socio demographic profile of study participants (n=600)

Socio demographic characteristic	Number (n) (600)	Percentage (%)
AGE		
20-24years	222	37%
25-29years	360	60%
>30years	18	3%
Geographical area		
Rural	240	40%
Urban	360	60%
Education		
Illiterate	360	60%
Literate	240	40%
Socioeconomic status		
Lower	162	27%
Lower middle	390	65%
Upper middle	48	8%

The questionnaire was completed for total 600 participants. The mean age of the study population was 27$\pm$5.60. 60% pregnant women were between 25-29 years. Most of the women were illiterate (60%), from urban area(60%)and belonged to lower middle socioeconomic group(65%).

Table 2: Correlation of demographic profile and knowledge based on univariate analysis

Socio demographic characteristic	Have you heard about COVID-19 vaccine?		Do you know it's safe in pregnancy?		COVID-19 vaccine is available at free of cost	
	YES N (%)	NO N (%)	YES N (%)	NO N (%)	YES N (%)	NO N (%)
AGE						
20-24 years (37%)	205 (92.34%)	17 (7.66%)	97 (43.69%)	125 (56.31%)	192 (86.49%)	30 (13.51%)
25-29 years (60%)	337 (93.61%)	23 (6.39%)	166 (46.11%)	194 (53.89%)	330 (91.67%)	30 (8.33%)
>30 years (3%)	17 (94.44%)	1 (5.56%)	8 (44.44%)	10 (55.56%)	17 (94.44%)	1 (5.56%)
X^2-value df p-value	$X^2 = 0.395$; df 2 p = 0.821		$X^2 = 0.328$; df 2 p = 0.849		$X^2 = 4.467$; df 2 p = 0.107	
Geographical area						
Rural (40%)	220 (91.67%)	20 (8.33%)	101 (42.08%)	139 (57.92%)	206 (85.83%)	34 (14.17%)
Urban (60%)	339 (94.17%)	21(5.83%)	170 (47.22%)	190 (52.78%)	333 (92.5%)	27 (7.5%)
X^2-value df p-value	$X^2 = 1.048$; df 1 p = 0.306		$X^2 = 1.335$; df 1 p = 0.248		$X^2 = 6.297$; df 2 **p = 0.012**	
Education						
Illiterate (60%)	323 (89.72%)	37 (10.28%)	136 (37.78%)	224 (62.22%)	315 (87.5%)	45 (12.5%)
Literate (40%)	236 (98.33%)	4 (1.67%)	135 (56.25%)	105 (43.75%)	224 (93.33%)	16 (6.67%)
X^2-value df p-value	$X^2 = 15.447$; df 1 **p <0.001**		$X^2 = 19.101$; df 1 **p <0.001**		$X^2 = 4.745$; df 1 **p = 0.029**	
Socioeconomic status						
Lower (27%)	149 (91.98%)	13 (8.02%)	70 (43.21%)	92 (56.79%)	142 (87.65%)	20 (12.35%)
Lower middle (65%)	364 (93.33%)	26 (6.67%)	176 (45.13%)	214 (54.87%)	352 (90.26%)	38 (10.79%)
Upper middle (8%)	46 (95.83%)	2 (4.17%)	25 (52.08%)	23 (47.92%)	45 (93.75%)	3 (6.25%)
X^2-value df p-value	$X^2 = 0.914$; df 2 p = 0.633		$X^2 = 1.178$; df 2 p = 0.555		$X^2 = 1.725$; df 2 p = 0.422	

Knowledge related to COVID 19 vaccine

Overall 559(93.16%), women knew about COVID 19 vaccine but only 271 (45.16%) women were aware of its safety in pregnancy. 539 (89.83%) women were aware about its availability free of cost.

A large percentage of Women belonging to urban area (94.17%), upper middle socioeconomic group (95.83%), and literate women (98.33%) were aware about COVID 19 vaccine. It was surprising to learn that 4 literate women were unaware about the COVID 19 vaccine.

