Original Research Article

COVID-19 associated anxiety and perceived risk among the pregnant women: a cross-sectional study

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ABSTRACT

Background: COVID-19 is an infectious disease, categorized as a global pandemic. Daily implications and coping strategies of pregnant women with coronavirus outbreak is currently unknown. This study will assess their knowledge, attitude, and practices (KAP), risk perceptions, anxiety and concerns related to COVID-19.

Methods: A hospital-based cross-sectional survey was conducted in Karachi. Self-reported questionnaires including KAP, generalized anxiety disorder (GAD) scale and perception of pregnancy risk questionnaire were administered. Descriptive statistics were calculated for continuous variables and were reported as mean ± standard deviation. Frequencies and percentages were computed for categorical variables. Pearson correlation was calculated to explore linear associations among the perception of pregnancy risk, age, body mass index (BMI), and gestation. All data analysis was done using STATA 16.0.

Results: The 575 pregnant women were enrolled with an average age of 26.07 years and 27.22±8.99 gestational age. Their knowledge showed that 92.2% knew that coronavirus causes COVID-19 and 72.30% knew the importance of wearing masks. Regarding attitudes, 96.3% felt safe to breastfeed their newborns, 80.20% considered changing their birth method whereas 54.6% were not concerned about the outbreak and around 70-80% cancelled their social gatherings. 72% trusted healthcare frontline staff with their struggle towards COVID-19. The 43.82% women were more anxious (scoring ≥7) and 56.17% were less anxious (<7) on GAD scale. The mean score for perceived risk for baby and mother was 22.95±13.72 and 19.40±0.57 respectively.

Conclusions: Considering the burden of COVID-19, pregnant women's perception is a major contributor to her and her baby's health and wellbeing. Well-planned strategies by media, healthcare providers and government would significantly support such pregnant women during COVID-19.

Keywords: COVID-19, Risk perception, Pregnancy, Anxiety

INTRODUCTION

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus, classified as a global pandemic.[1] It is a novel type of coronavirus family with an incompletely described clinical course, and serious public health emergency that is deadly, especially in vulnerable populations including pregnant women; and communities where health systems are not adequately prepared to manage this infection.[2] Most people infected

with the COVID-19 virus experience mild to moderate respiratory illness and recover without requiring special treatment.[1] According to world health organization (WHO), over 150 million people have been infected worldwide with a death toll of 3.2 million.[3,4] National data declared that 3rd wave of COVID-19 is continued in Pakistan with positive cases ranging from 4,414 to 1,771 as of May 2021.[5] The number of new cases of COVID-19, identified during the process of field surveying in Karachi, Sindh ranged between 1769 to 101 cases per day, with two distinct peaks in the January and April 2021.[6]

Pregnant women are known to be more susceptible to the complications and adverse outcomes of coronavirus infection due to the gestation related physiological and immunity changes.[7,8] It is thought that COVID-19 may significantly increase the maternal and fetal risks such as preterm labor, premature rupture of the membranes, fetal tachycardia, and distress in the third trimester of pregnancy.[9-11] Centre for disease control and prevention (CDC) reported that pregnant women suffering from COVID-19 infection were more prone to hospitalization, admission in intensive care units, and needing ventilator support.[12] Whereas at some instances pregnant women are found to possess similar morbidity and mortality as compared to the general population.[13]

According to Villar and Colleagues, it is important to note that 59.2% of diagnosed cases from their study were symptomatic and were significantly more prone to poor outcomes and admission to an intensive care unit.[19] Higher rates of complications such as preeclampsia or eclampsia, severe infections, preterm births, and maternal deaths were noted in these women. Although such risks for asymptomatic pregnant women were lower but remained more than those who were not infected. Given the burden of maternal disease, the relative risk for severe perinatal and neonatal morbidity index were 2.14 and 2.66, respectively, in pregnant women who were infected in contrast to those who were not infected.

