# Knowledge, Attitude and Practice towards the Corona Virus (COVID-19) Pandemic among the Pregnant Women

Supriya Rai<sup>1</sup>, Neetha Poonja<sup>2</sup>, Neetha Nandhan<sup>3</sup>, Sapna Chauhan<sup>4</sup>, Shruthi Alevoor<sup>5</sup>

<sup>1, 2, 3, 4, 5</sup> Department of Obstetrics and Gynaecology, K S Hegde Medical Academy, Mangaluru, Karnataka, India.

#### ABSTRACT

#### BACKGROUND

We intended to assess the knowledge, attitude and practice of preventive measures followed against Covid-19 infection among pregnant women attending the antenatal clinic at K S Hegde Medical Academy, Mangalore.

#### METHODS

This cross-sectional study was conducted among the pregnant women attending antenatal clinic at K S Hegde Medical Academy, Mangalore, from July  $1^{st}$  2020 to August  $31^{st}$  2020. A validated questionnaire was provided to the patient. It consisted of 2 parts, demographic data, and 25 questions regarding knowledge, attitude, and practices.

#### RESULTS

Among 202 participants the overall knowledge, attitude and practice scores were 90.64 %, 97.33 % and 98.8 % respectively.

#### CONCLUSIONS

Majority of pregnant women demonstrated good knowledge, positive attitude and good practice regarding Covid-19 pandemic.

#### **KEY WORDS**

Covid-19, Knowledge, Attitude, Practice, Pandemic, India

Corresponding Author: Dr. Neetha Poonja, Flat No. 403, Haribhakthi Apts, Pintos Lane, Mangalore - 575004, Karnataka, India. E-mail: neetpoonja@yahoo.co.in

DOI: 10.14260/jemds/2021/255

How to Cite This Article: Rai S, Poonja N, Nandhan N, et al. Knowledge, attitude and practice towards the corona virus (COVID - 19) pandemic among the pregnant women. J Evolution Med Dent Sci 2021; 10(17):1191-1196, DOI: 10.14260/jemds/2021/255

Submission 17-11-2020, Peer Review 24-02-2021, Acceptance 03-03-2021, Published 26-04-2021.

Copyright © 2021 Supriya Rai et al. This is an open access article distributed under Creative Commons Attribution License [Attribution 4.0 International (CC BY 4.0)]

#### BACKGROUND

The novel coronavirus disease 2019 (Covid-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was diagnosed from Wuhan, Hubei Province (Mainland China). In reciprocation to the outbreak in China, World Health Organization (WHO) declared it as a public health emergency of international concern and called global imperative efforts to prevent the escalation.<sup>1,2</sup> As on October 20<sup>th</sup> 2020 over 41.6 million and 1.1 million deaths have been reported globally.

SARS-CoV-2 is an enveloped RNA $\beta$  coronavirus with an outer fringe of envelope proteins resembling like crown. It has a phylogenetic genome similarity with highly pathogenic and transmissible well-known virus i.e. SARS-CoV-1 (2003) and MERS-CoV (2012).<sup>3, 4</sup> Studies suggest the basic reproduction number (R0) of SARS-CoV-2 to be around 2.2 or may be up to 6, making the virus propagate at a very high rate and proving to be very expeditious and erratic.<sup>5</sup> It is found to be a zoonotic pathogen that transmits through respiratory droplet, physical contact and orofecal route. It has an incubation period of 2 - 14 days but infected persons can transmit the virus via close contact and respiratory droplets perhaps even before they become symptomatic.<sup>6</sup>

The disease appears to be particularly morbid in certain populations that include those older than 60 years of age, association of comorbidities and immunocompromised patients.<sup>5, 7</sup> Pregnant women are also considered to be a highrisk group because of the immune suppression caused by pregnancy. The immunologic and physiologic changes of pregnancy might make the pregnant women at a higher risk of severe illness with Covid-19, compared with the general population. In Middle East respiratory syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS-CoV), the case fatality rate appeared higher in pregnant women.<sup>8</sup> currently, more than 100 million women are pregnant worldwide and have a risk of contracting Covid-19. As per the morbidity and mortality weekly report of US Department of Health and Human Services / Centres for Disease Control and Prevention, pregnancy is associated with increased risk for ICU admission and receipt of mechanical ventilation, but it is not associated with increased risk of mortality.9 Some of the additional precautions that the pregnant women can take include not skipping antenatal care appointments, limiting interactions with other people as much as possible, taking precautions to prevent getting Covid-19 when interacting with others such as wearing masks, having at least a 30-day supply of medicines and talking to their health care provider about how to stay healthy during the Covid-19 pandemic.9 To reduce Covid-19 associated illness, pregnant women should be aware of their potential risk of the severity and the effects of the infection on the mother and baby. Prevention of Covid-19 should be emphasized for pregnant women and potential barriers to adherence to these measures need to be addressed.10,1

The symptoms of Covid-19 infection are mainly cough, sore throat and fever. Fever and hypoxemia may increase the risks of preterm labour, premature rupture of membranes and abnormal foetal heart rate patterns.<sup>11</sup> The incidence of preterm deliveries also occur in patients without severe respiratory disease. Many of third-trimester cases are electively delivered by caesarean in intervene view of the bias

