Original Article

Awareness and understanding of COVID-19 among pregnant woman in northern India

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Abstract:

BACKGROUND: The severe acute respiratory syndrome coronavirus (SARS-CoV-2) has become a public health concern worldwide. It is important for pregnant women to know about the mode of transmission, symptoms, and preventive measures against COVID-19. The aim of this study was to evaluate the awareness and outlook of pregnant women and practical measures taken by them against COVID-19.

MATERIALS AND METHODS: This cross-sectional questionnaire-based study was conducted for 1 month (June 10, 2020– July 10, 2020) in the Department of Obstetrics and Gynecology, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India. A prevalidated questionnaire was given to 109 pregnant women to assess the knowledge, attitude, and practice acquired against COVID-19 infection. The Chi-square test or Fischer's exact test was used to compare categorical data.

RESULTS: Among 109 participants, 103 (94.5%) had good knowledge, 4 (3.7%) had average knowledge and 2 (1.8%) had poor knowledge about COVID-19. Majority of them had a positive attitude for the protective measures taken for the prevention of disease.

CONCLUSIONS: Since there is no valid treatment for COVID-19, prevention is the only key to curve this infection. In the present study, 94.5% pregnant women had overall good knowledge score about the mode of transmission, symptoms, and preventive measures against COVID-19.

Keywords:

Awareness, COVID-19, pregnancy, preventive measures, severe acute respiratory syndrome coronavirus 2

Introduction

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In December 2019, there was an outbreak of respiratory disease of unknown cause in Wuhan, China. The causative agent of this severe acute respiratory syndrome is coronavirus. This acute respiratory syndrome is known as COVID-19, officially known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Coronaviruses belong to RNA viruses' family, the infections range from common cold to SARS. Most of the coronavirus infections are not life-threatening but some of them can lead to severe respiratory distress.

It was declared as pandemic by the World Health Organization (WHO) in march 2020, affecting 198 countries worldwide.[1] Health care workers are front-line warriors in fighting and protecting against COVID 19. As far as the origin is concerned, the COVID-19 (2019-nCoV/SARS-CoV-2) is believed to originate from bats.[2] In humans, it transmits through droplets and close contacts.[3] It is still in the phase of community spread that's why it is important to maintain good hygiene, follow social distancing.[4] It has been observed that COVID-19 infection has a negative impact on special population with age more than 60 years and pregnant women.

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The pregnancy in itself is an immune suppressive condition.[5]

Being pregnancy an immunocompromised condition, pregnant women are at high risk of various infections as compared to general population which can lead to morbidity and mortality. COVID-19 has an adverse effect on perinatal outcome in the form of miscarriage, preterm labor, and stillbirth. With this background, great effort should be made to protect pregnant mother and the fetuses from the infection of COVID 19. It can only be achieved by educating the pregnant women.

It is important to identify pregnant women's knowledge about causative agent, mode of transmission of disease, basic hygiene, preventive and protective measures such as using sanitizer, wearing mask in crowd, hand hygiene, and social distancing. So that, they can prevent the spread of COVID 19 and morbidity caused by it. However, the level of knowledge, practice acquired and the outlook of pregnant women against COVID-19 is yet to be evaluated. The present study aims to explore the awareness of pregnant women about COVID-19 infection and to evaluate the level of practice acquired by them to prevent COVID-19 infection.

Materials and Methods

Study design and settings
This cross-sectional questionnaire-based study was conducted in the Department of Obstetrics and Gynecology, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India. This study was conducted for 1 month from June 10, 2020, to July 10, 2020, after approval from Institutional Ethical Committee (IEC). The object and associated benefits of the study were explained to all the participants who consented for the study. The confidentiality of the responses given was maintained.

Study participants and sampling
The study population included total 109 pregnant women irrespective of the period of gestation attending the labor room and maternity ward and consenting to participate in the study. The sample size calculation was not required as it was a duration-based cross-sectional study.