Despite the inconsistent data regarding its clinical outcomes, the unfavorable psychological outcome is almost certain.[11,14] An increased anxiety and decreased participation in the outpatient clinic appointments was observed for women who somehow managed to attend their routine antenatal follow-ups.[15,16] Royal college of obstetricians and gynecologists also highlighted greater risks of perinatal anxiety, depression, and domestic violence.[17] In Sri Lanka, pregnant women found to have severe depression and perinatal anxiety during pandemic season.[20] Such psychological consequences of outbreak may pose bigger challenge than clinical aspects.[18]

Although the pregnant women are more vulnerable, still very few studies have been conducted to assess their risk perception associated with the COVID-19 pandemic.[21] It is currently unknown how pregnant women cope with the present coronavirus outbreak and its daily implications. It

was emphasized that supporting women mentally is crucial. Pregnant women deserve a more sensitive approach and understanding during the current dramatic pandemic. To add in the existing pool of knowledge for our population; the present study was designed to assess the KAP of pregnant females regarding COVID-19, risk perception of pregnant females towards COVID-19, and anxiety and concerns related to COVID 19 (GAD-7).

METHODS

Participants and study design

A cross-sectional survey was carried out in a large, tertiary care hospital's outpatient facility from the obstetric department in Karachi, Sindh, Pakistan. The participants of the study were pregnant women visiting the facility for antenatal care. Women with healthy pregnancies, without medical/obstetrical complications, willing to participate were recruited in the study. Whereas the pregnant women with either signs or symptoms of current or prior known psychiatric illness were excluded from the study.

Sample size calculation

The calculated sample size for the study is 384 pregnant women rounded off to 400; considering 50% proportion, 90% response rate, 80% power of the study, design effect of 1, confidence level of 95% and the total error margin of 5%.[22] Taking into account, the unique opportunity and encouraging response from the potential participants and hospital administration, a total of 575 pregnant women were recruited in the study.

Data collection tool and procedures

A self-reported questionnaire was administered after obtaining the informed consent from the participants, considering all standard health protocols. It took about 25 to 35 minutes to complete the questionnaire. If the participant could not read or write, the form was filled by the study staff on their behalf. Participants were interviewed in detail about their KAP and risk perception regarding their health and pregnancy outcome in context of COVID-19.

Study tools

The questionnaire consisted of 4 major sections including:

Socio-demographic and obstetrics characteristics (20 items): This section included some basic information i.e., age, BMI, occupation, education level, place of residence, gestational age, parity, gravidity, number of children, history of abortion, history of influenza in previous pregnancies and sources of information about the COVID-19.

Knowledge, attitude and practices related to COVID-19 (COVID-19 KAP) (15 items each): The items were designed based on the health protocols by the World Health Organization (WHO) as well as from a publication of Iran.[14,15] The aspects of knowledge included symptoms, etiology, transmission, and public prevention. Correct answers were assigned 1 point and incorrect answers or "don't know" were assigned 0 points. For attitude related questions, respondent was asked to describe their approach as "Yes" or "No" and frequencies were calculated. Questions regarding the preventive behaviours included social distancing, frequent hand washing personal hygiene, public transportation and shopping. Responses will be marked as "True" or "False". 1 point will be assigned for each appropriate behaviour and 0 point will be marked for any of the inappropriate behaviours.

Generalized anxiety in context of COVID-19 (7 items): A validated GAD-7 scale was used to measure their anxiety and concerns about COVID-19. Women who scored <7 on GAD scale is considered as having less anxiety while those with GAD score ≥7 were considered more anxious about their pregnancy outcomes and family care.

COVID-19 related risk perception (7 items): The instrument consists of 9 visual analogue scales. Each item is scored by measuring the distance from the start. Using this scale perceived risks of maternal and foetal infection, abortion or fetal death, preterm delivery, fetal anomalies, hospitalization of the new-born in the neonatal intensive care unit, and maternal death due to coronavirus infection is measured.[17,23,24] Responses were recorded on a Likert range from "0" (no perceived risk) to "10" (high level of perceived risk). Each item is scored by measuring the distance from the start of the 100 mm line to the vertical mark placed through the line by the participant (score for each item ranges from 0 to 100). The score for each of the 9 items were added, and then the total score was divided by 9, to obtain an overall score out of 100.[25] Permission for use of the revised 9-item PPRQ was taken from the developer of this scale.[23]

Data management and statistical analysis

Data was collected on hard copies, and then was shifted to the data management unit (DMU) at Aga Khan university for data entry, archiving and analysis. Descriptive statistics were calculated for continuous variables and were reported as mean ± standard deviation (SD) Pearson correlation 'r' was calculated to explore linear associations among the perception of pregnancy risk, age, BMI, and gestational weeks. Using the one-way ANOVA. The frequencies and percentages were computed for categorical variables and the means and standard deviations were calculated for numerical variables. An alpha level of 0.05 was set for all statistical analyses. All descriptive and inferential statistics were conducted using STATA 16.0 version.

