

# Knowledge, Attitude, Practices and Risk of Psychological Distress among Frontline Healthcare Workers towards COVID-19 in Second Wave

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## ABSTRACT

**Introduction:** Frontline Healthcare Workers (F-HCWs) are at the front position for medical care against Coronavirus Disease 2019 (COVID-19) pandemic which has life-threatening potentials. Poor level of knowledge, practices and negative attitudes as well as high-risk of psychological distress among F-HCWs can directly lead to delayed diagnosis, treatment and poor infection control practices.

**Aim:** To assess the level of Knowledge, Attitude and Practices (KAP) as well as risk of psychological distress among F-HCWs for COVID-19 pandemic.

**Materials and Methods:** This descriptive, hospital-based, cross-sectional study was conducted at Government Medical College, Azamgarh, Uttar Pradesh, India, located in a tertiary care centre in rural area from October 2021 to December 2021 among 223 F-HCWs using convenient sampling technique. To assess the level of KAP as well as risk of psychological distress among F-HCWs, a prevalidated structured questionnaire was used consisting of 15 knowledge questions, six attitude questions, 15 practices

questions and six questions on risk of psychological distress. Chi-square test was performed to examine the association between risk of psychological distress and level of KAP as well as with demographic characteristics of F-HCWs.

**Results:** Out of total 223 participants more than half of the physicians (52.9%) and one-third of staff nurses (35.9%) were from age group of 25-35 years, respectively. Majority of both physicians (57.1%) and staff nurses (87.6%) were married and had nuclear type of family, accounting for 64.3% and 74.5%, respectively. Most of the physicians (92.9%) had good level of knowledge but they had less positive attitude (84.3%) compared to staff nurses (92.8%). Majority of both physicians (64.3%) and staff nurses (58.2%) had no or low risk of psychological distress, while only a few of them had high level of risk.

**Conclusion:** In this study, majority of F-HCWs reported overall 'good' level of KAP for prevention of COVID-19. As for risk of psychological distress was concerned, majority of F-HCWs had no or low risk.

**Keywords:** Feeling nervous, Low risk, Mental health, Pandemic, Physicians, Staff nurses

## INTRODUCTION

World Health Organisation (WHO) declared Coronavirus Disease 2019 (COVID-19) a global pandemic on 11<sup>th</sup> March 2020 [1]. As per WHO, till now, prevention is the only strategy to protect people's health and prevent the spread of this outbreak. The WHO has issued many guidelines on COVID-19 for various sectors of society, and has provided a range of education and training materials to Healthcare Workers (HCWs) to increase their awareness and preparedness for COVID-19 control and prevention [2]. Standard recommendations to prevent the spread of COVID-19 include; wearing facemask, frequent cleaning of hands using alcohol-based hand-rub or soap and water, covering the nose and mouth with a flexed elbow or with disposable tissue while coughing and sneezing and avoiding close contact with anyone who has a fever and cough [2].

Healthcare workers are at risk of contracting infectious diseases, caused by blood, body fluids, airborne pathogens and they are exposed to highest level of risk when there has been sustained, close contact with a case of COVID-19 or in high-risk transmission settings [3,4]. Healthcare workers are mainly involved in the management of patients, hence amongst the high-risk groups of acquiring the infection. Therefore, these at-risk groups should also be given adequate social and mental health support [5]. It was reported that statistically significant higher levels of psychological distress ( $p < 0.001$ ), burnout ( $p = 0.019$ ) fear, stress, emotional, ethical, and social conflicts and tension in healthcare providers at workplace; those who were providing direct patient care to infected patients or those who had survived infection [6,7]. The HCWs play a very big

role in controlling the spread of communicable or non-communicable diseases as well as the impact of unintended consequences of any future pandemic.

Knowledge about disease may affect HCWs' attitudes and practices, and incorrect attitudes and practices directly increase the risk of infection [8]. The second wave of the COVID-19 pandemic had very high infection and high mortality rate [9]. Therefore, it is necessary to ascertain and improve the level of knowledge, attitude and practices as well as to reduce the risk of psychological distress among Frontline Healthcare Workers (F-HCWs) whereby, infection and mortality rate due to it can be prevented in future. Therefore, this study aimed to assess the level of knowledge, attitude, practices and risk of psychological distress among F-HCWs regarding COVID-19 as well as to look for association between their socio-demographic characteristics and risk of psychological distress among them.

