Psychological distress and related factors regarding COVID-19 among the ancillary hospital staff: A cross-sectional study

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ABSTRACT

Background: Healthcare workers (HCWs) are at the front line of the Coronavirus disease (COVID-19) outbreak response. They have faced great risks to both physical and mental health. We aimed to assess the psychological effect of COVID-19 among ancillary hospital staff. **Methods:** A cross-sectional study was conducted among 267 on-duty ancillary hospital staff using a semi-structured questionnaire to assess their psychological status and risk perception. In addition, their knowledge, attitude, and practices (KAP) and risk perception were also assessed. The General Health Questionnaire (GHQ-12) was used to screen for psychological distress. **Results:** Among 267 participants, the mean (±SD) age was 33.5 (7.6) years. The majority knew about the symptoms of COVID-19 (88.4%), droplet spread (99.3%), and the importance of isolation (99.3%). About 35.2% were worried about infecting family members, while 26.2% were worried about colleagues at the frontline. Only 38.9% of them had a good knowledge score. Participants with high school and above education level had significantly good knowledge about COVID-19 (OR = 1.99; 95% CI = 1.17- 3.39) than those with primary school or below. Being female (OR 1.99; 95% CI 1.17-3.39) and working with COVID-19 patients (OR 3.88, 95% CI 1.77-8.47, $P = 0.001$) was associated with psychological distress. **Conclusion:** The ancillary hospital staff had insufficient knowledge regarding the risk factors of COVID-19 but possessed positive attitudes and practices. Continued health education and appropriate psychological interventions may improve understanding and reduce psychological distress.

Keywords: Ancillary hospital staff, COVID-19, healthcare workers, mental health

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Introduction

The whole world is reeling from the health, social, and economic effects of the Coronavirus disease (COVID-19) pandemic. Healthcare workers (HCWs) are at the forefront

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of the COVID-19 outbreak response. They are exposed to occupational hazards that put them at risk of contracting the COVID-19 virus. These hazards include exposure to infection, long working hours, fatigue, burnout, stigma, psychological distress, and violence.[1] They have a higher risk of contracting COVID-19 infection than the general population.[2] The World Health Organization (WHO) estimated that over 1.15 lakh HCWs had died due to COVID-19.[3] There is evidence that the actual mortality and the physical and mental morbidity among HCWs are much higher than officially reported.[3]

The HCWs have faced multiple challenges, including a novel pandemic, increasing workload, high risk of occupational exposure and violence, and insufficient supply of personal protective equipment.[4] Many studies have found that the mental health and sleep quality of HCWs have deteriorated, and they are at high risk of developing depression, anxiety, and stress.[5–9] The psychological response of the HCWs is of great importance concerning the effect of the defense against the epidemic. Information from such studies is pivotal for policymakers and program implementers during the outbreak and the recovery stages. Throughout India, the ancillary hospital staff including the sanitation, housekeeping, and security workers are at the front foot of their fight against the COVID-19 pandemic. But few studies have tried to explore the effect of the pandemic on them. This study aimed to explore the psychological effect of the COVID-19 pandemic and related factors among the ancillary hospital staff. Another objective was to assess their knowledge, attitude, and practices (KAP) and risk perception regarding the pandemic.

Methods

Study design, setting, and population

The cross-sectional study was conducted among ancillary staff working at a hospital in Chandigarh, India. Based on exposure to COVID-19, various areas in the hospital were divided into COVID-19 confirmed areas and COVID-19 suspected areas. The ancillary hospital staff working in these areas were provided boarding and lodging facilities while on duty. After the duty, a risk assessment was conducted for exposure to COVID-19. They were quarantined at a *Sarai* (inn) within the campus and a government school, nearby. Basic conveniences of water, food, laundry, bedding, and unlimited internet were provided at both quarantine facilities. Depending on risk assessment, a nasopharyngeal swab was taken during or after quarantine to test for COVID-19.

Sample size

The study was conducted among on-duty ancillary hospital staff including sanitary attendants, hospital attendants, and kitchen assistants above 18 years of age. The sample size was calculated using the following formula: $n = z^2 1 - \alpha/2\ P\ (1-P)/d^2$.[10] Considering the proportion of participants experiencing psychological issues as 39.1%[11] and precision as 0.06, the minimum required sample size was calculated to be 255, with a 95% confidence interval and a 5% type I error rate. After taking a 5% non-response rate, the final sample size was calculated as 268.