Data collection tool and technique
For this study, a questionnaire was framed from the training material from the WHO website for the detection, prevention, response, and control of COVID-19.[6] The study questionnaire was divided into four parts:
A. Demographic details including name, age, address, socioeconomic status, marital status, education and occupation of couple, type of living place (congested or spacious), number of family members, and family income
B. Awareness about COVID-19 - Questions was framed to determine the knowledge of pregnant women about COVID 19 such as origin of COVID 19, mode of transmission, symptoms, harms in pregnancy, source of awareness, and protection from infection
C. Outlook towards COVID-19 - To find out the attitude of pregnant women about COVID 19, for example, willingness to use face masks, sanitizers, quarantine, and consistency in their behavior in following these precautions
D. Practice of preventive measures against COVID-19 - This part consisted of questions related to their practice of maintaining social distancing, avoiding going out of home, avoiding eating in restaurants, changing clothes, taking bath after coming from outside, maintaining basic hygiene, and taking ayurvedic medicines.

The questionnaire included thirty questions, ten each, for the three domains of awareness, outlook, and practice respectively. For the questions on awareness, each correct response was given a score of one. The expected total score was 21 as in a few questions more than one correct answer was also there. The final score of each patient was calculated and categorized as good knowledge (score 15–21), average knowledge (score 8–14) and poor knowledge (<7 score). This questionnaire was provided in Hindi as well as English language to all pregnant women who consented to participate.

To check the validity of the questionnaire, it was mailed to five experts, two in the field of obstetrics and gynecology and one each in surgery, community medicine and biostatistics and based on their suggestions, the modifications were made. The final modified version of the questionnaire was circulated to 15 pregnant women on day 1 of admission and again on day 2 of admission so as to check the reproducibility and internal consistency was checked using Cronbach's alpha which was 0.89. These 15 women were not included in the final analysis. This cross-sectional study was conducted after getting approval from IEC vide letter number AIIMS/IEC/2020-21/3033.

Data analysis
For statistical analysis, the data were tabulated into excel sheet and were analyzed by statistical package for social sciences software version 23.0. (Armonk, NY: IBM Corp, USA). Mean, range, and standard deviation (SD) was used to describe the continuous variables, and percentages were used to describe the categorical data. The Chi-square test or Fischer's exact test was used to compare categorical data.

Results

Demographic variables

A total of 109 pregnant women who attended the labor room and maternity ward, participated in this study. The mean age of participants was 25.82 ± 3.95 (years ± SD) with range from 20 years to 36 years. Most of the participants were in the age group of 20–25 years ($n = 60$; 55%) and 7.3% ($n = 8$) were more than 30 years old. Most of them were from urban areas ($n = 64$; 58.7%). Table 1 shows the demography of the study participants with its correlation with knowledge score.

Awareness in pregnant women about COVID 19

It was observed that 57.8% ($n = 63$) and 78.9% ($n = 86$) women were aware about the causative agent and the mode of transmission of COVID-19, respectively. According to 84.4% ($n = 92$) of participants, COVID-19 is a dangerous disease which can be fatal in pregnancy. Majority of the participants ($n = 106$; 97.2%) were knowing about the symptoms of COVID 19. About 97.2% ($n = 106$) of participants answered correctly about the protective measures against the infection. 72.5% ($n = 79$) women accepted to have downloaded Arogya Setu application (COVID 19 tracking application by the Government of India) in their mobile phones [Table 2].

The overall mean knowledge score of the participants was 18.0 ± 3.18 (mean ± SD). The overall knowledge score of the participants was good in 103 (94.5%), average in 4 (3.7%), and poor in only 2 (1.8%) participants [Figure 1].