92.5% Women belonging to urban area, 93.75% women from upper middle socioeconomic group and 93.33% literate women had the knowledge regarding it's availability free of cost. There was a significant (p = 0.012) difference in the knowledge regarding free availability of the vaccine among rural- urban population.

329 women out of 600(54.83%) did not know that COVID 19 vaccine is safe during pregnancy. Only 56.25% educated women, 47.22% women from urban areas and 52.08% pregnant women from upper middle economic class were aware of safety of COVID vaccine during pregnancy.

Literate women had significantly (p <0.001) higher overall knowledge on vaccination during pregnancy.

Table 3: Correlation of demographic profile and attitude based on univariate analysis

Socio demographic characteristic	Do you agree that vaccine will protect you from infection and it's seriousness		X^2-value df	P value
	YES (N,Row %)	NO (N,Row%)		
AGE 20-24years (37%) 25-29years (60%) >30years (3%)	97(43.69%) 166(46.11%) 8(44.44%)	125(56.31%) 194(53.89%) 10 (55.56%)	$X^2 = 0.328$; df 2	0.849
Geographical area Rural (40%) Urban (60%)	101(42.08%) 170(47.22%)	139(57.92%) 190(52.78%)	$X^2 = 1.335$; df 1	p = 0.248
Education Illiterate (60%) Literate (40%)	136(37.78%) 135(56.25%)	224(62.22%) 105(43.75%)	$X^2 = 19.101$; df 1	p <0.001
Socioeconomic status Lower (27%) Lowe middle (65%) Upper middle (8%)	70(43.21%) 176(45.13%) 25(52.08%)	92(56.79%) 214(54.87%) 23(47.92%)	$X^2 = 1.178$; df 2	0.555

Attitude related to COVID 19 vaccine

45.16% (271) pregnant women were aware that COVID19 vaccine could protect them from the disease and its severity during pregnancy. Literate women (56.25%) had significantly (p <0.001) good attitude score as compare to illiterate group(37.78%). Similarly urban group(47.22%) was associated with good attitude as compare to rural group(42.08%) and Upper middle class(52.08%) had better attitude as compare to lower socioeconomic group(43.21%).

Table 4: Correlation of demographic profile and practice based on univariate analysis

Socio demographic characteristic	Are you immunized with COVID -19 vaccine?	If not, why?			Taken vaccine after counseling	I will take it after my delivery
		Misinformation regarding its safety N (Row %)	I think it's unsafe for fetus. N (Row %)	No documents N (Row %)	N (Row %)	N (Row %)
Age 20-24years (37%) 25-29years (60%) >30years (3%)	97 (43.69%) 166 (46.11%) 8 (44.44%)	55 (24.77%) 90 (25%) 5 (27.78%)	68 (30.64%) 101 (28.05%) 4 (22.22%)	2 (0.9%) 3 (0.83%) 1 (5.56%)	56 (25.23%) 95 (26.39%) 6 (33.34%)	69 (31.08%) 99 (27.5%) 4 (22.22%)
X^2-value df p-value	X^2 =0.328 df 2 p = 0.849	X^2 =0.256 df 2 p = 0.880	X^2 =0.822 df 2 p = 0.663	X^2 =3.852 df 2 p = 0.146	X^2 =1.153 df 2 p = 0.562	X^2 =1.153 df 2 p = 0.562
Geographical area Rural (40%) Urban (60%)	101 (42.08%) 170 (47.22%)	60 (25%) 90 (25%)	78 (32.5%) 95 (26.39%)	1 (0.42%) 5 (1.39%)	56 (23.34%) 10 1(28.06%)	83 (34.58%) 89 (24.72%)
X^2-value df p-value	X^2 =1.335 df 1 p = 0.248	X^2 =0.415 df 2 p = 0.520	X^2 =0.971 df 2 p = 0.324	X^2 =0.745 df 2 p = 0.388	X^2 =4.826 df 2 p = 0.028	X^2 =4.826 df 2 p = 0.028
Education Illiterate (60%) Literate (40%)	136 (37.78%) 135 (56.25%)	109 (30.28%) 41 (17.08%)	110 (30.55%) 63 (26.25%)	5 (1.39%) 1 (0.42%)	81 (22.5%) 76 (31.67%)	143 (39.72%) 29 (12.08%)
X^2-value df p-value	X^2 =19.10 df 1 p <0.001	X^2 =2.290 df 2 p = 0.130	X^2=2.979 df 2 p = 0.084	X^2=5.221 df 2 p = 0.022	X^2 =36.16 df 2 p <0.001	X^2 =36.16 df 2 p <0.001
Socioeconomic status Lower (27%) Lower middle (65%) Upper middle (8%)	70 (43.21%) 176 (45.13%) 25 (52.08%)	40 (24.69%) 100 (25.64%) 10 (20.84%)	51 (31.48%) 109 (27.95%) 13 (27.08%)	1 (0.62%) 5 (1.28%) 0 (0%)	39 (24.07%) 102 (26.15%) 16 (33.34%)	53 (32.71%) 112 (28.72%) 7 (14.58%)
X^2-value df p-value	X^2=1.178 df 2 p = 0.555	X^2 =0.319 df 2 p = 0.853	X^2=0.676 df 2 p = 0.713	X^2=1.02 df 2 p = 0.600	X^2 =5.447 df 2 p = 0.066	X^2 =5.447 df 2 p = 0.066