### **Original Research Article**

faced to catalyse by the belief that management of severe maternal respiratory disease would be improved by delivery. However, this hypothesis is unproven.<sup>12</sup> Hyperthermia which is common in Covid-19 is a concern as elevation of maternal core temperature from fever during organogenesis in the first trimester may be associated with an increased risk of congenital anomalies such as neural tube defects and miscarriage in first trimester.<sup>8</sup> An increased incidence of these outcomes has not been observed. Use of acetaminophen in pregnancy in the first trimester has been shown overall to be safe and may decrease the pregnancy risks associated with fever exposure.<sup>7, 13</sup>

Person to person transmission is currently ongoing in the country making it necessary to control the disease. To guarantee successful disease control people's adherence to preventive and control measures are essential. This is highly dependent on the population's knowledge, attitude and practice (KAP) towards Covid-19 following the KAP theory.<sup>5,14</sup> A previous study indicates that the knowledge level and attitude towards infectious diseases are associated with the level of panic among the population, which can further complicate attempt to prevent the spread of the disease.<sup>5</sup>

The purpose of the study was to evaluate the factors which influence the knowledge, attitudes and practices of pregnant women on preventive measures against Covid-19 and to also evaluate the association between the demographics and KAP of Covid-19.

#### METHODS

This was a cross-sectional survey conducted among pregnant women attending antenatal clinic at K S Hegde Medical Academy, Mangalore, after taking informed consent. The study was conducted for 2 months from July 1st 2020 to August 31st 2020. A validated questionnaire was used to collect the data. It consisted of demographic data and the questionnaire with questions regarding knowledge, attitude and practices. Information published in literature including publications available on WHO and the Centres for Disease Control and Prevention (CDC) were utilized at large. Participants with age more than 18 years who can understand the content of the survey and willing to participate were included. The questionnaire was prepared in English language and then translated to local language that was used for data collection. The questionnaire was then refined accordingly for final use.

The independent variables were demographic characteristics like age, address, education, occupation, gestational age, awareness about the pandemic and history of travel in the recent past, presence of co-morbid conditions like bronchial asthma, diabetes mellitus, hypertension, tuberculosis and cardiac diseases. The dependent variables were knowledge, attitude and practices towards prevention of Covid-19 infection. Questions on knowledge were about the spread of the virus, symptoms if contracted, visit to health care worker, safety of pregnancy during the pandemic and knowledge about the treatment. The questions on attitude were regarding social distancing, need for lockdown, changes in the diet, universal testing and anxiousness about getting infected by the virus.