Table 1: Demography of patients and its correlation with knowledge score

Variables	Frequency, n (%)	Knowledge		P
		Inadequate	Adequate	
Age (years)				
20-25	60 (55)	5	55	0.345
26-30	41 (37.6)	1	40	
More than 30	8 (7.3)	0	8	
Area of residence				
Urban	64 (58.7)	3	61	0.689
Rural	45 (41.3)	2	42	
Woman's occupation				
Home maker	103 (94.5)	6	97	1.00
Government employee	6 (5.5)	0	6	
Husband's occupation				
Government employee	29 (26.6)	1	26	1.00
Private job (business/farmer/labour)	80 (73.4)	5	77	
Socioeconomic status				0.406
Lower class	38 (34.86)	3	34	
Middle class	71 (65.14)	3	69	
Patients's education level				
Illiterate	6 (5.5)	4	53	0.681
Primary	21 (19.3)			
Secondary	30 (27.5)			
Total	57 (52.29)			
Graduation	16 (14.7)	2	50	
Postgraduation	36 (33)			
Total	52 (47.7)			
Husband's education level				
Illiterate	1 (0.9)	4	43	0.399
Primary	13 (11.9)			
Secondary	33 (30.3)			
Total	47 (43.12)			
Graduation	34 (31.2)	2	60	
Postgraduation	28 (25.7)			
Total	62 (56.88)			
Living place				
Flat	6 (5.5)	0	9	1.00
Independent house (house/villa/hut)	103 (94.5)	6	94	
Members in family				
<5	74 (67.9)	5	69	0.662
More than 5	35 (32.1)	1	34	

Outlook of pregnant women toward COVID-19

Although only 38.5% (*n* = 42) participants believed that COVID-19 is a curable disease but a much greater percentage of women (92.7%; *n* = 101) were positive in their belief that early detection can prevent the complications. Regarding travel restriction and continuation of lockdown, 69.7% (*n* = 76) and 71.6% (*n* = 78) respectively answered in favor. Majority (*n* = 100; 91.7%) of the participants believed that this infection could be more dangerous for the patients with medical disorders and comorbidities. Almost all (*n* = 102; 93.6%) believed that the use of face mask and sanitizers can limit the transmission of the infection and play an important role in protection [Table 3].

Practice of preventive measures against COVID-19

To assess the practice of following preventive measures, ten questions were asked. Only 67% (*n* = 73) pregnant women admitted that they are avoiding going out while 81.7% (*n* = 89) admitted to avoid consuming food from outside. Surprisingly, 46.8% (*n* = 51) pregnant women were consuming ayurvedic medicines to boost their immunity [Table 4].

The main source of information about COVID-19 was social media and newspaper for 31.2% (*n* = 34) and 29.4% (*n* = 32) participants, respectively.
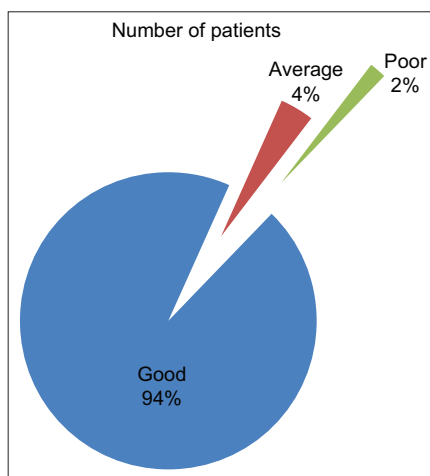

Figure 1: Knowledge score of the participants (*n* = 109)

Discussion

This study has given the overview of the level of knowledge, attitude, and practice (KAP) of preventive measures against COVID 19 in pregnant women attending the health care facility for antenatal care and delivery. Most of these questionnaire-based KAP studies have been conducted on health care workers or in the community in general. Our study is unique as it dealt with the patients directly and is not based on feedback on not on any mobile application. In India, COVID-19 has entered in the phase of community transmission and till date there have been more than 20 million positive cases. There are no proven treatment options for the disease. Pregnancy being an immunocompromised condition, any infectious disease can alter the pregnancy outcome. According to Irani *et al.*, the infection caused by coronavirus such as Middle East respiratory syndrome and severe acute respiratory syndrome in first trimester of pregnancy can result in adverse pregnancy outcomes such as miscarriage, congenital malformations, preterm labor, low birth weight, and stillbirth.[7]

Till recently, the health authorities were of the notion that the disease is not that fatal in pregnancy and has an overall good outcome. In fact, most of these women got hospitalized with COVID-19 infection only in the late second or third trimester.[8] However, the latest report by CDC (center of Disease control and prevention) and the American College of obstetrician and Gynaecologist on the fatality of COVID-19 in pregnancy, has really threatened the authorities. What exactly is true is yet to be explored.[9]