Confidentiality and ethical consideration

The study was approved by ethical review committee of the Aga Khan university. All procedures were in accordance with the ethical standards of the institutional research committee (IRC). Participant's personal identity and information collected was kept confidential. All interaction with the targeted group were only made after their consent and they were explained about the purpose of the data collection, and use of the collected information. Our team strictly avoided indulging into any conversation of political or religious nature, strictly escaped promising any favours to survey participants and did not guide the respondents to provide specific answers. Furthermore, the pregnant women identified with any psychological issue during the interaction were referred to the consultant and the issue was shared after the consent of the participant.

RESULTS

A total of 575 pregnant women were enrolled in this study. The average age of study participants was 26.07 years with a mean gestational age 27.22±8.99 weeks. The average BMI of women is 24.46±3.01. The average number of previous pregnancies and children was 1.52±1.49 and 1.45±1.46 respectively. More than half (51.5%) of the women had no education with vast majority of them being housewives (96.9%). Majority (84.7%) had their husbands employed and 68.9% living in their own houses. Most of the participants (61.4%) had no underlying disease. Whereas, greater than a quarter (29.9%) were found be anaemic. However, less than quarter (14.1%) were reported with blood pressure. Television was found to be the main source of information about COVID-19 pandemic by vast majority (98.8%) of the females followed by discussions within family, friends as well as with the neighbours as shown in the Table 1.

Knowledge of pregnant women regarding COVID-19 was assessed in Table 2. Vast majority (92.2%) of the females knew that this infection is caused by coronavirus while most of them (72.30%) had adequate knowledge about the need of wearing mask for everyone. More than half of them (63.1%) were of the view that its origin is unknown and had an idea about its symptoms (54.4%). However, many of them wrongly considered that it can be treated with antiviral agents (59%) and flu vaccine can prevent its spread (50%).

In the Table 3, attitude towards dealing with COVID-19 demonstrated vast majority (96.3%) of pregnant women felt it is safe to that breastfeed their new-born babies. However, many of them (80.20%) considered changing their birth method pertaining to this pandemic. Regarding complications that can occur during their pregnancies, birth defects and preterm births were thought of by (65.2%) and (52%) of the women. Surprisingly, more than half of the respondents (54.6%) were not concerned

about the outbreak, (60.5%) did not feel vulnerable and (61.9%) did not think that it might affect their unborn baby. Whereas (52.3%) declared that authorities have not taken adequate precautions. Yet around seventy-two percentage of them trusted healthcare and frontline staff with their struggle towards coronavirus outbreak and had feelings of respect and affection for them.

Change in practices of pregnant women were also noted during COVID-19 outbreak as shown in the Table 4. Vast majority revealed that they have cancelled friends and family gatherings (89.9%), avoided dining out (89.6%), parlours (76.3%), shopping (56%) as well as the use of public transport (67.1%).

Estimation of risk showed a level of perceived risk regarding COVID-19 among the pregnant females as is evident from Table 5. The mean scores ranged from 14.8 to 24 on a 100-point scale.

Table 6 reflected the level of generalized anxiety related to COVID-19 among enrolled pregnant women. It showed that 43.82% of pregnant women were more anxious scoring ≥7 while 56.17% were comparatively less anxious, scoring<7. The mean score of the perception of perceived risk for the baby was reported between 22.95±13.72 whereas for the mothers themselves, a mean of 19.40±0.57 was obtained. On average, the knowledge of the participants about the COVID-19 pandemic was 7.04±2.84. Besides, true practices of these were 8.4±3.53. The Pearson correlation revealed a weak positive association between risk perception and age, whereas an inverse and weak correlation was observed for risk perception with BMI and gestational weeks.