Practice score related to COVID 19 vaccine

271(45.16%) pregnant women out of 600 women were already immunized with COVID 19 vaccine at the time of study. Out of 329 pregnant women who were not immunized 157 (47.72%) pregnant women took vaccine after counseling .Overall 428 (71.33%) pregnant women were vaccinated at the end of our study. Individual counseling of pregnant women could improve the practice score from 45.16% to 71.33%. Our best counseling efforts could not motivate 166(27.66%) pregnant women to take the vaccine during pregnancy but they agreed to take the vaccine after delivery. Also 6 women were denied vaccination as they could not produce any valid document. This group also agreed to apply for document and take the vaccine as soon as possible.

In rural group 42.08% were already immunized while 23.34% took vaccine after counseling and 34.58% wished to take it after delivery where as in urban group 47.22% were already immunized and 28.06% took the vaccine after counseling and 24.72% wished to take it after delivery.

From illiterate group only 37.78%were already immunized while 22.5% took vaccination after counseling and 39.72% wished to take it after delivery. While in literate group 56.25% were already vaccinated and 31.67% took the vaccine after counseling and 12.08% agreed to take it after delivery.

In lower socioeconomic group 43.21% were already immunized while in lower middle class and upper middle class 45.13%, 52.08% respectively were already immunized. In lower socioeconomic group 24.07% took vaccine after counseling while it was 26.15%, 33.34% in lower middle class and upper middle class respectively. In lower class, lower middle class and upper middle class 32.71%, 28.72%, 14.58% wished to take it after delivery.

Among the literate pregnant population (135) 56.25% women were already vaccinated and (76) 31.67% took the vaccine after counseling. Overall difference in practice (vaccine acceptance) among literate women (87.91%) as compared to ill literate women (60.27%) was statistically significant ($p < 0.001$) However the other demographic characteristics like age , geographical area of residence and socio economic status did not influence the practice score significantly.

Discussion

In India covid19 vaccination started on 16thJanuary2021 for frontline workers. Initially pregnant women were not in the beneficiary group as there was lack of data available on safety of vaccine during pregnancy. After 167 days on 2ndJuly 2021 pregnant women were included as high risk individuals for vaccination .Though the knowledge about vaccine during pregnancy is good but the attitude and practice is still poor.

The overall knowledge about covid19 vaccine was found in 93.16% pregnant women, while 89.83% women were aware of its availability free of cost. Only 45.16% women believe that covid vaccine is safe in pregnancy.

A study done in oman on 3000 randomly selected adults also showed that 88.4% had heard about vaccine although it was done on randomly selected adults not on pregnant women.[4]

Main causes for lack of vaccine acceptance in present study were-misinformation regarding its safety (25%) and women's belief that its unsafe for the fetus (28.83%).Unavailability of documents was a reason for not taking vaccine in a small group of women (1%). In the present study we found that 26.16% took vaccine after proper

counseling regarding its safety and benefits in pregnancy. This reflects a need of proper counseling of pregnant women.