## MATERIALS AND METHODS

This descriptive, hospital-based, cross-sectional study was conducted at Government Medical College, Azamgarh, Uttar Pradesh, India, located in a tertiary care centre in rural area from October 2021 to December 2021 among 223 F-HCWs using convenient sampling technique. The studied F-HCWs were assured of maintaining anonymity and confidentiality of collected data and they were informed that they had the right to withdraw from the study at any time, despite having given consent. Helsinki declaration of 1975, revised in 2013 was considered for the study [10]. Approval was obtained from the Institutional Ethics Committee (IEC) (letter no.:1663/GMCA/IEC/2021 dated:19/9/2021). An informed written

consent was taken from all the eligible participants prior to inclusion in the study.

Non probability method of convenient sampling technique was used to select 223 study subjects. Out of total 186 physicians and 202 staff nurses working at Government Medical College, only 70 physicians and 153 staff nurses participated in this study. Rest of the healthcare providers were on duty in COVID-19 and non COVID-19 wards.

**Inclusion criteria:** F-HCWs who already had done their duty in COVID-19 ward and also had willingness to participate in the study.

**Exclusion criteria:** F-HCWs with severe illness and who were not willing to participate in the study.

### Procedure

Data on KAPs were collected by using predesigned, pretested and structured questionnaires. It was developed by researchers on the basis of a literature review of previously published relevant questionnaires, in keeping with the WHO and Centers for Disease Control and Prevention (CDC) recommendations [11-13]. To assess the risk of psychological distress among F-HCWs, Kessler (K6) scale was used [14]. Questionnaire was validated by an expert and pretested on a sample of 15 F-HCWs who worked in COVID-19 ward and were excluded from the final sample selection process. The Cronbach's alpha coefficient of KAP, as well as questionnaire on psychological distress was 0.71, 0.80 and 0.70 as well as 0.81, respectively, indicating acceptable internal consistency. The results of the pilot survey were not included in the samples used for the actual study. The questionnaire used for collecting data to meet the purpose of the study, comprised of five parts.

#### Part-1 (Socio-demographic characteristics)

This included the socio-demographic characteristics of F-HCWs, such as age, gender, marital status, types of family, religion, and caste.

#### Part-2 (Knowledge)

The participants' knowledge (15-items) was assessed about COVID-19.

- The 1<sup>st</sup> question allowed for multiple responses where they were asked for the most common symptoms of COVID-19 with a listed option assigned a score of one and zero. For this assessment, a participant was scored one for mentioning atleast three main symptoms of fever, dry cough and difficulty in breathing, otherwise zero.
- The remaining 14 questions were assigned a score of zero if the response was incorrect or 'don't know' and one if the response was correct. Hence, the cumulative score for all 15 questions ranged from 0 to 15 points for each participant. Participants' overall knowledge was graded using Bloom's cut-off point as 'good' if the score was  $\geq 80\%$  ( $\geq 12$  points) [15].

#### Part-3 (Attitude)

The participants' attitude (6-items) was assessed, which included questions about attitudes towards COVID-19 control, its threat to the community, Importance of lockdown and responsibilities of the government, individuals and community to prevent COVID-19. Each correct answer was given one point, but an incorrect or do not know answer was given a score zero. Thus, total score of attitude of a participant was from zero to six. Participants' overall attitude level was categorised using Bloom's cut-off point as 'positive' if the score was  $\geq 80\%$  ( $\geq 5$  points) [15].

#### Part-4 (Practices)

The participants' practices (15-items) for prevention of COVID-19 were assessed by using Likert scale on frequency based questions. Responses of questions from 1 to 11 were very frequently, frequently, occasional, rarely and never, each weighing 4, 3, 2, 1 and 0, but question numbers 12 to 15 were weighed 0, 1, 2, 3 and 4, respectively. Thus, the cumulative score for all 15 questions

ranged from 0 to 60 points for each participant. Participants' overall practices were categorised using Bloom's cut-off point as 'good' if the score was  $\geq 80\%$  ( $\geq 48$  points) [15].