Table 1: Sociodemographic characteristics, (n=575).

Variables	N (%)
Age (Years), mean ± (SD)	26.07 (4.78)
Weight (kg), mean ± (SD)	62.50 (35.01)
Height (cm), mean ± (SD)	157.17 (6.64)
BMI, mean ± (SD)	24.46 (3.01)
Gestational age (weeks), mean ± (SD)	27.22 (8.99)
No. of deliveries, mean ± (SD)	2.67 (1.53)
No. of pregnancies, mean ± (SD)	1.52 (1.49)
Number of children, mean ± (SD)	1.45 (1.46)
Number of members in the household/family, mean ± (SD)	7.18 (4.80)
Number of children in the household, mean ± (SD)	2.15 (1.98)
Number of elderly people in the household, mean ± (SD)	0.38 (0.80)
Education level	
None	296 (51.5)
Secondary	70 (12.2)
Intermediate	45 (7.8)
Status of household	
Own	396 (68.9)
Rented	179 (31.1)
Occupation of the woman	
None	17 (3.0)
Housewife	557 (96.9)
Family type	
Nuclear	283 (49.2)
Joint family	290 (50.4)
Extended family	2 (0.3)
Employment status of husband	
Employed	487 (84.7)
Unemployed	88 (15.3)
Any underlying condition	
Anemia	172 (29.9)
Blood pressure	81 (14.1)
Cardiac disease including hypertension	3 (0.5)
Diabetes	6 (1.0)
Immunodeficiency	21 (3.7)
Liver disease	2 (0.3)
None of the above	353 (61.4)

Continued.

Variables	N (%)
Any history of abortion	
Yes	10 (1.7)
No	565 (98.3)
Source of information about COVID	
Internet (social media: Facebook and WhatsApp)	10 (1.7)
Television	568 (98.8)
Radio	5 (0.9)
Print media	42 (7.3)
Word of mouth: Family, friends and neighbors	134 (23.3)

Table 2: Knowledge about COVID-19, (n=575).

Items (True, false and don't know)	N (%)
Corona disease is an infection caused by the coronavirus	92.20
The origin of the disease is unknown, but it appears to have been transmitted to humans by bats, seafood, or snakes	63.10
Common symptoms of the disease are fever, cough, and shortness of breath	54.40
A person infected with the virus may look completely healthy	43.10
If infected, the person should quarantine for 14 days	41.60
Transmission is through respiratory droplets such as the cough as well as sneezing	42.60
The disease is transmitted through close contact with an infected person	40.70
Children do not get the disease	42
Pregnant women are more susceptible to the disease	44.70
The disease can be prevented by hand washing and personal hygiene	45.20
Medical masks are useful to prevent the transmission of respiratory drops	46.30
Lack of close contact can prevent the onset of the disease	47.80
Everyone in the community should wear a mask	72.30
Coronavirus can be treated with common antiviral drugs	59.70
The flu vaccine can be given every year to prevent the Corona virus	50.00

Table 3: Attitude related to COVID-19, (n=575).

Items (Yes, no)	Frequency (%)	
	Yes	**No**
Do you think that it is safe to breastfeed during the coronavirus outbreak?	96.30	3.70
Would you consider changing your birth method (Cesarean section or vaginal birth) considering the coronavirus outbreak?	80.20	19.80
Do you think that coronavirus can cause birth defects?	65.20	34.80
Do you think that coronavirus can cause preterm birth?	52.00	48.00
Are you concerned about the coronavirus outbreak?	45.40	54.60
Do you feel more vulnerable or weak during the outbreak because you are pregnant?	39.50	60.50
Do you constantly keep thinking that you may have or already have coronavirus?	40.50	59.50
Do you think that your baby might get infected after being born?	38.10	61.90
Do you think that you might get infected during or right after delivery?	43.70	56.30
Do you think that you have taken adequate precautions about the coronavirus outbreak?	47.10	52.90
Do you think that the authorities have taken precautions about the coronavirus outbreak?	47.70	52.30
Do you trust healthcare staff in the struggle against the coronavirus outbreak?	72.30	27.70
Did your feelings of affection and respect for the frontline healthcare staff increase during the coronavirus outbreak?	72.50	27.50
Would you obey the strict rules if you were asked to self-quarantine?	59.50	40.50
Did you commence on any vitamin or nutritional/dietary supplements because of the coronavirus outbreak?	45.90	54.10

Table 4: Practices related to COVID-19, (n=575).