## Original Research Article

18-22 years     60     30 %       28-32 years     61     30.7 %       28-32 years     61     30.7 %       38-42 years     61     95 %       38-42 years     61     2%       Marital status     Single     202     100 %       Geographical area     Mural     33     32.2 %       Education     Below scondary years     44     72.4 %       Senior scondary     144     72.4 %     65 %       Geographical area     Urban     35     32.2 %       Education     Senior scondary years     42     21.1 %       Senior scondary     144     72.4 %     65 %       Occupation     Silled     0     0       Occupation     Silled     22     11 %       Student     0     0     3%       Parity     G1     70     35.2 %       Geographical area     26 (% moral area     3%     5.0 %       Occupation     Geographical area     0     0       Occupation     Geogr			Number (N)	Percentage
Age     23 - 27 years     55     27.6 %       B2 - 32 years     61     30.7 %       33 - 37 years     19     95 %       33 - 37 years     0     95 %       Marital status     Married     2%       Marital status     Single     20     100 %       Geographical area     Rural     137     67.8 %       Education     Senior secondary school     42     21.1 %       Senior secondary school     42     21.1 %       Occupation     Graduate     13     65 %       Occupation     Senior secondary     144     72.4 %       Occupation     Skilled     0     0       Viskilled     0     0     0       Skilled     22     11.1 %     0       Unemployed     173     86     3%       Ga dabore     60     38.7 %     38.7 %       Ga dabore     0     38.7 %     38.7 %       Ga dabore     93     46.7 %     38.7 %       History of travel in the recent past	Age	18 - 22 years	60	30 %
Age   28 - 32 years   61   307 %     33 - 37 years   19   9,5 %     38 - 42 years   4   2%     Marited   2%   36     Marited status   Single   202   00 %     Geographical area   Rural   137   67.8 %     Urban   35   22.2 %   21.1 %     Education   Below secondary school   42   21.1 %     Fordaute   134   65.5 %   0     Occupation   Skilled   22   11.1 %     Marited   0   0   0     Occupation   Skilled   22   11.1 %     Viewenbyoed   13   65.5 %   0     Occupation   Skilled   22   11.1 %     Viewenbyoed   173   86   3%     Parity   G1   70   35.2 %   3%     Gestational age   Up to 14 weeks   74   35.2 %   3%     History of travel in the recent past   0   0   0   3%     Presence of co-morbid conditions (CDM Verkis to 40 weeks   6   3		23 - 27 years	55	27.6 %
33 - 37 years 19 9.5 %   Marital status Married 2%   Marital status Single 202   Geographical area Rural 137 67.8 %   Rural 137 67.8 % 32.2 %   Education Below secondary school 42 21.1 %   Education Senior secondary 144 72.4 %   Graduate 13 6.5 %   Occupation Unskilled 0 0   Voccupation Unskilled 0 0   Stident 22 11.1 % 0   Occupation Unskilled 0 0   Stident 22 11.1 % 0   Occupation Stident 22 11.1 %   Stident 22 11.1 % 0   Occupation Stident 22 11.1 %   Voccupation Stident 22 11.1 %   Voccupation Stident 22 11.1 %   Voccupation Stident 22 26.1 %   Stident to 22 12.1 % 35.5 % 36.5 %   Parity G1 70 35.2 %   G2 52 26.1 % 37.2 %   History of rave		28 - 32 years	61	30.7 %
33 + 42 years   4 $2%$ Marriel   Marriel   202   100 %     Marriel   Single   202   100 %     Geographical area   Rural   137   67.8 %     Education   Below secondary school   42   21.1 %     Feducation   Below secondary school   42   21.1 %     Graduate   144   72.4 %   67.8 %     Graduate and above   0   0   0     Occupation   Usskilled   0   0   0     Merried   22   11.1 %   0   0     Occupation   Usskilled   0   0   0   0     Merried   173   86   59 %   9%   96		33 - 37 years	19	9.5 %
Marital statusMarried Single Others100 %Geographical areaRural Urban137 3567.8 % 32.2 %EducationBelow secondary school Senior secondary Graduate Post-graduate and above42 13 1621.1 % 165.8 % 00EducationVision22 Stilled Stilled Self employed 3 1600OccupationUnscilled Skilled Self employed 3 160 3 <b< td=""><td></td><td>38 - 42 years</td><td>4</td><td>2 %</td></b<>		38 - 42 years	4	2 %
NumberSingle Others202 Others100 %Geographical areaRural Urban137 3567.8 % 32.2 %EducationBelow secondary school Serior secondary Graduate Post-graduate and above42 1321.1 % 72.4 % 0EducationBelow secondary school Graduate Post-graduate and above42 1321.1 % 72.4 % 0OccupationBelow secondary school Graduate Post-graduate and above00OccupationUskilled Skilled Numenployed 1730 86 5.9 % 3%0ParityG1 G2 G3 and above70 22 14 to 20 weeks 3 %35.2 % 26.1 % 38.7 %Gestational ageUp to 14 weeks 14 to 20 weeks 37 weeks to 40 weeks 37 weeks to 40 weeks 6 674 33 3%37.2 % 36.1 31.8 % 38.7 %History of travel in the recent past0 No172 172 18.5 13.1 % 37 weeks to 40 weeks 37 weeks 37 weeks 37 w	Marital status	Married		
Others     0     000000000000000000000000000000000000		Single	202	100 %
Geographical areaRural Urban137 3567.8 % 32.2 %EducationBelow secondary school Senor scoodary Graduate Post-graduate and above42 42 414 413 65 %21.1 % 72.4 % 65 %OccupationDiskilled Unskilled Self employed 3 Professional 400ParityG1 62 62 and above0ParityG1 62 62 and above352 % 62 63 and aboveParityG1 62 62 and above70 62 52 63 and above352 % 62 62 63 and abovePersence of co-morbid conditions (GDM < bronchial statma, allergies, hypertension, tuberculosis)Yes No17 182 17 18285 74 74 74 74 76 <td></td> <td>Others</td> <td>0</td> <td>20070</td>		Others	0	20070
Urban     13/ 35     07.8 m 22.2 m       Education     Below secondary school Senior secondary     42 144     72.4 m 72.4 m 66.5 m       Education     Sinior secondary     144 72.4 m 66.5 m     72.4 m 65.5 m       Occupation     Skilled     0     0       Skilled     22     11.1 m 0     0       Occupation     Skilled     22     11.1 m 0       Vinemployed     0     0     0       Parity     G1     70     35       Parity     G2     70     35.9 m       Gestational age     14 to 28 weeks     74     36       28 weeks to 37 weeks     26     31 m     36       28 weeks to 37 weeks     6     3 m     36       Presence of co-morbid conditions (CDM < bronchial asthma, allergies, hypertension, tuberculosis)     Yes     17 182     85 18.6     36       Latest information about Covid-19 pandemic     Yes K irends     37 18.6     37 18.6     38		Rural	107	(= 0.0)
Image: constraint of the secondary school Senior secondary Graduate Post-graduate and above42 42 (21.1 % 72.4 % 65 % 0EducationSenior secondary Graduate Post-graduate and above42 11 13 0 021.1 % 72.4 % 65 % 0OccupationUnskilled Skilled Skilled Unemployed Self-employed 3 86 Self-employed 33 700ParityG1 G2 G2 G3 and above70 32 52 26.1 % 33 66 36ParityG1 G2 G3 and above70 33 36 36 38.7 %Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 38 weeks to 37 weeks 38 weeks to 37 weeks 39 28 weeks to 37 weeks 39 39 16270 39.6 	Geographical area	Urban	137	67.8%
EducationBelow secondary school Graduate Post-graduate and above4221.1 % 72.4 % 6.5 % 0OccupationUnskilled Skilled Unemployed Unemployed Self employed 300ParityG1 G2 G3 and above03ParityG1 G2 G3 and above35.9 % 3G1 G2 G3 and above035.9 % 3ParityG1 G2 G3 and above7.2 % 33.6 % 3.6 %ParityG1 G2 G3 and above7.2 % 3.6 % 3.6 %3.6 % 3.6 %ParityG1 G2 G3 and above 3.7 %7.2 % 3.6 % 3.6 %ParityG1 G2 G3 and above7.2 % 3.6 %ParityUp to 14 weeks 3.7 weeks to 3.7 weeks 3.7 %7.2 % 3.6 %ParityVip to 14 weeks 3.7 %			35	32.2 %
Education Senior secondary Graduate 144 13 13 65 % 0 72.4 % 65.8 0   Post-graduate and above 0 0   Occupation Unskilled Skilled 22 11.1 % 0 0   Occupation Skilled 22 11.1 % 0 0   Occupation Skilled 22 11.1 % 0 0   Parity Graduate 0   Farity Graduate 70 Graduate 3%   Parity Graduate 70 Graduate 35.2 % 26.1 % 36   Gestational age Up to 14 weeks 14 to 28 weeks 74 80 37.2 % 36   History of travel in the recent past 0 0   Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis) Yes No 17 182 85 91.5   Latest information about Covid-19 pandemic Yes Newspaper Relatives & friends 144 186 186 72.4 186   Electronic visual media Newspaper Relatives & friends 144 186 72.4 186		Below secondary school	42	21 1 0%