The low acceptability of covid19 vaccine in pregnancy was also seen in other studies. A study reported from Saudi Arabia showed the acceptance of covid vaccine to be 42.9%. This study was done in pregnant and women planning to pregnant. [5]

A recent study conducted in the United States among a similar study population that explored COVID-19 vaccination acceptance among pregnant, non-pregnant and breastfeeding women reported that non-pregnant women were most likely to accept vaccination (76.2%), with breastfeeding women the second most likely to accept vaccination (55.2%) and pregnant women had the lowest rate of vaccine acceptance (44.3%). [6] Another study in the US conducted on 939 pregnant women reported that only 41% of the participants would get a vaccine, and 82.0% of the participants were concerned about vaccine safety for their pregnancy. [7]

Similar results were reported in a large study that included 16 countries across the world, with only 52.0% of pregnant women reporting that they will take the vaccine compared to 73.4% of non-pregnant women. [8]

One study done in Turkey in 2021 on 300 pregnant women reported a lower rate of COVID-19 vaccine acceptability, with only 37% stating that they intend to receive the vaccine if it were recommended for pregnant women. [9]

The present study showed that 45.16% of the study population was already immunized, while 26.16% took vaccine after counseling regarding its safety and efficacy in pregnancy. Total 71.32% pregnant women received covid vaccine. This study was done in a tertiary health care centre which is situated in an urban area, so it does not reflect the whole community.

India has a high maternal and neonatal mortality rate. Presently India is facing dual burden of high maternal mortality rate as well as high maternal mortality due to covid pandemic. In order to protect all pregnant women and their newborns, COVID-19 vaccination can be considered as a part of routine antenatal care as suggested by other studies also. [10,11]