Study tools

A semi-structured questionnaire containing five sections *viz.* demographic information, needs, risk perception, KAP about COVID-19, and General Health Questionnaire (GHQ-12) was used to collect the data. The knowledge regarding symptoms, modes of transmission, risk factors, and preventive measures was assessed using a validated questionnaire that was adapted for our study.[11] A score of 1 was assigned for a correct response while an incorrect or "don't know" response was assigned as 0. Using the Bloom cut-off point, a score of ≥80% was used to characterize the knowledge of the participant as good. The perception of risk of infection, inadequate personal protective equipment, and medical violence faced by workers was assessed on a 5-point Likert scale ("strongly worried" to "not worried at all").

The short version of the GHQ-12 was used to screen the participants for any psychological distress.[12] It has 12 items, six are positively worded and six are negatively worded. Each item has four responses and is scored on a Likert scale. The standard binomial (0-0-1-1) scoring method was used to score the items,[13] similar to another study.[14] All items were added to calculate the final score which ranges from 0 to 12 with a higher score indicating more psychological distress. A score of ≥2 was considered positive for those at risk of psychological distress.[14] The questionnaire also included questions regarding their attitude and COVID-appropriate behavior.

Data collection

The study was conducted over 1 month (May to June 2020). Two staff members were trained in data collection using the questionnaire. An orientation session for the interviewers on the administration of the questionnaire was done by the investigators. The data were collected from the ancillary hospital staff residing in the quarantine facility using the Epicollect5 application.[15] It is a free mobile and web application for data collection. The participants were guided by the interviewers in downloading the application and filling out the form using their smartphones. Those participants who did not have a smartphone were given a tablet with the Epicollect5 application to fill out their forms. They were given information about the study and consent was obtained online through the Epicollect5 questionnaire. The participants with low education or those who faced any difficulty in filling out the questionnaire were facilitated by the trained staff members to complete it.

Data analysis

Data were downloaded as an Microsoft Excel comma-separated value file and cleaned and coded. It was analyzed using Statistical Package for Social Sciences (SPSS) for windows version 24.0 (SPSS Inc., Chicago, IL). The normality of data was assessed using the Shapiro–Wilk test. Descriptive statistics were conducted using

frequency and proportions for categorical variables and mean (S.D.) or median (IQR) for quantitative variables. Bivariate analyses were performed to see the association between sociodemographic variables and knowledge about COVID-19 using the Chi-square test. We conducted binary logistic regression analyses to identify the factors associated with an increased likelihood of psychological distress among the participants.

Ethical consideration

The study was approved by the Institutional Ethics Committee of PGIMER, Chandigarh. The participants were asked to participate voluntarily. The data were anonymized to conceal the identity of the participants.

Results

A total of 267 ancillary hospital workers participated in the study. The mean (± S.D.) age of the participants was 33.5 (7.65) years. The majority of them were male participants (82.8%) and married (84.3%). Most of the participants were educated up to high school (30.7%) and primary school (29.2%). The majority of them were working in hospital areas with COVID-19 patients (87.6%) while a few were working in COVID-19 suspected areas (12.4%) [Table 1]. The median (IQR) duration of stay in the quarantine facility was 13 (4) days. The needs of participants were quarantine facility-centered. The majority of them were satisfied with the quality of food, services, and arrangements. The reasons for discontent include poor taste/quality of food (n = 8) and limited supply of sanitizers (n = 2). Figure 1 summarizes the risk perception of the ancillary hospital staff regarding COVID-19. Over one-third of them were worried about their family members getting infected, and one-fourth were worried about their colleagues at the frontline. Worry regarding facing medical violence was reported by 46 (17.2%).
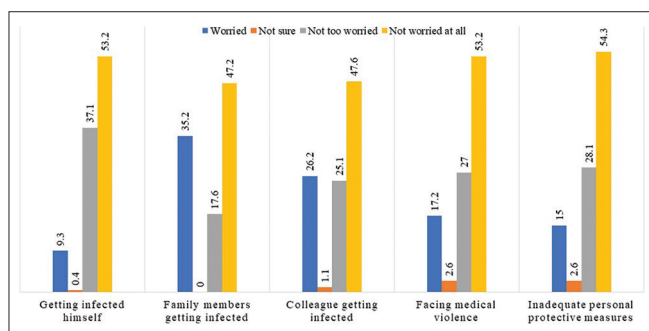
The majority of the participants knew about the symptoms of COVID-19 (88.4%), and the importance of medical masks (98.9%) and isolation (93%). Over half of the participants believed that eating wild animals causes infection. About 57% of participants thought that elderly, obese, and chronically ill people were not at risk [Table 2]. The mean (±S.D.) knowledge score was 9.32 (0.98). Only 38.9% of the participants were characterized as having a good knowledge score. The majority of them had good practices and were optimistic about India winning the battle against COVID-19. The participants with a high school certificate or above education level had twice (95% CI = 1.17-3.39) the odds of having a good knowledge score as compared to those who were educated up to the primary school level [Table 3]. Sex, age, religion, duty area, and duration of stay in the quarantine center had no significant association with the knowledge score of ancillary hospital workers.