Graduate   14   0     Post-graduate and above   0   0     Occupation   Unskilled   0   0     Occupation   Unskilled   0   0     Occupation   Unskilled   0   0     Student   0   0   0     Unemployed   173   86     Self employed   3   5.9 %     Professional   3   3.%     Parity   G1   70   35.2 %     G3 and above   80   38.7 %     Gestational age   Up to 14 weeks   74   37.2 %     14 to 28 weeks   93   46.7 %   35.9 %     15 28 weeks to 37 weeks   93   46.7 %   35.9 %     16 History of travel in the recent past   0   0   0     Presence of co-morbid conditions (GDM < bronchial ashtma, allergies, hypertension, tuberculosis)	Education	Senior secondary	42	72 4 %
Post-graduate and above00Post-graduate and above00000Skilled2211.1 %00010001000100010001000100011.1 %001000100011.1 %001000101738620217035.2 %21627035.2 %2226.1 %8038.7 %1114 to 28 weeks7437.2 %1114 to 28 weeks7437.2 %14 to 28 weeks to 37 weeks2613.1 %28 weeks to 37 weeks2613.1 %37 weeks to 40 weeks63 %1114072.4128.5151214014472.41318.69141518.615189		Graduate	13	65%
Unskilled Skilled00OccupationSkilled Skilled2211.1 %Occupation000Unemployed Volemployed17.386Self employed Professional35.9 %ParityG1 G270 S252.2 %G3 and above8038.7 %Gestational ageUp to 14 weeks 28 weeks to 37 weeks 37 weeks to 40 weeks74 93 2637.2 % 46.7 % 38.Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No No No 18217 182 37 1828.5 91.5Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends 37144 37 186 37 37 186 3772.4 18.6 91.5		Post-graduate and above	0	0.5 %
$\begin{tabular}{ c c c c } & Unskilled & 0 & 0 & 0 \\ Skilled & 22 & 11.1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & $			Ū	C C
Skilled   22   11.1%     Occupation   Student   0   0     Unemployed   173   86     Self employed   33   5.9%     Professional   4   3%     Parity   G1   70   35.2%     G2   72   26.1%     G3 and above   80   38.7%     Marcine Sectional age   Up to 14 weeks   74   37.2%     Up to 14 weeks   74   37.2%   46.7%     28 weeks to 37 weeks   26   13.1%   37.2%     History of travel in the recent past   0   0   0     Presence of co-morbid conditions (GDM < bronchial age		Unskilled	0	0
Occupation     Student     0     0       Unemployed     173     86       Self employed     3     5.9 %       Professional     4     3%       Parity     G1     70     35.2 %       G2 and above     80     38.7 %       Gestational age     Up to 14 weeks     74     37.2 %       Meeks to 40 weeks     93     46.7 %     38.7 %       Gestational age     Up to 14 weeks     74     37.2 %       History of travel in the recent past     0     0     0       Presence of co-morbid conditions (GDM < bronchial ather weeks to 40 weeks to 40 weeks to 6		Skilled	22	11.1 %
Unemployed17386Self employed35.9 %Professional43 %ParityG1 G270 5235.2 %G3 and above5038.7 %Gestational ageUp to 14 weeks 14 to 28 weeks74 93 28 weeks to 37 weeks37.2 %Gestational ageUp to 14 weeks 14 to 28 weeks74 	Occupation	Student	0	0
Self employed35.9 %Professional43 %ParityG1 G270 5235.2 % 26.1 % 38.7 %Ga and above8038.7 %Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 28 weeks to 37 weeks 674 26 26 3 %37.2 % 36.6 % 36.6 %History of travel in the recent past03Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 182Latest information about Covid-19 pandemicYes Newspaper Relatives & friends72.4 37 186 9Table 1. Social Demographics		Unemployed	173	86
Professional43 %ParityG1 G270 52 26.1 % 38.7 %35.2 % 26.1 % 38.7 %Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 28 weeks to 37 weeks 37 weeks to 40 weeks 637.2 % 46.7 % 26 3 %History of travel in the recent past00Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 182Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends144 37 18272.4 186 9Table 1. Social Demographics		Self employed	3	5.9 %
Parity $G_1^{0}$ $G_2^{0}$ $G_3$ and above70 $52$ $63$ and above35.2 % $26.1 %$ $38.7 %$ Gestational ageUp to 14 weeks $14 to 28 weeks$ $80$ 74 $93$ $26 weeks to 37 weeks2626 weeks to 37 weeks37 weeks to 40 weeks37 weeks to 40 weeks37 weeks to 40 weeks7437.2 %46.7 \%13.1 %3\%History of travel in the recent past03%Presence of co-morbid conditions (GDM < bronchialasthma, allergies, hypertension, tuberculosis)YesNo17182Presence of co-morbid conditions (GDM < bronchialNoYesNo17182Latest information about Covid-19 pandemicElectronic visual mediaNewspaperRelatives & friends1443737182Latest information about Covid-19 pandemicElectronic visual mediaNewspaperRelatives & friends144373718Table 1. Social Demographics9$		Professional	4	3 %
Parity   G2   70   35.2 %     G3 and above   52   26.1 %     80   38.7 %     Gestational age   Up to 14 weeks   74   37.2 %     14 to 28 weeks   93   46.7 %   33.4 %     28 weeks to 37 weeks   93   46.7 %   33.9 %     7 History of travel in the recent past   0   38.7 %   37.2 %     Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)   Yes   17   8.5   91.5     Latest information about Covid-19 pandemic   Electronic visual media Newspaper Relatives & friends   144   72.4   18.6   9     Table 1. Social Demographics   144   9		61		
Classical52261 %G3 and above8038.7 %Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 37 weeks to 40 weeks 69337.2 %History of travel in the recent past03738.5Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 1828.5 191.5Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends144 17 18272.4 186 9Table 1. Social Demographics	Parity	62	70	35.2 %
So and above8038.7 %Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 37 weeks to 40 weeks 37 weeks to 40 weeks7437.2 %History of travel in the recent past2613.1 %Presence of co-morbid conditions (CDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 182Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends144 17 182Table 1. Social Demographics72.4 182		C3 and above	52	26.1 %
Gestational ageUp to 14 weeks 14 to 28 weeks 28 weeks to 37 weeks 37 weeks 37 weeks to 40 weeks 637.2 % 39337.2 % 46.7 % 13.1 % 38 %History of travel in the recent past037.2 %37.2 %Presence of co-morbid conditions (CDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 1828.5 91.5Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends144 17 18272.4 18.6 9Table 1. Social Demographics		d3 and above	80	38.7 %
Gestational age14 to 28 weeks 28 weeks to 37 weeks 37 weeks 37 weeks to 40 weeks7437.2 %History of travel in the recent past28 weeks to 37 weeks 37 weeks to 40 weeks9346.7 %Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 1828.5 91.5Latest information about Covid-19 pandemicElectronic visual media Newspaper Relatives & friends14472.4 186 9Table 1. Social Demographics		Up to 14 weeks		
28 weeks to 37 weeks 37 weeks to 40 weeks9346.7 % 13.1 %37 weeks to 40 weeks2613.1 %37 weeks to 40 weeks63 %600Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)Yes No17 182Latest information about Covid-19 pandemicElectronic visual media Newspaper144 37 18272.4 186 9Latest information about Covid-19 pandemicElectronic visual media Newspaper 1829Table 1. Social Demographics	Gestational age	14 to 28 weeks	74	37.2 %
37 weeks to 40 weeks 26 13.1 %   37 weeks to 40 weeks 6 3%   6 0 0   91 0 0   Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)		28 weeks to 37 weeks	93	46.7 %
History of travel in the recent past 6 3%   Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)		37 weeks to 40 weeks	26	13.1 %
Instory of trave in the recent past 0   Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis)	III's to see a Channel in the second sector		6	3%
Presence of co-morbid conditions (GDM < bronchial asthma, allergies, hypertension, tuberculosis) Yes 17 8.5   No 182 91.5   Latest information about Covid-19 pandemic Electronic visual media Newspaper 72.4   Newspaper 37 18.6   Relatives & friends 18 9	History of travel in the recent past		0	U
asthma, allergies, hypertension, tuberculosis) No 17 0.3   Latest information about Covid-19 pandemic Electronic visual media 91.5   Newspaper 144 72.4   Newspaper 37 18.6   Relatives & friends 18 9	Presence of co-morbid conditions (GDM < bronchial	Yes	17	0 F
Latest information about Covid-19 pandemic Electronic visual media Newspaper 144 72.4   Relatives & friends 37 18.6   Table 1. Social Demographics 9	asthma, allergies, hypertension, tuberculosis)	No	1/	0.5
Latest information about Covid-19 pandemic Electronic visual media 144 72.4   Newspaper 37 18.6   Relatives & friends 18 9			102	71.5
Newspaper 37 18.6   Relatives & friends 18 9   Table 1. Social Demographics	Latest information about Covid-19 pandemic	Electronic visual media	144	72.4
Relatives & friends 10.0   18 9   Table 1. Social Demographics		Newspaper	37	18.6
Table 1. Social Demographics		Relatives & friends	18	9