Items (True, false)	True, n (%)
I have canceled meetings with family and friends	89.90
I don't eat out-of-home prepared foods, or in restaurants	89.60
I canceled going to the parlor	76.30
I have reduced the use of public transportation	67.10
I don't go out shopping	56.00
I have reduced going to closed spaces such as libraries, theaters, and cinemas	40.30
I avoid coughing near people, as much as possible	36.50
I have avoided places where a large number of people have gathered	36.00
I have increased the cleaning and disinfection of items that can be easily touched by hand (i.e., door handles and surfaces)	40.30
I get my hands wash more than usual	43.80
I avoid hugging and kissing children and family members	41.60
I keep my distance from others at home	46.40
I clean and disinfect items that are purchased from abroad	51.00
My family and I watch TV programs that teach the basics of healthcare	51.70
I've talked to my family and friends about preventing coronavirus	73.40

Table 5: Perception of pregnancy risk, (n=575).

Perception of pregnancy risk	N (%)
The risk for myself during this pregnancy is	23.93 (14.16)
The risk for my unborn baby during this pregnancy is	22.88 (15.37)
My risk of hemorrhaging (losing too much blood) during this pregnancy is	23.23 (15.39)
My risk of having a cesarean section is	24 (15.53)
My risk of dying during this pregnancy is	20.64 (14.83)
My baby's risk of being born prematurely is	23.33 (16.16)
My baby's risk of having a birth defect is	23.33 (15.88)
My baby's risk of needing to go to the neonatal intensive care unit is	16.24 (14.09)
My baby's risk of dying during this pregnancy is	14.81 (14.37)

Table 6: Anxiety and risk perception of pregnancy, (n=575).

Variables	N (%)
GAD-7 anxiety$^\$$	
Less anxiety<7	323 (56.17)
More anxiety≥7	252 (43.82)
Scoring GAD-7 anxiety severity	
Minimal anxiety=1	226 (53.42)
Mild anxiety=2	189 (80.43)
Moderate anxiety=3	145 (86.83)
Severe anxiety=4	15 (78.95)
Perception of pregnancy risk	
Risk for baby, mean ± (SD)*	22.95±13.72
Risk for myself, mean ± (SD)#	19.40±0.57
Pearson correlation	
Risk perception vs age	0.042
Risk perception vs gestational weeks	-0.07
Risk perception vs BMI	-0.049
Knowledge and practice about COVID-19 pandemic	
Correct knowledge of about COVID-19, mean ± (SD)	7.04±2.84
True practice about COVID, mean ± (SD)	8.4±3.53

*Risk of unborn baby, premature baby, baby birth defect, Neonatal ICU, dying during pregnancy. # Risk for during pregnancy, risk of hemorrhaging, Caesarean section, dying during pregnancy.

Table 7: Association between correct score, knowledge, and risk perception and GAD, (n=575).