Being under lockdown in the middle of a global pandemic is in itself stressful and to that is the added burden of pregnancy. With the sudden emergence of this novel coronavirus and lack of valid information on its effect on pregnancy, pregnant women tend to be anxious and curious. In the present study, we collected the responses of 109 pregnant women to have an idea of their basic awareness and outlook. This was unfortunate that only 57.8% (*n* = 63) and 78.9% (*n* = 86)

Table 2: Awareness about COVID 19 among pregnant women (*n*=109)

Questions	Frequency of correct responses, *n* (%)
COVID 19 is originated from (bats)	63 (57.8)
COVID 19 is transmitted through (close contacts and droplets)	86 (78.9)
COVID 19 is fatal (yes)	93 (85.3)
Disease is more dangerous in pregnant women (no)	2 (1.8)
Are you aware of protective measures against COVID 19 (yes)	106 (97.2)
Did you downloaded Arogya setu app for knowledge of COVID 19 (yes)	79 (72.5)
Are you aware of symptoms of COVID 19 (yes)	106 (97.2)
What will you do if you are symptomatic (go to hospital)	86 (78.9)
Is COVID 19 treatable disease (yes)	60 (55)
There is a vaccine for COVID 19 (no)	94 (86.2)

Table 3: Outlook for COVID 19 among pregnant women (*n*=109)

	Agree, *n* (%)	Disagree, *n* (%)	No opinion, *n* (%)
Infection with COVID 19 results in death in all the patients	15 (13.8)	75 (68.8)	19 (17.4)
Timely detection and treatment improves the outcome	101 (92.7)	2 (1.8)	6 (5.5)
The COVID 19 is a curable disease	42 (38.5)	38 (34.9)	29 (26.6)
There should be restriction in travelling from one place to another	76 (69.7)	19 (17.4)	14 (12.8)
The lockdown should be continued for next one month also	78 (71.6)	14 (12.8)	17 (15.6)
Asymptomatic COVID positive pregnant females can go home quarantine	86 (78.9)	8 (7.3)	15 (13.8)
Patients with diabetes mellitus, cancer, respiratory disease should be more cautious	100 (91.7)	2 (1.8)	7 (6.4)
Wearing face mask and using sanitizers effectively prevent infection with COVID 19	102 (93.6)	2 (1.8)	5 (4.6)
The media is spreading the fear of COVID 19; "It's just a flu"	31 (28.4)	45 (41.3)	33 (30.3)
I usually follow the updates about the spread of COVID 19 in my country	100 (91.7)	3 (2.8)	6 (5.5)

Table 4: Frequency distribution of women's response on their practice towards novel coronavirus 2019 pandemic (*n*=109)

Practice statements	Yes, *n* (%)	No, *n* (%)	Sometimes, *n* (%)
I don't go out of my home in crowded or public places	73 (67)	13 (11.9)	23 (21.1)
I am avoiding consuming food from restaurants	89 (81.7)	7 (6.4)	13 (11.9)
I am avoiding shaking hands, hugging and partying with friends and maintain social distancing of 2 m	102 (93.6)	3 (2.8)	4 (3.7)
I am washing my hands and face frequently	95 (87.2)	5 (4.6)	9 (8.3)
I am using alcohol based sanitizers	81 (74.3)	17 (15.6)	11 (10.1)
I am using face masks in crowded areas or while going out	102 (93.6)	3 (2.8)	4 (3.7)
I take bath and change all my clothes after coming from outside	95 (87.2)	2 (1.8)	12 (11)
I am avoiding using cabs, buses, trains or other public transport	99 (90.8)	3 (2.8)	7 (6.4)
I am taking ayurvedic medicines to boost my immunity	51 (46.8)	36 (33)	22 (20.2)
I cover my face with handkerchief while sneezing and coughing (following respiratory hygiene)	101 (92.7)	1 (0.9)	7 (6.4)

participants were knowing about the causative agent and transmission of COVID 19 respectively. However, the overall level of knowledge about the COVID-19 infection and transmission was good in the majority of pregnant women (*n* = 103, 94.5%). Women from rural areas with low level of education had poor knowledge score (*n* = 2; 1.8%) and didn't know about the adequate preventive measures against COVID-19. It was observed that there was a correlation between demographic variables of participants with their knowledge score but statistically it was not significant. Due to a lack of knowledge and awareness about COVID-19, these women tend to be at increased risk of getting infected and transmitting the infection.