About 42% of the ancillary hospital staff had psychological distress. The binary logistic regression model was used to identify factors associated with psychological distress among ancillary hospital workers. The Hosmer and Lemeshow test reinforced the accuracy of the logistic model (χ^2 = 8.129, df = 7, P = 0.321). The final model explained 47.7% (Nagelkerke R square) of the variability in psychological distress [Table 4]. Being female (OR 3.31, 95% CI 1.53-7.17, P = 0.002) and currently working with COVID-19 patients (OR 3.88, 95% CI 1.77-8.47, P = 0.001) was associated with psychological distress. Being concerned about medical violence (OR 12.89, 95% CI 3.67-45.29, P < 0.001) and inadequate personal protective equipment (OR 8.94, 95% CI 2.77-28.86, P < 0.001) increased the likelihood of psychological distress among the workers.

Figure 1: Risk perception of the ancillary hospital staff regarding COVID-19.

Table 1: Sociodemographic characteristics of the ancillary hospital staff (*n*=267)

Characteristic	Number (%)
Mean age (± S.D.) in years	33.5 (7.65)
Sex	
Male	221 (82.8)
Female	46 (17.2)
Education	
Illiterate	19 (7.1)
Primary school	78 (29.2)
High school	82 (30.7)
Intermediate	68 (25.5)
Graduate	20 (7.5)
Designation	
Sanitation attendant (SA)	132 (49.4)
Hospital attendant (HA)	120 (44.9)
Kitchen assistant (KA)	15 (5.6)
Marital status	
Married	225 (84.3)
Single	42 (15.7)
Family members	
1-4	101 (37.8)
5-8	130 (48.7)
>8	36 (13.5)
Religion	
Hindu	243 (91)
Sikh	21 (7.9)
Others (Muslim, Christian)	3 (1.1)
Duty area	
COVID-19 confirmed	234 (87.6)
COVID-19 suspected	33 (12.4)
Median days of stay in quarantine facility (IQR)	13 (4)

Table 2: Knowledge, attitude, and practices of ancillary hospital staff regarding COVID-19 (*n*=267)			
Knowledge	True *n* (%)	False *n* (%)	Don't know *n* (%)
The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and muscle pain	236 (88.4)	14 (5.2)	17 (6.4)
Running nose and sneezing are less common in COVID-19	11 (4.1)	236 (88.4)	17 (6.4)
Early symptomatic treatment helps in recovery	250 (93.6)	10 (3.7)	7 (2.6)
Elderly/chronic illness/obese are at risk	106 (39.7)	152 (56.9)	9 (3.4)
Eating wild animals causes infection	154 (57.7)	77 (28.8)	36 (13.5)
Afebrile patients cannot spread infection	34 (12.7)	225 (84.3)	8 (3)
Infection spreads via droplets	265 (99.3)	1 (0.4)	1 (0.4)
Medical masks prevent infection	264 (98.9)	3 (1.1)	0
Preventive measures not required for children	8 (3)	259 (97)	0
Avoid crowded places and public transport	265 (99.3)	1 (0.4)	1 (0.4)
Isolation and treatment effectively reduce spread	265 (99.3)	1 (0.4)	1 (0.4)
Contacts need immediate isolation for 14 days	265 (99.3)	1 (0.4)	1 (0.4)
	Agree	**Disagree**	**Do not know**
Attitude			
COVID-19 will be successfully controlled	260 (97.4)	1 (0.4)	6 (2.2)
Confident of India winning the battle against COVID-19	263 (98.5)	4 (1.5)	0
	Yes	**No**	**-**
Practices			
In the past 2 weeks, visited any crowded place	1 (0.4)	266 (99.6)	-
In the past 2 weeks, worn a mask while leaving the quarantine facility	265 (99.3)	2 (0.7)	-