#### Part-5 (Psychological distress)

This included questions on the participants' risk of psychological distress, which was assessed by using Kessler Psychological Distress Scale (K6) [14]. It was developed to detect the general psychological distress, and has demonstrated good reliability and validity. It has six questions about their feelings during the past 4 weeks. It includes; sad, nervous, restless, hopeless, everything is an effort, and worthless. There were five response options for each question, ranging from none of the time, a little of the time, some of the time, most of the time, and all of the time, scoring; 0, 1, 2, 3 and 4, was assigned to each response, respectively. Total score ranging 0-24, was calculated by summing up the responses to each question. Participants were classified for risk of psychological distress scoring [14]:

- No or low risk:  $<5$
- Mild/moderate risk:  $5 \leq K6 < 13$
- High/severe risk:  $\geq 13$

All the preventive measures were taken during the course of the study as per recommended guidelines [12,13].

## STATISTICAL ANALYSIS

After compilation of data, analysis was done using the Statistical Package for the Social Sciences (SPSS) version 16.0, trial version. Descriptive statistics was used to analyse the basic information regarding the study. Mean, standard deviation and Chi-square test were used for data analysis. A p-value  $<0.05$  was considered as statistically significant.

## RESULTS

Out of total 70 physicians and 153 staff nurses; 37 (52.9%) and 55 (35.9%) were from age group of 25-35 years. As per gender, majority 58 (82.9%) of physicians were male whereas most of the staff nurses 144 (94.1%) were female. Majority of physicians 40 (57.1%) and staff nurses 134 (87.6%) were married and had nuclear type of family, which included 45 (64.3%) and 114 (74.5%), respectively. Religion wise, most of physicians 62 (88.6%) as well as staff nurses 138 (90.2%) were Hindu while as per caste, majority 102 (66.7%) of staff nurses were from general category [Table/Fig-1].

Variables	Physicians		Staff nurses		
	n	%	n	%	
Age (years)	<35	37	52.9	55	35.9
	35-45	24	34.3	54	35.3
	>45	09	12.9	44	28.8
Gender	Male	58	82.9	9	5.9
	Female	12	17.1	144	94.1
Marital status	Married	40	57.1	134	87.6
	Un-married	30	42.9	19	12.4
Family type	Nuclear	45	64.3	114	74.5
	Joint	25	35.7	39	25.5
Religion	Hindu	62	88.6	138	90.2
	Muslim	08	11.4	06	3.9
	Others	00	0.0	09	5.9
Caste	General	24	34.3	102	66.7
	Other backward classes	28	40.0	36	23.5
	Scheduled castes	18	25.7	15	9.8
Total	70	100	153	100	

[Table/Fig-1]: Distribution of F-HCWs according to demographic characteristics (n=223).

Overall KAP of physicians was 65 (92.9%), 59 (84.3%), and 62 (88.6%), respectively. Overall KAP of staff nurses was 134 (87.6%), 142 (92.8%), and 121 (79.1%), respectively. The mean of physicians' knowledge (12.5±0.9) and practices (53.7±3.3) were higher than the mean of staff nurses' knowledge (11.9±1.4) and practices (48.8±5.3). However, the mean level of attitude among staff nurses (5.1±0.7) was a little higher than the physicians (4.9±0.6). The data shows that attitude of F-HCWs was found to be significantly associated (p=0.048) with type of F-HCWs [Table/Fig-2].

Variables		Physicians		Staff nurses		p-value (Chi-square test)
		Good score (n, %)	Good score (n, %)	Good score (n, %)	Good score (n, %)	
Knowledge	Score	65	92.9	134	87.6	0.240
	Mean±SD	12.5±0.9		11.9±1.4		
Attitude	Score	59	84.3	142	92.8	0.048
	Mean±SD	4.9±0.6		5.1±0.7		
Practices	Score	62	88.6	121	79.1	0.086
	Mean±SD	53.7±3.3		48.8±5.3		
Overall level of good knowledge		199 (89.2%) Mean=12.1±1.3				
Overall level of good attitude		201 (90.1%) Mean=5.1±0.7				
Overall level of good practices		183 (82.1%) Mean=50.4±5.3				