Variables	N (%)	True practice, mean ± SD, p value	Correct knowledge, mean ± SD, test statistic	Risk perception, mean ± SD, test statistic	GAD-7 anxiety, (Categories)
Age (Years)					
≤15	1 (0.17)	8±0	7±0	17.77±0	4±0
≥16-≤26	334 (58.09)	8.08±3.63	6.81±2.89	30.70±12.18	1.69±0.83
≥27-≤37	23 (4)	8.91±3.07	6.04±3.41	19.80±11.36	1.78±0.85
≥28-≤49	217 (37.74)	8.83±3.39	7.52±2.62	22.60±13.43	1.78±0.85
		0.09	0.01*	0.33	0.02*
Gestational weeks					
≤10	45 (13.5)	7.11±3.37	6.911±2.85	22.46±10.519	1.68±0.87
≥11-≤20	66 (19.8)	7.74±3.39	7.10±2.82	24.47±13.48	1.89±0.82
≥21-≤30	163 (48.8)	8.26±3.95	6.87±2.92	20.49±12.78	1.90±0.84
≥31-≤42	60 (18.0)	9.36±3.26	7.56±2.64	23.57±13.86	2.11±0.84
		0.01*	0.43	0.13	0.08
Education					
Illiterate=1	296 (51.48)	8.16±3.48	6.98±2.77	19.82±12.01	1.83±0.85
Pre-primary=2	77 (13.39)	8.61±3.92	7.07±2.76	20.77±12.93	1.96±0.88
Middle (6-8) and secondary=2	145 (25.22)	8.68±3.38	7.06±2.89	23.59±12.78	1.66±0.84
Intermediate and graduation=3	51 (8.87)	8.45±3.57	7.17±3.23	25.22±13.93	1.59±0.80
Masters and PhD=4	6 (1.04)	10±4.28	8.5±2.42	19.62±14.51	1.69±0.83
		0.93	0.76	0.00*	0.002*
Status of household					
Own	396 (68.87)	8.72±3.50	7.3±2.80	22.24±12.53	1.92±0.85
Rented	179 (31.13)	7.68±3.50	6.48±2.83	19.47±12.72	1.87±0.86
		0.00*	0.00*	0.01*	0.45
History of abortion					
Yes	10 (1.74)	10.7±3.68	7.9±2.84	34.11±18.24	2±0.47
No	565 (98.26)	8.35±3.52	7.03±2.84	21.15±12.43	1.90±0.86
		0.03*	0.33	0.001*	0.74
No. of pregnancies					
1	161 (28)	8.12±3.57	7.13±2.98	22.67±12.70	1.96±0.86
2	143 (24.87)	8.27±3.59	6.97±2.57	21.77±12.48	1.90±0.89
3	110 (19.13)	8.40±3.36	7.04±2.98	19.54±11.21	1.90±0.81
>4	161 (28)	8.77±3.56	7.02±2.83	20.99±13.56	1.86±0.85
		0.39	0.96	0.23	0.74
No. of children					
No child	203 (35.30)	7.95±3.53	7.01±2.82	22.41±12.39	1.94±0.87
1-4 child	352 (61.22)	8.67±3.49	7.06±2.87	20.97±12.94	1.90±0.85
5 or above child	20 (3.48)	8.2±3.91	7±2.51	18.11±8.89	1.7±0.86
		0.06	0.97	0.21	0.48
No. of deliveries					
0 deliveries	186 (32.35)	8.04±3.57	7.00±2.90	22.47±12.45	1.94±0.88
1-4 deliveries	368 (64)	8.60±3.49	7.05±2.83	21.00±12.89	1.91±0.85
Five or above deliveries	21 (3.65)	8±3.84	7.285±2.51	18.30±9.05	1.66±0.85
		1.69	0.1	0.22	0.38
Family type					
Nuclear	283 (49.2)	8.38±3.65	7.16±2.78	20.28±11.63	1.89±0.89
Joint family	290 (50.4)	8.43±3.42	6.97±2.89	22.43±13.52	1.93±0.83
Extended family	2 (0.3)	5.5±3.53	5.5±2.12	23.88±10.21	1±0
		0.50	0.49	0.12	0.29

Continued.

Variables	N (%)	True practice, mean ± SD, p value	Correct knowledge, mean ± SD, test statistic	Risk perception, mean ± SD, test statistic	GAD-7 anxiety, (Categories)
GAD-7 anxiety (Categories)					
0-4 (Minimal anxiety)	226 (39.30)	8.15±4.02	7.40±2.99	17.31±12.22	-
5-9 (Mild anxiety)	189 (32.87)	8.87±3.44	7.17±2.95	24.26±11.95	-
10-14 (Moderate anxiety)	145 (25.32)	8.11±2.82	6.33±2.38	23.04±12.06	-
15-21 (Severe anxiety)	15 (2.61)	8.4±2.50	6.93±1.86	30.29±15.80	-
		0.15	0.00*	0.00*	-
GAD-7 anxiety (Dichotomous)					
Less anxiety <7	323 (56.17)	8.47±3.81	7.45±3.02	19.24±12.36	1.30±0.45
More anxiety ≥7	252 (43.83)	8.29±3.14	6.52±2.49	24.11±12.50	2.69±0.57
		0.54	0.00*	0.00*	0.000*