Table 3: Factors influencing the knowledge score of study participants (*n*=267)					
Variable	Knowledge score		Chi-square	*P*	OR (95% C.I.)
	Poor	Good			
Sex			0.001	0.98	1.01 (0.53-1.94)
Male	135 (61.1)	86 (38.9)			
Female	28 (60.9)	18 (39.1)			
Age group			0.87	0.35	0.75 (0.42-1.37)
19-39 years	122 (59.5)	83 (40.5)			
40-59 years	41 (66.1)	21 (33.9)			
Education			6.52	0.01	1.99 (1.17-3.39)
Primary and below	69 (71.1)	28 (28.9)			
High school and above	94 (55.3)	76 (44.7)			
Religion			0.02	0.88	0.94 (0.39-2.22)
Hindu	148 (60.9)	95 (39.1)			
Others	15 (62.5)	9 (37.5)			
Family members			2.59	0.11	1.52 (0.91-2.51)
1-5	101 (65.2)	54 (34.8)			
6 or more	58 (55.2)	47 (44.8)			
Duty area			2.16	0.14	0.55 (0.24-1.23)
COVID-19 confirmed	139 (59.4)	95 (40.6)			
COVID-19 suspected	24 (72.7)	9 (27.3)			
Duration of stay			1.86	0.17	1.68 (0.79-3.55)
1-7 days	27 (71.1)	11 (28.9)			
8-14 days	136 (59.4)	93 (40.6)			
Currently working with cases			3.67	0.06	1.83 (0.98-3.42)
No	139 (63.8)	79 (36.2)			
Yes	24 (49)	25 (51)			

Discussion

This is the first study conducted exclusively among the ancillary hospital staff to assess the psychological impact of COVID-19 and related factors. The pandemic has enhanced the risk of mental illness among HCWs. In our study, being female was a significant predictor of psychological distress. Many studies have noted an increased risk of psychological distress, depression, and anxiety among female HCWs.[5–9,16] Jang *et al*.[6] found that female HCWs involved in managing close contacts faced more emotional

Table 4: Factors associated with psychological distress among ancillary hospital workers						
Variable	B	SE	Wald	*P*	Odds ratio	95% CI
Sex (female)	1.197	0.395	9.187	0.002	3.309	1.526-7.174
Currently working with cases	1.355	0.399	11.541	0.001	3.877	1.774-8.474
Knowledge score	0.532	0.175	9.238	0.002	1.702	1.208-2.398
Risk perception						
Concerned about getting infected him/herself	−0.445	0.693	0.414	0.520	0.641	0.165-2.490
Concerned about infecting the family members	0.694	0.398	3.035	0.082	2.002	0.917-4.369
Concerned about infecting colleagues on the frontline	−0.939	0.533	3.100	0.078	0.391	0.138-1.112
Concerned about medical violence	2.557	0.641	15.902	<0.001	12.893	3.670-45.298
Concerned about inadequate personal protective measures	2.190	0.598	13.417	<0.001	8.938	2.768-28.856

distress than their male counterparts. In Argentina, four in five HCWs developed depression and poor quality of sleep due to mandatory social isolation.[17] Caring for COVID-19 patients added to the mental health woes of the hospital staff in our study. Similar findings were observed among HCWs managing the COVID-19 patients in Iran and close contacts in Korea, respectively.[6,8] The possibility of mental health problems was higher among HCWs with low education.[8] However, the education level of the participants was not associated with their psychological status in our study. Previous studies had found that being young, single, a nurse, having less work experience, working in COVID-19 designated hospital or frontline, and having insufficient PPE were the factors associated with mental illness.[5,8,9] The HCWs may lean on alcohol and other drugs to alleviate their mental stress.[18]