**[Table/Fig-2]:** Knowledge, attitude and practices (KAP) of F-HCWs regarding prevention of COVID-19 (N=223).

About two-third of physicians 45 (64.3%) and more than half of staff nurses 89 (58.2%) had no or low risk of psychological distress where its mean level among physicians was low (6.3±3.4) compared to staff nurses (6.5±3.8). Only few of them had high/severe risk of psychological distress where staff nurses 17 (11.1%) were affected more than physicians 5 (7.1%). The data shows that the risk of psychological distress was insignificantly associated (t=0.38, p=0.70) with type of F-HCWs [Table/Fig-3].

Subjects	Risk of psychological distress				p-value
	No or Low (n, %)	Mild/Moderate (n, %)	High/Severe (n, %)	Mean±SD	
Physicians	45 (64.3%)	20 (28.6%)	5 (7.1%)	6.3±3.4	p=0.70
Staff nurses	89 (58.2%)	47 (30.7)	17 (11.1)	6.5±3.8	

**[Table/Fig-3]:** Overall risk level of psychological distress among F-HCWs (N=223) t=0.38.

Variables	Risk level among physicians			Risk level among staff nurses		
	Low (n, %)	Moderate (n, %)	High (n, %)	Low (n, %)	Moderate (n, %)	High (n, %)
<b>Age <math>\chi^2=5.413</math>; p-value=0.247; <math>\chi^2=5.781</math>; p-value=0.216</b>						
<35	26 (57.8%)	10 (50%)	1 (20%)	35 (39.3%)	18 (38.3%)	2 (11.8%)
35-45	13 (28.9%)	7 (35%)	4 (80%)	32 (36%)	14 (29.8%)	8 (47.1%)
>45	6 (13.3%)	3 (15%)	0	22 (24.7%)	15 (31.9%)	7 (41.2%)
<b>Gender <math>\chi^2=1.984</math>; p-value=0.371; <math>\chi^2=0.343</math>; p-value=0.842</b>						
Male	38 (84.4%)	17 (85%)	3 (60%)	6 (6.7%)	2 (4.3%)	1 (5.9%)
Female	7 (15.6%)	3 (15%)	2 (40%)	83 (93.3%)	45 (95.7%)	16 (94.1%)
<b>Marital status <math>\chi^2=1.150</math>; p-value=0.563; <math>\chi^2=1.357</math>; p-value=0.507</b>						
Married	25 (55.6%)	13 (65%)	2 (40%)	80 (89.9%)	39 (83%)	15 (88.2%)
Unmarried	20 (44.4%)	7 (35%)	3 (60%)	9 (10.1%)	8 (17%)	2 (11.8%)
<b>Family type <math>\chi^2=1.400</math>; p-value=0.497; <math>\chi^2=4.650</math>; p-value=0.098</b>						
Nuclear	27 (60%)	15 (75%)	3 (60%)	62 (69.7%)	36 (76.6%)	16 (94.1%)
Joint	18 (40%)	5 (25%)	2 (40%)	27 (30.3%)	11 (23.4%)	1 (5.9%)
<b>Religion <math>\chi^2=2.384</math>; p-value=0.304; <math>\chi^2=2.223</math>; p-value=0.695</b>						
Hindu	41 (91.1%)	16 (80%)	5 (100%)	80 (89.9%)	42 (89.4%)	16 (94.1%)
Muslim	4 (8.9%)	4 (20%)	0	4 (4.5%)	1 (2.1%)	1 (5.9%)
Other	0	0	0	5 (5.6%)	4 (8.5%)	0

[Table/Fig-4], shows that majority of physicians and staff nurses who had 'good' level of KAP as of 44 (67.7%), 40 (67.8%), 40 (64.5%) and 76 (56.7%), 81 (57.0%) 70 (57.9%), respectively they also had low or no risk of psychological distress and only few of them had its high-risk. Statistically significant (p<0.001) association was found between the level of knowledge and risk of psychological distress among physicians.