Questions		Numbers Answered	Percentage			
	Yes					
Are you aware of ongoing COVID - 19 infection pandemic?	No	202	100			
	Don't know					
	Spreads via respiratory droplets of infected individuals.	77	38.7			
	Touching the infected surfaces	26	13.1			
How do you think is the spread of COVID - 19 virus?	Through contact with infected individuals	53	26.6			
	None of the above	4	2			
	All of the above	39	19.06			
The main clinical symptoms of COVID - 19 are fever, fatigue, dry cough	Yes	160	80.4			
and myalgia?	NO	11	5.5			
	Don't know	27	13.6			
Diarrhoea, headache, redness of eyes and constipation are the symptoms	res	68	34.2			
of COVID 19 virus infection?	NU Don't know	69	34.7 21.2			
		20	10.1			
	< Toyears	132	10.1			
In which group of people is the disease more dangerous?	Promant women	40	20.1			
in which group of people is the disease more dangerous:	15 - 30 years	7	35			
	30 – 45 year	0	0			
It is advisable to visit fever clinic in the nearby hospital or contact a health	Yes	173	86.9			
care worker when you develop symptoms of fever, fatigue, dry cough &	No	10	5			
myalgia?	Don't know	16	8			
	V					
Catting program is cafe during the Cauid 10 per demia?	Yes	36	18.1			
Getting pregnant is safe during the Covid 19 pandemic?	N0 Don't know	99	49.7			
	DOILT KIIOW	64	32.2			
There are chances of transmission of corona virus from mother to haby	Yes	103	51.8			
during program (v)?	No	53	26.6			
during pregnancy?	Don't know	43	21.6			
Visiting a health care worker for regular antenatal check-up increases the risk of transmission of corona virus?	Yes	75	37.7			
	No	88	44.2			
	Don't know	36	18.1			
The risk of infection and complications is increased if I have complications	Yes	123	61.8			
like diabetes, asthma and anaemia in this pregnancy?	No	45	22.6			
internet and other and and other in the program by	Don't know	31	15.6			
Which of the following is the treatment for COVID 19?	Antibiotics	67	33.7			
	Vaccines	56	28.1			
	No treatment	31	15.6			
	Don't know	44	22.1			
1 aDie 2. Knowledge						