*Significant at 5%

The association between the categories of correct score, knowledge, and risk perception related to COVID-19 is showed in Table 7. In the maternal age category, the highest correct practice mean was 8.91 in 27-37-year-old age group and for correct knowledge 7.52 for age interval 28-49 years old while females >27 years of age were more likely to have a mean GAD score of 1.78±0.85. The maximum number of women having gestational age group 31-42 weeks had highest true practice average of about 9.36 in contrast to their counterpart. Females having education level of Intermediate, and Graduation were more prone to high-risk perception scores of 25.22±13.93 whereas those who had complete pre-primary were found more anxious on GAD scale with a mean of 1.96±0.88. These results were statistically significant. There was also a significant high average score of risk perception (p=0.001) in those who had a previous history of abortion. It is also worth noticing that those females who showed severe anxiety on GAD scale, had statistically significant high scores of risk perception (p=0.00) as compared to other groups.

DISCUSSION

The present study was initiated to assess the level of risk perception, anxiety, knowledge level, and preventive behavior as well as the relevant determinants related to the COVID-19 pandemic among pregnant women as they are categorized in the more susceptible and vulnerable population. The risk perception was not high amongst the women in the present study both for themselves and their babies. However, sufficient knowledge and inclination towards protective behaviors was seen among the study respondents. In a study by Nwafor et al 60.9% of African pregnant women showed adequate knowledge of preventive measures against COVID-19.[26] Literature showed that the high chances of having correct knowledge regarding COVID-19 pandemic was found with increasing ages and this was also evident in our study and Ghana. This can be explained by the fact that older women are more health-conscious and tend to inquire and get information regarding their health and well-being more readily than younger women.[27] In the similar context, majority of them (72.3%) were aware that wearing masks can prevent disease and everyone should wear it; which was in conjunction with Iranian pregnant women (62%) beliefs.[11]

The study under discussion has a few weaknesses and limitations. Firstly, due to high COVID-19 infection rate at the time of data collection, many women who would have been more anxious and perceived it as a dangerous pathogen would have chosen to stay home, forgoing the antenatal care to smaller clinics/hospitals or had teleconsultation, thus skewing the sample in favor of less worried women. Secondly, the hospital chosen was one of the largest tertiary care hospitals in the city and being a state hospital provided cheap and/or free services. Many women in the city opt for private hospitals and maternity service providers for maternity care. This attracts lower socioeconomic strata women who are often illiterate and do not have a good understanding of health education. Varying and opening the study to other hospitals and having a mix of public-private settings and size variation of the hospitals chosen could help with having a truly representing sample. Thirdly, when the data was collected, a peak of COVID-19 was ending; with people believing that this pandemic is ending; thus, decreasing their anxiety levels.

Study findings revealed that the main source of information regarding the COVID-19 was television; with almost all women citing television as the main source of information for our study participants. This was in agreement with what was reported by Ethopia, Iran and Nigeria.[11,28,29] According to Nausheen and team, pregnant women are becoming more anxious and such worries that are commonly due to the sensationalism in reporting news in the media. In their survey, 73% pregnant women reported anxiety and nervousness while watching the news or using social media.[30] While pandemic is novel and the individuals are not able to respond proactively to this situation because of the lack of preparedness, social media can play a robust role in generating optimism, and educating the masses on being compassionate, responsible and to remain united.[31]

Many of the women from the current study declared that they had cut down their social activities and have minimized their outgoings. In Pakistan, pregnant women are subject to neglect in many rural settings as well in urban households. Misleading information coupled with poor maternal health, stress and limited prospects of timely medical intervention along with anxiety and fear of contracting coronavirus during any unfortunate social contact is becoming scary scenario for such women and their families.[32,33] Yet, the prompt response generated by the government including precautionary measures and stringent control in the form of lockdown and travel ban in order to safeguard the nation against COVID-19 and to have a control over it, was given a positive attitude by our respondents. Recent studies from Saudi Arabia and China found that majority of their population were convinced that the government will control the COVID-19 outbreak and will win the battle. Moreover, Azlan and colleagues showed encouraging attitudes of Malaysians towards the successful control of the COVID-19 by government.[34,35]