Subjects		Risk level of psychological distress			$\chi^2$	p-value
		Low/No (n, %)	Mild/Moderate (n, %)	High/Severe (n, %)		
Physicians	<b>Knowledge level</b>					
	Good	44 (67.7%)	19 (29.2%)	2 (3.1%)	22.843	<0.001
	<b>Attitude level</b>					
	Positive	40 (67.8%)	15 (25.4%)	4 (6.8%)	2.091	0.351
	<b>Practices level</b>					
	Good	40 (64.5%)	18 (29%)	4 (6.5%)	0.408	0.816
Staff nurses	<b>Knowledge level</b>					
	Good	76 (56.7%)	42 (31.3%)	16 (11.9%)	1.197	0.550
	<b>Attitude level</b>					
	Positive	81 (57%)	44 (31%)	17 (12%)	1.795	0.408
	<b>Practices level</b>					
	Good	70 (57.9%)	37 (30.6%)	14 (11.6%)	0.124	0.940

**[Table/Fig-4]:** Relation between level of KAP and risk of psychological distress among F-HCWs (N=223).

The physicians 26 (57.8%) and staff nurses 35 (39.3%) who had low or no risk of psychological distress were from age <35 years [Table/Fig-5]. As per gender, majority of physicians 38 (84.4%) and staff nurses 83 (93.3%) who had no or low risk of psychological distress were male and female, respectively. More than half of the physicians 25 (55.6%) and majority of staff nurses 80 (89.9%) who had low or no risk of psychological distress were married. It was also found that risk of moderate to severe psychological distress was more among married subjects compared to unmarried subjects. More than half of the physicians 27 (60.0%) and more than two third of staff nurses 62 (69.7%), who had low or no risk of psychological distress belonged to nuclear family. All of the physicians 5 (100%) and most of the staff nurses 16 (94.1%) who had high/severe risk of psychological distress were Hindu and it was also observed that most of the staff nurses 14 (82.4%) of general category had high/severe risk of psychological distress.

[Tables/Fig-6a-c] show a prevalidated structured questionnaire consisting of 15 knowledge questions, six attitude questions, 15 practices questions and six questions on risk of psychological distress.

Caste $\chi^2=2.831$ ; p-value=0.586; $\chi^2=3.926$ ; p-value=0.416						
General	14 (31.1%)	10 (50%)	0	55 (61.8%)	33 (70.2%)	14 (82.4%)
OBC	21 (46.7%)	4 (20%)	3 (60%)	23 (25.8%)	10 (21.3%)	3 (17.6%)
SC/ST	10 (22.2%)	6 (30%)	2 (40%)	11 (12.4%)	4 (8.5%)	0
Total	45 (64.3%)	20 (28.6%)	5 (7.1%)	89 (58.2%)	47 (30.7%)	17 (11.1%)

**[Table/Fig-5]:** Relation between demographic characteristics and risk of psychological distress among F-HCWs (n=223).

Question no.	Questions	Responses (N)			
		Physicians		Staff nurses	
		Yes	No/Don't know	Yes	No/Don't know
<b>Knowledge</b>					
K1	The main clinical symptoms of COVID-19 are: 1) fever, 2) dry cough, 3) difficulty in breathing, 4) loss of taste, 5) muscle pain, and 6) fatigue.	68	2	137	16
K2	Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19.	50	20	130	23
K3	Currently there is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients to recover from the infection.	64	6	137	16
K4	Not all persons with COVID-19 will develop severe cases. Those who are elderly, have chronic illnesses, and obese are more likely to be severe cases.	62	8	125	28
K5	Keeping a minimum distance of 2 m from others is necessary.	67	3	139	14
K6	Persons with COVID-19 can spread the virus to others when the symptoms of COVID-19 are not present.	65	5	93	60
K7	The COVID-19 virus spreads via respiratory droplets and touching infected surfaces.	64	6	117	36
K8	Ordinary individuals wearing general medical face masks can be prevented by infection of the COVID-19 virus.	61	9	106	47
K9	Is it necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus?	56	14	104	49
K10	To prevent the infection by COVID-19, individuals should avoid going to crowded places and avoid gatherings.	59	11	123	30
K11	Do you know all 7 steps for proper hand washing?	62	8	123	30
K12	Test, Trace and Isolate (TT) are the effective ways to reduce the spread of COVID-19.	62	8	133	20
K13	Is it necessary to take preventive measures by vaccinated person?	42	28	112	41
K14	Is it necessary to take preventive measures by persons who already got infected?	45	25	121	32
K15	People with travel history or close contact should report themselves to health facility.	51	19	134	19
<b>Attitude</b>					
A1	Do you agree that COVID-19 will finally be successfully controlled?	56	14	108	45
A2	Do you think that COVID-19 is a threat for your community?	59	11	138	15
A3	I think that the lockdown would improve the overall wellbeing of people.	49	21	139	14
A4	Government is responsible for implementing preventive measures of COVID-19.	59	11	119	34
A5	Individuals are responsible for implementing preventive measures of COVID-19	62	8	137	16
A6	Community is responsible for implementing preventive measures of COVID-19	61	9	145	8