## **Original Research Article**

Questions		Numbers Answered	Percentage			
Social distancing is necessary during this pandemic as I am pregnant?	Yes	197	98			
	No	0	0			
	Don't know	3	2			
Changes in my distand taking additional systematical symplements halps in	Yes	175	87.9			
changes in my diet and taking additional nutritional supplements helps in developing immunity against corona virus?	No	17	8.5			
	Don't know	7	3.5			
It is botton to maintain assist distancing with valations and naighbours who	Yes	102	51.3			
It is better to maintain social distancing with relatives and neighbours who	No	90	45.2			
nave history of travel and contact history?	Don't know	6	3			
Annious about increased about a of patting infacted by Cavid 10 to the	Yes	109	54.8			
Anxious about increased chance of getting infected by Covid 19 to the	No	22	11.1			
mouner and baby?	Don't know	6	33.2			
	Yes	147	73.9			
i here can be complications in my pregnancy if i am infected with corona	No	25	12.6			
virus?	Don't know	27	13.6			
	Yes	147	73.9			
Testing for COVID 19 is necessary for all pregnant women?	No	25	12.6			
· · · ·	Don't know	27	13.6			
Women should avoid getting pregnant during the COVID 19 pandemic?	Yes	122	61.3			
	No	34	17.1			
	Don't know	43	21.6			
Social distancing is sufficient to control transmission of corona virus infection?	Yes	155	77.9			
	No	30	15.1			
	Don't know	13	6.5			
I think lockdown is essential to bring down transmission of this pandemic?	Yes	138	69.3			
	No	43	21.6			
	Don't know	17	8.5			
Table 3 Attitude						

Questions		Numbers Answered	Percentage			
I am maintaining social distance as I am pregnant	Yes	154	77.4			
	No	19	9.5			
	Don't know	23	11.6			
To prevent spreading the infection of COVID 19 I am wearing facial mask Only in public places & gatherings	Most of the time	160	80.4			
	Always	14	7			
	Never	23	11.6			
	Don't know	2	1			
I am washing hands frequently and rubbing hands with alcohol-based sanitizer frequently to prevent covid19 infection	Yes	190	95.5			
	No	0	0			
	Don't know	9	4.5			
I am staying indoors most of the time during lockdown and not visiting public gathering to prevent getting infected by COVID 19	Yes	193	97			
	No	3	1.5			
	Don't know	2	1			
Using herbal medicines and traditional supplements is helping me prevent infection during pregnancy	Yes	115	57.8			
	No	10	5			
	Don't know	74	37.2			
Table 4. Practice						

The questions on practices were on proper practice of social distancing, proper hand washing, maintaining social distance and use of herbal medicines and additional nutritional supplements to prevent infection. All antenatal women attending the outpatient department at K S Hegde Hospital, Mangalore who agreed to participate in the study completed the questionnaire.