In a study by Zhu *et al.*, out of ten patients, nine COVID-positive pregnant women developed clinical symptoms in different stages of pregnancy. All patients had fever and cough and one patient developed diarrhea.[10] In our study, 97.2% (*n* = 106) participants were aware about the clinical presentation of coronavirus infection.

In the present study, 84.4% (*n* = 92) respondents believed that COVID-19 is more dangerous and fatal in pregnancy. Currently, the effect of COVID 19 on pregnancy is not well described but it is known that there are immunological and physiological changes in pregnancy which makes pregnant women more

susceptible to viral infections including COVID 19. In the last trimester of the pregnancy, there is decrease in size of chest cavity leading to difficulty in breathing. This physiology can make the infection with COVID 19 more severe.[11] According to Hosseini *et al.*, the pregnant women with COVID 19 infection developed placental abruption, amniotic membrane rupture, intrauterine growth restriction, fetal distress, meconium stained liquor, and low APGAR score.[12]

As per our study, majority of the participants agreed on avoiding travelling (*n* = 76; 69.7%), continuation of lockdown (*n* = 78; 71.6%) and agreed on home quarantine (*n* = 86; 78.9%). Similar results have been also supported by Erfani A *et al.*[12] To some extent, it may be assumed that this acceptance by the participants can also be because of strict actions taken by the government to prevent the spread of infection.

When asked about their outlook in general, many pregnant women in our study conceded their fear of increased risk of exposure with coronavirus while traveling to the hospital or in the hospital. Due to this fear of getting infected with coronavirus, most of them avoided their visit to their doctors. Similar findings of the pregnant patients becoming more prone to stress, depression, preterm labor pains, low birth weight and low APGAR score in newborns have been documented by other authors also.[13,14]

According to the CDC, the virus causing COVID 19 is thought to spread mainly by close contact with infected people through respiratory droplets.[15] The Indian Council of Medical Research also suggests that the reproduction factor of SARS COV2 is 2.5. One person can infect 406 people in 30 days.[16] Therefore, the respiratory hygiene, facemask, social distancing, isolation, and quarantine are the tools to optimize the spread of the infection and eliminate the disease. In our study, only 67% (*n* = 73) pregnant women preferred not going out of home, 81.7% (*n* = 89) avoided consuming food from restaurants, 93.6% (*n* = 102) avoided physical contact and followed social distancing. With increasing awareness, these figures can be increased to 100%. By following these measures, it is believed that we can control the transmission of virus and reduce the infection load.

The main source of information in our study participants was social media and news channels. It indicates that COVID-19-related news posted online or circulating in social media had an important role in improving the knowledge of pregnant women. However, at the same time, getting information from social media can be dangerous as there is diversity of unauthenticated information which can be spread easily. Therefore, one should confirm the authenticity of the content given on social media.[17]

Limitations

This study was a single hospital-based study which was conducted among the pregnant women attending maternity ward. The duration of the study was only 1 month. Hence, the sample size was small. Despite these limitations, our study provides valuable information about awareness, outlook, and precautions taken by pregnant women during the peak of a period of COVID-19.

Conclusions

Since there is no valid treatment for COVID-19, prevention is the only key to curve this infection. In the present study, majority of pregnant women had overall good knowledge score about the mode of transmission, symptoms and preventive measures against COVID-19. The low level of education and rural residence could be significant factors associated with poor knowledge of pregnant women. It is important to educate the pregnant women about the mode of transmission and preventive measures against COVID-19.

Acknowledgment

Conflicts of interest

There are no conflicts of interest.

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