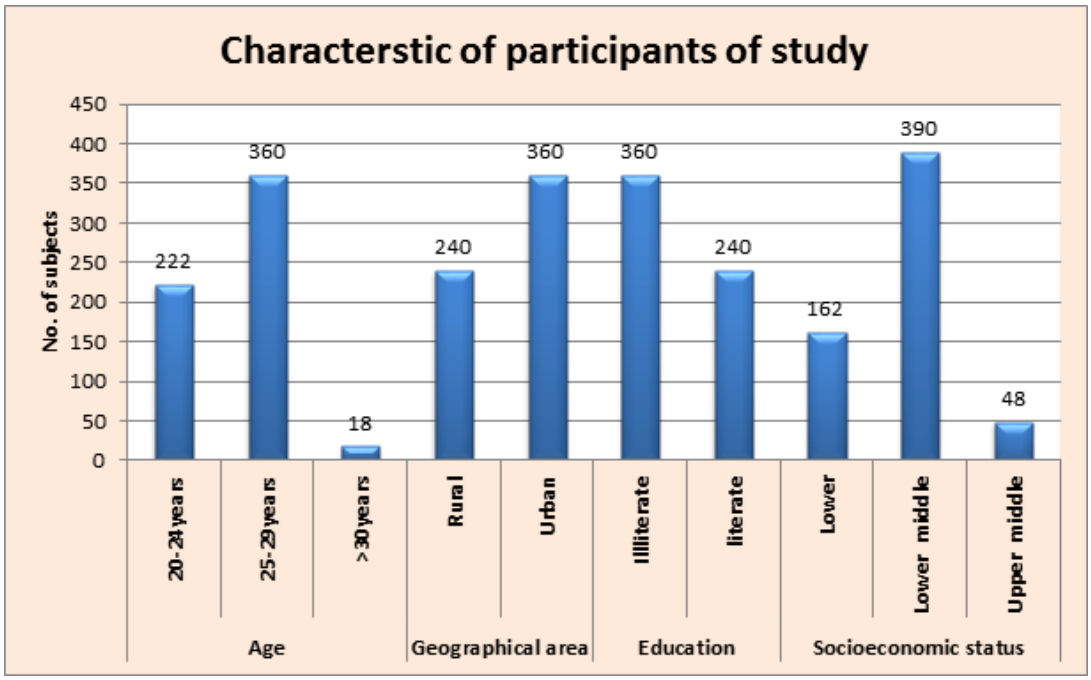
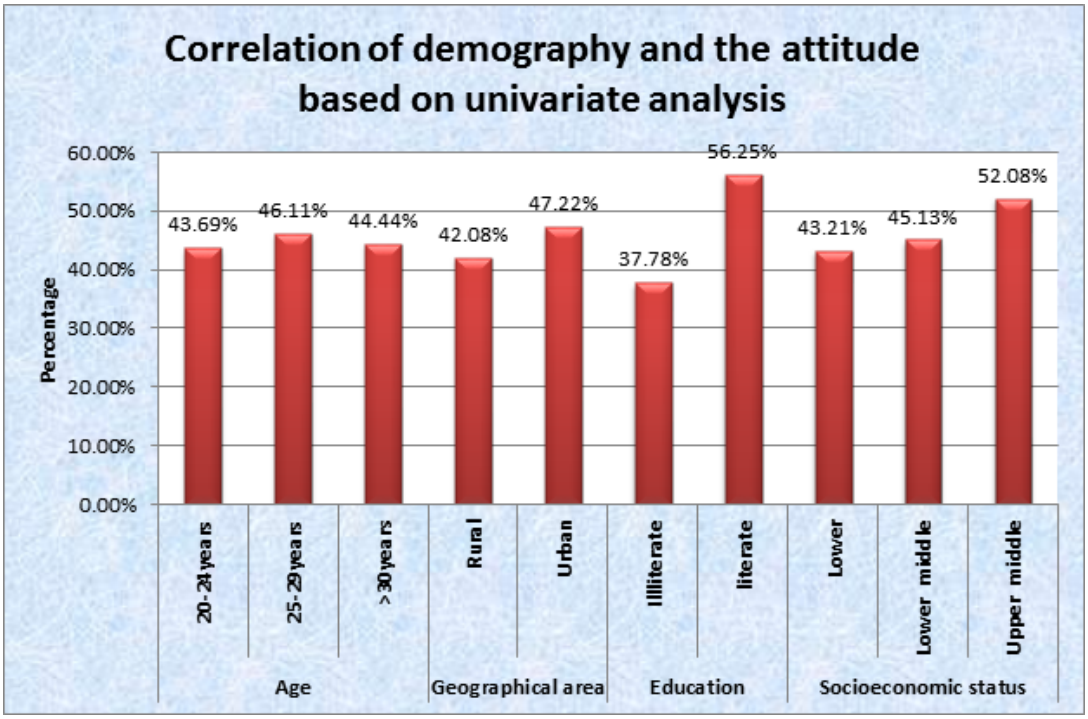
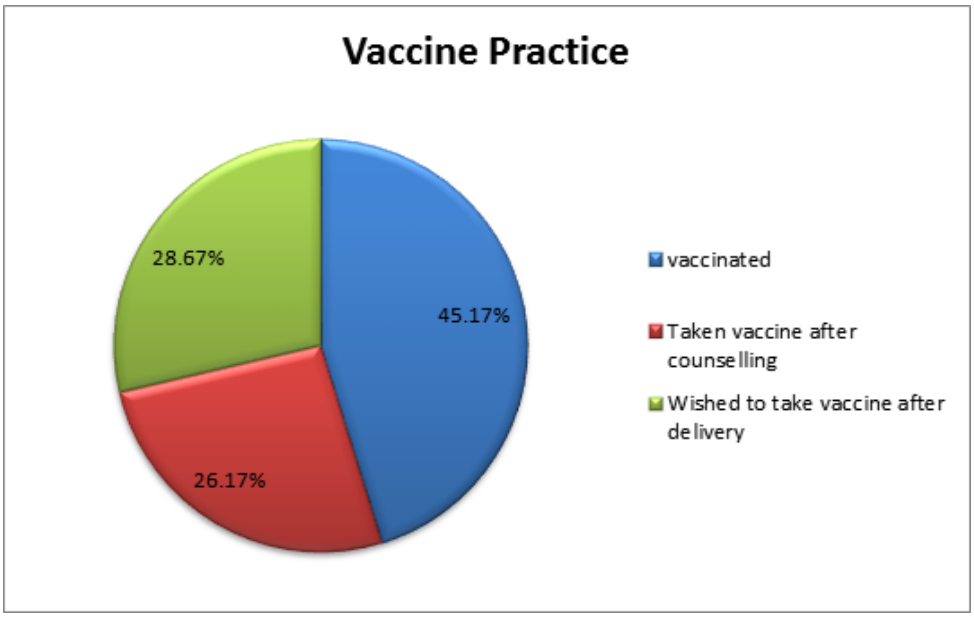
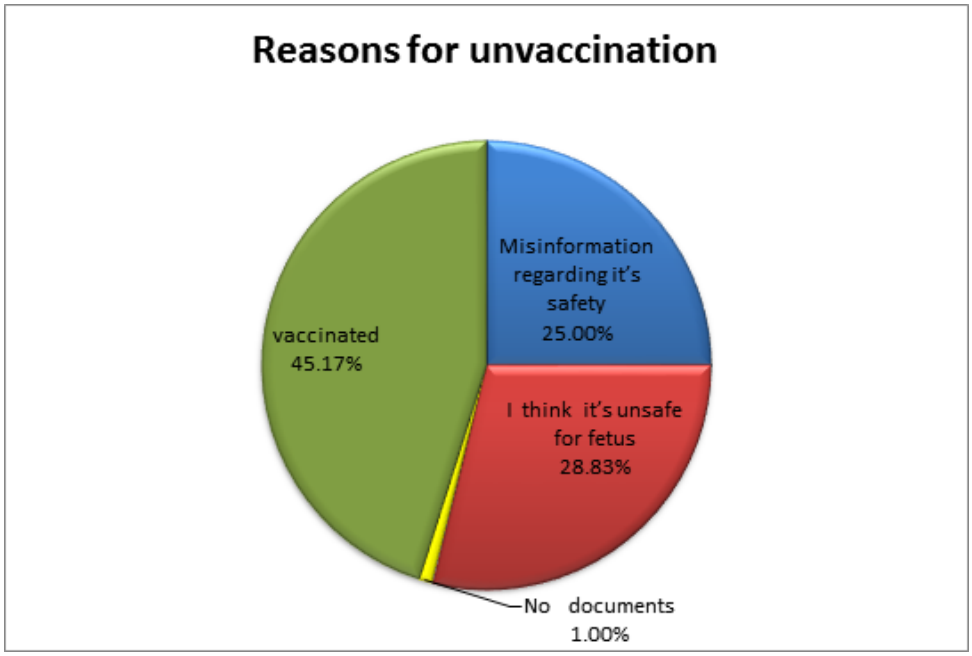


Chart illustrating positive attitude for- Do you agree that vaccine will protect you from infection and it's seriousness







Conclusion

This study showed that despite good knowledge about covid19 vaccine and its availability free of cost the attitude of pregnant women is not favorable as they believe that it is unsafe during pregnancy. A good number of pregnant women have themselves opted for the vaccine and a significant number has accepted the vaccine after proper counseling regarding the safety and benefits during pregnancy. This reflects need for proper counseling. Educational and public awareness campaigns should be intensified using various media platforms and through healthcare professionals for the general population. Specific efforts should be directed towards high-risk populations including pregnant women. This will enhance public trust in the vaccination and increase the acceptance. In order to protect all pregnant women and their newborns, COVID-19 vaccination can be considered as a part of routine antenatal care. A close vigilance on the adverse effects of COVID-19 vaccinations in pregnant women should be established to look for any adverse effects which are experienced by mothers and/or their newborns.

This is a small study at a tertiary care center. However, a similar larger study at community level is recommended.

Authors Contribution

All the authors contributed to the preparation of the final manuscript.

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