#### Measures

The questionnaire consisted of 4 parts: demographics, knowledge, attitude and practices. A Covid-19 KAP questionnaire was developed. The questionnaire had 25 questions: 11 questions on knowledge, 9 questions on attitude, 5 questions on practices and 7 questions on demographic data. Three general questions on history of travel in recent days, source of information about the latest updates on Covid-19 and co-morbid conditions were asked. Questions were answered on a yes / no basis with additional I don't know option. Open ended questions were asked.

#### Statistical Analysis

A score of 1 was attributed to a correct answer and 0 to a wrong answer. The knowledge range was 6 - 9, for attitude 4 -

7 and 2 - 4 for practice. The overall scores of each individual were used to obtain mean scores for KAP. Bloom's cut off was used. Frequencies of correct knowledge answers and various attitude and practices were described. Chi-square test was utilized to compare categorical variables and ratios. Data analysis was conducted with SPSS version 23.0.

#### RESULTS

#### **Study Population Characteristics**

A total of 202 pregnant women participated in the study and all the study participants (100 %) were aware of the Covid-19 infection pandemic globally. The mean age of the study cohorts was 28 to 32 years, ranged from 18 to 40 years. All the participants were married (100 %). Primigravidas were 70 in number (35.2 %), multiparous with second gravida were 52 (26.1 %) and third gravida and more were 80 in number (38.7 %). Patients residing in urban area were 32.2 % and in rural area were 67.8 %. Most of the participants (72.4 %) had some formal education of minimum of secondary schooling. The pregnant women included in the study belonged to all gestational age with most of them belonging to 14 to 28 weeks (46.7 %). None of the women

had history of travel in recent days during pregnancy. Among 202 women, 144 women (72.4 %) got the information about Covid-19 through electronic visual media by news and radio and via newspaper by 37 women (18.6 %). Presence of comorbid conditions (pregnancy induced hypertension, gestational diabetes mellitus, asthma and tuberculosis) was seen in 8.5 % of pregnant women.

#### Knowledge Score Related to Covid-19

The depth of knowledge of preventive measures against coronavirus infection among the participants is shown in Figure 1. Cough, fever and difficult breathing were most common symptoms known by participants (80.4 %). Among the 202 pregnant women almost more than one third (34.2 %) of the participants knew that diarrhoea, headache, redness of eyes and constipation is a symptom of coronavirus infection. Most of the participants had a knowledge of the most common age group susceptible to the virus (66.4 %) was > 60 years. Majority of pregnant women (49.9) thought that getting pregnant during the pandemic was not safe. Most of the pregnant women (51.8 %) had opinion that if they are infected during pregnancy with Covid-19 infection then there are chances that the baby will get infected by vertical transmission. The knowledge regarding treatment for the virus was inadequate among majority of the participants.

#### Attitude Score Related to Covid-19

Among the pregnant women (98 %) women had good attitude towards the preventive measures against the infection. 197 women among 202 participants knew that social distancing is essential for preventing the infection. Most of the pregnant women (87.9 %) had changes in the diet and were taking additional nutritional supplements to help develop immunity against corona virus. The anxiousness and complications to the baby and the mother was high among the pregnant women (73.9 %). Many participants thought that avoiding pregnancy was safer in this pandemic. Most of the pregnant women wanted testing by reverse transcriptase polymerase chain reaction (RTPCR) during pregnancy for all pregnant women during delivery.

#### Practice Score Related to Covid-19

The preventive measures known by participants were washing hands frequently with soap and water or rubbing hands with alcohol-based sanitizers (95.5 %), maintaining at least 1-meter distance between yourself and others (77.7 %), avoiding touching eyes, nose and mouth with hands (75 %), covering mouth and nose when coughing or sneezing and wearing face mask in public (80.4 %). Many pregnant women preferred staying indoors during lockdown and not visiting public gatherings to prevent getting infected by Covid-19 (97 %). Participants had the opinion that using herbal medicines and traditional supplements would help to prevent infection during pregnancy (57.8 %).

#### DISCUSSION

Since the outbreak the pandemic has brought chaos to lives and economics around the world. As of now, India is facing biggest health emergency since the time country has gained independence.<sup>15</sup> The overall knowledge score was higher among the pregnant women. Multivariate analysis showed confounding factors (education level and occupation) as strong indicator of knowledge regarding Covid-19 which postulates the combination of better access to information and high education level leads to appropriate apprehension and comprehension of information on Covid-19, consequent to better knowledge on Covid-19. Most of the pregnant women had good knowledge about basic symptoms of corona virus such as fever, cough and breathlessness (77 %). They had good knowledge about the mode of spread of infection via respiratory droplets. The basic awareness about the mode of transmission and susceptible age group of more than 60 years was known to many pregnant women (66.3 %). Our study has strong association of knowledge significantly with positive attitude and practice. Through this study it was noted that many pregnant women were anxious about higher chance of infection to the baby by vertical transmission. Most of the women were of the opinion that it was not safe to get pregnant during the pandemic.