**[Table/Fig-6a]:** Assessment of knowledge and attitude of F-HCWs towards COVID-19.

S. No.	Practices	Responses (n)									
		Physicians					Staff nurses				
		VF	F	O	R	N	VF	F	O	R	N
P1	I wash my hands before and after taking off my clothes or do any other task.	4	66	0	0	0	96	48	9	0	0
P2	I hang my clothes separately from other clothes when I enter the house.	6	62	2	0	0	108	24	15	3	3
P3	I wear a face mask when leaving home.	54	16	0	0	0	39	48	18	25	23
P4	I carry alcohol disinfectant (sanitisers) with me.	18	52	0	0	0	93	42	6	12	0
P5	I always keep a minimum distance of 2 m from others.	54	16	0	0	0	114	33	3	3	0
P6	I always hand wash (sanitisers) when it looks dirty.	56	14	0	0	0	67	40	23	13	10
P7	I take food (meat, chicken, eggs) from neat and clean shops (places).	58	12	0	0	0	102	44	3	1	3
P8	When outside, I use my own cell phone and sanitise it regularly.	54	14	2	0	0	93	41	18	1	0
P9	I disinfect my belongings (such as, watch, pen, keyboard) regularly.	18	52	0	0	0	85	50	9	3	6
P10	I cover my mouth and nose with a tissue while sneezing and coughing.	21	45	2	2	0	95	50	8	0	0
P11	I avoid unprotected direct contact (hand shake) with animals and surfaces.	45	23	2	0	0	105	39	6	3	0
P12	I go to any crowded place.	0	0	1	18	51	2	22	19	27	83
P13	I leave the house in case I have symptoms of fever and cough.	0	0	1	17	52	0	14	17	38	84

P14	I get unprescribed drugs when there is common cold.	0	0	0	13	57	3	2	3	30	115
P15	I visit my relatives if COVID-19 infected	0	0	00	18	52	1	9	27	38	78

**[Table/Fig-6b]:** Assessment of practices of F-HCWs towards COVID-19.

VF: Very frequently; F: Frequently; O: Occasionally; R: Rarely; N: Never

Psychological distress	Frequency of feelings of psychological distress (n)									
	Physicians (n)					Staff nurses (n)				
	0	1	2	3	4	0	1	2	3	4
Feeling so sad nothing could cheer you up.	8	41	16	5	0	32	86	29	6	0
Feeling nervous	19	40	7	4	0	64	33	48	8	0
Feeling restless	21	37	11	1	0	48	67	31	7	0
Feeling hopeless	18	42	8	2	0	11	69	45	26	2
Feeling that everything was an effort.	23	26	14	7	0	53	61	31	8	0
Feeling worthless	15	33	16	6	0	55	65	26	7	0

**[Table/Fig-6c]:** Assessment of psychological distress among F-HCWs towards COVID-19.

0- None of the time  
 1- A little of the time  
 2- Some of the time  
 3- Most of the time and 4- All of the time

## DISCUSSION

In the current study, out of 223 F-HCWs (70 physicians and 153 staff nurses); more than half (52.9%) of physicians and above one third (35.9%) of staff nurses were from younger age group of 25-35 years, respectively. As per gender, majority of physicians (82.9%) were male whereas most of the staff nurses (94.1%) were female. More than half of the physicians (57.1%) and majority of staff nurses (87.6%) were married and had nuclear type of family accounting for (64.3%) and (74.5%), respectively.