A Turkish study observed high level of trust for authorities (65%) and the healthcare staff (92.4%) and their respect got increased (82.5%) during the outbreak among pregnant women.[15] Our study findings were somewhat different as Pakistani women think that authorities were not contributing efficiently to the outbreak while the affection and respect towards healthcare staff was greatly present among them. On the other hand, Turkish women were very much (82.7%) about complying with self-quarantine rules in contrast to our study population (59.5%) Half of their women (52%) felt vulnerable and predominantly were concerned (80%) while 45% women from the present survey were concerned and 39% felt vulnerable. More than one-third pregnant women from Pakistan (40.5%) as well as Turkey (35.5%) constantly keep thinking that they may get infected or have already been infected with coronavirus. Similar number of females also consider that their baby might get infected after birth (38% vs. 42%). It is worth mentioning that vast majority of our females (96.3%) believe that it is safe to breastfeed during the coronavirus outbreak; yet around 50% Turkish females had no idea about it.

House ownership signifies better economic status. In our study, it was reflected that those having their own house showed a better practice adherence and knowledge to the COVID-19 protocols. This was supported by a direct linear correlation reported by a Chinese, Saudi and Egyptian studies.[36-38] Others significant factors influencing the KAP included university education as in Iranian females which was in line with our study.[11] Those Iranian women having more children had higher knowledge, better preventive behavior and lower risk perception. As per Nwafor et al African women who had given birth five or more times had minimal awareness about preventive measures related to COVID-19.[26] Whereas such association was observed in the present study. In Malaysians, bigger household income and maternal employment and were independently linked with adequate COVID-19 knowledge.[34]

On a similar note, risk perception for COVID-19 was higher amongst homeowners and those with higher education. This could be explained by the fact that individuals in lower socioeconomic strata tend to have less access to authentic information regarding the pandemic, leading to lower situational awareness and risk perception. Women are more concerned about themselves and their babies' health when they go for a delivery; while in our study 80% of then considered changing their usual methods of giving birth.[39] This perceived risk was also higher amongst those who had a prior history of abortion. This could be attributed to the fear of 'losing the child again' and the fact that women with a history of abortions are more susceptible to mental health problems; as also supported by the literature.[40] Published data also demonstrated that nulliparous women had a higher level of risk perception related to COVID-19 than multiparous women.

GAD score showed mild to moderate anxiety (>80%) for majority of the pregnant women in regard to their current pregnancy being affected by COVID-19. Researchers in China found 78% women to be suffering from low-to-moderate antenatal psychosocial stress, while 6% had high-level psychosocial stress.[41] Likewise, In Sri Lanka, they were affected deeply by perinatal anxiety and depression during the same pandemic season.[42] A recent survey from Karachi elicited that 60% of the sampled population was undergoing a high level of fear with the COVID-19 pandemic during pregnancy.[30] Contextually, Pakistani society is complex and is divided into of urban and rural populations having diverse viewpoints, mindsets, education levels and cultural differences. Mostly pregnant women are ill-informed and lack necessary resources for understanding credible information along with limited access to healthcare professionals; hence making them anxious and worried about their pregnancies.[30]

Considering the burden of infectious diseases like COVID-19, a person's perception counts as a major contributor to their physical as well as mental health. With existing unsatisfactory healthcare outcomes for women, the unprecedented burden of COVID-19 pandemic could have a detrimental impact on pregnant females' health and well-being. There is a need to first screen them for their anxiety levels and then develop program and policies that can provide them relevant and correct information; thus, helping them in coping and managing stress. In such crisis, the efficacy of the different psychotherapeutic techniques like counselling sessions is undeniable, and it has been witnessed in different research studies and can overcome misleads. Well-planned mass communication by media agencies and government would significantly support pregnant and lactating women during COVID-19 to develop a strong mindset and resilience in choosing to follow

precautionary measures for themselves as well as their family's well-being.

CONCLUSION

Considering the burden of COVID-19, pregnant women's perception is a major contributor to her and her baby's health and wellbeing. Well-planned strategies by media, healthcare providers and government would significantly support such pregnant women during COVID-19.

ACKNOWLEDGEMENTS

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