Anikwe et al. showed that majority of pregnant women in their third trimester in Nigeria demonstrated good attitude and preventative practices of Covid–19.<sup>8</sup> They followed good practising of hand washing, wearing masks, avoiding face touching and quarantining infected people as good practices towards the prevention of Covid-19 infection. In this study 95.5 % of women maintained social distance and practised hand washing and also use of alcohol-based sanitizer.

Yassa et al. focused on Turkish pregnant women in attitude, concerns and knowledge towards Covid-19 from 30 weeks gestation onwards<sup>12</sup> where Turkey was one of the most affected countries at the time of the study with over 20,000 cases and 425 deaths in April 2020.12 They showed that about 80 % of women felt vulnerable towards the outbreak and 45 % of women were confused or doubtful about the mode of delivery. In the study 50 % of pregnant women were not sure if breast feeding was safe.12 These views reflect the vulnerability of pregnant women despite differences in race or culture as pregnant women want the best outcome for themselves and minimize risk of vertical transmission to their baby. Hence it is of paramount importance for clinicians to reflect and counsel on the insecurities and worries of pregnant women towards Covid-19.

#### CONCLUSIONS

Majority of pregnant women demonstrated good knowledge, positive attitude and good practice regarding Covid-19 pandemic. The main concern of pregnant women was the vertical transmission of the infection to the baby during pregnancy. Proper counseling by the health care workers and supportive care by multidimensional approach will help decrease the consequences of the pandemic in all aspects. Increasing health education program regarding the pandemic

via different mass media and social media with the coordinated and combined efforts of government authorities and all individuals will be needed to battle the consequences of the pandemic. This will help address the effect of Covid-19 on pregnancy and pregnancy outcome.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jemds.com.

#### REFERENCES

- [1] Coronavirus Disease (COVID-19). Q & A 2020. (Updated on 17th April 2020: Cited on 2020, 28 April) https://www.who.int/news-room/q-a-detail/q-acoronaviruses
- [2] Coronavirus disease (COVID-19) advice for the public: mythbusters. WHO 2020. [updated 2020 April 19, cited 2020 Apr 29th]. https://www.who.int/emergencies/diseases/novelcoronavirus-2019/advice-for public/myth-busters
- [3] WHO. Infection prevention and control of epidemic-and pandemic-prone acute respiratory infections in health care. Geneva: World Health Organisation 2014. [2014; cited 2020 Apr 19]. https://www.ncbi.nlm.nih.gov/books/NBK214359
- [4] Bootsma MC, Ferguson NM. The effect of public health measures on the 1918 influenza pandemic in U.S. cities. Proc Natl Acad Sci U S A 2007; 104(18):7588-93.
- [5] Tomar BS, Singh P, Suman S, et al. Indian community's knowledge, attitude & practice towards COVID-19. medRxiv 2020.
- [6] Zhong BL, Luo W, Li HM, et al. Knowledge, attitudes and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a

quick online cross-sectional survey. Int J Biol Sci 2020;16(10):1745-52.

- [7] WHO. Coronavirus infections: disease outbreak news WHO 2020. [Updated on 25th July: cited on 2020 Apr 29]. https://www.who.int/emergencies/diseases/novelcoronavirus-2019
- [8] Anikwe CC, Ogah CO, Anikwe IH, et al. Coronavirus disease 2019: knowledge, attitude and practice of pregnant women in a tertiary hospital in Abakaliki, Southeast Nigeria. Int J Gynaecol Obstet 2020;151(2):197-202.
- [9] CDC. Clinical questions about covid-19: questions and answers. Centers for Disease Control and Prevention 2021. (Updated on 16<sup>th</sup> April 2020; cited on 2020, 20 April) https://www.cdc.gov/coronavirus/2019ncov/hcp/faq.html
- [10] Erfani A, Shahriarirad R, Ranjbar K, et al. Knowledge, attitude and practice toward the novel coronavirus (COVID-19) outbreak: a population-based survey in Iran. Bull World Health Organ. E-pub: 2020.
- [11] Corbett GA, Milne SJ, Hehir MP, et al. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. Eur J Obstet Gynecol Reprod Biol 2020;249:96-7.
- [12] Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: a systematic review of 108 pregnancies. Acta Obstet Gynecol Scand 2020;99(7):823-9.
- [13] Yassa M, Birol P, Yirmibes C, et al. Near-term pregnant women's attitude toward, concern about and knowledge of the COVID-19 pandemic. J Matern Fetal Neonatal Med 2020;33(22):3827-34.
- [14] Khalil A, Kalafat E, Benlioglu C, et al. SARS-CoV-2 infection in pregnancy: a systematic review and metaanalysis of clinical features and pregnancy outcomes. E Clinical Medicine 2020;25:100446.
- [15] Ministry of Health and Family Welfare. COVID-19 India (Updated on 29th Apr 2020: cited on 2020 Apr 29th). https://www.mohfw.gov.in/