In this study, overall levels of KAP of 223 F-HCWs was found to be 89.2%, 90.1% and 82.1%, respectively. Out of total subjects more than three fourth of them were assessed as 'good' where majority of physicians' and staff nurses had KAP of 92.9%, 84.3%, 88.6% and 87.6%, 92.8%, 79.1%, respectively which is in accordance with the findings of a previous study conducted by Elbqry MG et al., at Suez Canal University hospitals among 364 medical and paramedical staffs, and reported that most of them had satisfactory level of KAP as of 94.6%, 100%, 87.5% and 91.3, 94.4%, 91.7%, respectively [16]. In a similar study, conducted by Maurya VK et al.,

among 260 F-HCWs in Uttar Pradesh, reported that the knowledge (mean score: 9.77 out of 12 points), attitudes (mean score: 7.38 out of 10 points), and practices (mean score: 4.05 out of 5 points) among F-HCWs were relatively high [17].

As per the study most of the physicians (92.9%) had good level of knowledge, but they had less positive attitude (84.3%) compared to staff nurses (92.8%) and it was significantly ( $p=0.048$ ) associated with type of F-HCWs which is in accordance with the study conducted in north India by Goel N et al., among 587 F-HCWs who revealed that overall knowledge (mean: 9.71 out of 12 points) among them was on higher side and positive attitude score in paramedical staff was significantly higher (mean: 1.8 out of 4 points) as compared to junior residents (mean: 1.7 out of 4 points) and specialists (mean: 1.6 out of 4) [18]. Findings of the current study are inconsistent with the findings of a study conducted by Olum R et al., in Uganda who reported that overall mean levels of KAP among 136 HCWs were 82.4, 3.4 and 2.5, respectively where 69% and 74% HCWs had sufficient level of knowledge and practices but poor level of attitude (21%) [19]. Another web based study conducted by Bhagavathula AS et al., among 453 HCWs, globally, revealed that HCWs had insufficient knowledge about the COVID-19 pandemic but showed positive perceptions (78%) of COVID-19 transmission prevention [20]. Sample size, timing and period of study and geographical variations might be responsible for the discrepancies in the findings. Some of the similar studies have been tabulated in [Table/Fig-7] [16-22].

In the current study, majority of the physicians (64.3%) had low or no risk of psychological distress compared to staff nurses (58.2%) and the majority of physicians and staff-nurses who had 'good' level of KAP, also had low or no risk of psychological distress which was much higher than the findings of a previous study conducted at Suez Canal University hospitals (PHQ-4 scale was used) and reported that only 19.1% medical and 7.5% paramedical staff had very low level of psychological stress [16]. The findings of this study suggest that staff nurses had considerably greater levels of risk of psychological distress than physicians, which might be explained by the fact that they were in closer contact with sick patients.

Author's name and year	Place of study	Number of subject	Groups compared	Parameters assessed	Conclusion
Elbqry MG et al., 2021 [16]	Ismailia	364	Medical paramedical staffs	F-HCWs KAP	57.4% medical and 49.1% paramedical staffs had moderate COVID-19 Psychological stress levels.
Maurya VK et al., 2022 [17]	Uttar Pradesh, India	260	Faculty, Nursing technician students,	F-HCWs KAP	Adequate KAP
Goel N et al., 2021 [18]	Haryana, India	587	Specialist Junior Resident Paramedicals	KAP and Perceived mental health	Attitude towards COVID-19 was better among the paramedical staff as compared to doctors. KAP was higher among junior residents. Anxiety was more among paramedical staff.
Olum R et al., 2020 [19]	Uganda	136	Medical paramedical staffs	KAP	70% of respondents had sufficient level of knowledge.
Bhagavathula AS et al., 2020 [20]	Globally	453	Doctors medical students	Knowledge and perception	61.0% HCWs had poor knowledge of its transmission and symptom 63.6% showed positive perceptions of COVID-19.
Wang Y et al., 2020 [21]	China	4184	Nursing trainees and Medical trainees	Psychological distress and acute stress reaction	Postgraduates in medicine had higher levels of distress than their undergraduates counterparts did, whereas the nursing residents reported a lower burden than did nursing undergraduates.
Altawajri Y et al., 2022 [22]	Kingdom of Saudi Arabia	1843	HCWs	Psychological distress	Younger HCWs, women, contact with COVID-19 patients, and those who either had loved ones affected or who were themselves affected by COVID-19 were the most at-risk of psychological distress.
Present study 2021	Uttar Pradesh, India	223	Physicians staff nurses	KAP and psychological distress	Most of the physicians (92.9%) had good level of knowledge but had less positive attitude (84.3%) compare to staff nurses (92.8%). Majority of Physicians (64.3%) and staff nurses (58.2%) had no or low risk of psychological distress while only few of them had its high level.

**[Table/Fig-7]:** Previous research articles [16-22].

In this study, the prevalence of mild/moderate to high/severe risk of psychological distress among physicians and staff nurses was found to be 35.7% and 41.8%, respectively, which is nearly similar to the findings of a previous study conducted by Wang Y et al., among 4184 healthcare trainees at Sichuan University in China, and reported that 30.9% participants had clinically significant ( $k \geq 5$ ) risk of psychological distress [21]. However, a study conducted by Altwaijri Y et al., among 1843 HCWs in Saudi Arabia (used K6 scale) revealed that 80.0% of HCWs who were directly engaged ( $n=395$ ) with the care of COVID-19 patients had high prevalence rate of mild/moderate and severe psychological distress [22]. Findings of another study, which is inconsistent with the present study, revealed that 57.4% and 49.1% of medical and paramedical participants had moderate level of psychological stress and about one fourth of them had its severe form [16]. There was a significant association between COVID-19 risk of psychological distress and good level of knowledge of physicians, which is in accordance with a previous study [16]. In the current study, it was found that as age increases, the risk of mild/moderate and high level of psychological distress among F-HCWs also increases that was inconsistent to the findings of a previous study which revealed, the older age groups (40-70 years old verses 20-29 years old) had decreased odds of experiencing higher distress [22]. As per gender, female subjects (staff nurses) had higher level of moderate to high-risk of psychological distress compared to male (physicians), which is in accordance with the previous study where women were more likely than men to experience increasing psychological distress [22]. In this study, demographic characteristics of F-HCWs were not associated significantly with risk level of psychological distress, which indicates that the COVID-19 pandemic and its related national preventive policies affect the mental health of hospital workers non discriminatively.

In the current study, decreased risk of psychological distress among F-HCWs might be due to improving level of KAPs, psychological support and confidence level (after getting vaccine against COVID-19), effective communication and proper information dissemination as well as conduction of study in late phase of the pandemic when mortality and morbidity were reduced. All these conditions might have contributed to a significant difference in level of KAP and mental health of the F-HCWs.

### Limitation(s)

There were some limitations in the present study. Firstly, it was a descriptive cross-sectional survey from a single centre with small study subjects. The data did not indicate changes in psychological distress from the pre-pandemic period; rather, they characterise its trouble during second wave of COVID-19. Secondly, the response rate was low among the F-HCWs, and those who did not participate might have been with highest stress levels at work. Thirdly, it was asked only about feelings of psychological symptoms once in the late phase of the pandemic, so longitudinal studies are needed in the future, as symptoms may change over time. Fourthly, there were no more research studies that used this scale (K6) to assess the risk of psychological distress related to COVID-19 among HCWs. The generalisability of these findings to other hospitals and medical populations remains unclear and, therefore, needs more investigation.

### CONCLUSION(S)

In this study, the overall level of KAP among majority of the physicians (92.9%, 84.3%, and 88.6%, respectively) and staff nurses (87.6%, 92.8%, and 79.1%, respectively) were as 'good' regarding COVID-19 infection prevention. As for as risk of psychological distress was concerned, more than half of the physicians (64.3%) and staff nurses (58.2%) had low or no risk and only a few physicians (7.1%) and staff nurses (11.1%) had high-risk. However, improvement is

still required. Therefore, to improve the level of KAP and to reduce the risk of psychological distress among HCWs there must be conduction of educational professional programmes from time to time and continuous provision of psychological support to all of them.

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