Many studies have reported good knowledge among HCWs in Ethiopia (93.3%), Pakistan (93.2%), China (89%), Vietnam (88.4%), and Venezuela (76.3%).[19–24] Only four out of 10 ancillary hospital staff had good knowledge about COVID-19 in our study. Variation in knowledge among HCWs may be a reason. Most of the studies reporting good knowledge had more participation from doctors, nurses, and pharmacists.[19–23,25] While our study was conducted among ancillary hospital workers, over one-third of them were either illiterate or educated up to primary school. Rabbani *et al.*[26] observed that physicians have better knowledge regarding coronavirus disease than non-physicians. The current study results are comparable to a study conducted by Nemati *et al.*[16] who found that over half of the nurses (56.5%) had good knowledge about the symptoms, transmission, and prognosis of COVID-19. Another possible explanation may be setting up a high cut-off value for knowledge score.

Initially, there was a lack of information about the modes of spread, prevention, and treatment of Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Rapid dissemination of information ensued which was accompanied by misinformation and rumors.[27] Over half of our study participants believed that eating wild animals causes SARS-CoV-2 infection. A web-based survey involving HCWs from all over the world found that they had poor knowledge about the mode of transmission and incubation period of coronavirus.[28] In our study, half of the participants did not consider elderly, obese, and chronically ill people at risk, and 12.7% of them disagreed that afebrile

patients can spread infection. Similar gaps in knowledge have been reported by Maurya *et al.*,[25] where about 10% of HCWs disagreed over the role of asymptomatic COVID-19 patients in spreading infection.

Globally, HCWs had a positive attitude toward COVID-19 management.[20,21,28–30] More participants were confident about the country's success in the battle against COVID-19 in our study as compared to HCWs in Saudi Arabia (82%) and Uganda (79.5%).[29,30] Nearly all the participants had not visited any crowded place recently (99.6%) and wore a mask while going out (99.3%). Similar practices were reported among Chinese residents during an early stage of the COVID-19 pandemic.[11] The positive attitude and cautious practices of the staff can be attributed to the strict public health measures implemented by the government which include national lockdown, wearing face masks, social distancing, risk communication and test, trace and treat strategy, and so on.[31] The majority of the HCWs in China (85%), Vietnam (82.3%), Saudi Arabia (73%), and Venezuela (62.9%) were worried about getting infected at the workplace.[21–23,26] Compared to these studies, the ancillary staff in our study had little fear of getting infected (9.3%). They were more worried about their family members (35.2%) getting infected and their colleagues (26.2%) at the frontline. A similar fear of infecting their family and loved ones have been observed among HCWs in many studies.[16,21,22,26] Milgrom *et al.*[32] found that over half of the HCWs working at a COVID-19 treating hospital and a non-COVID-19 treating hospital in Jerusalem were worried about infecting their family members irrespective of their workplace. The HCWs have been stigmatized due to COVID-19 in both developing and developed countries. They have faced harassment, violence, eviction from their homes, and isolation from society. About 17.2% of the participants in our study were worried about facing violence at work. One of the participants was threatened by his neighbors and had to be moved to the quarantine facility due to COVID-19-related stigma in the community. Being concerned about medical violence (OR 12.89, 95% CI 3.67-45.29, *P* < 0.001) increased the likelihood of psychological distress among them.

The knowledge about COVID-19 was dependent on the educational qualification of the participants. Almohammed *et al.*[29] noted that HCWs with an associate degree had adequate knowledge (aOR 4.43; 95% CI 1.85-10.61) than those educated

up to high school. While in our study, the participants with high school and above degrees were more likely to have good knowledge (OR 1.99; 95% CI 1.17-3.39) than those who were educated up to the primary school level. Sex was a predictor of good knowledge among HCWs in Saudi Arabia and Nepal but not in our study.[24,29] In a study conducted by Kamacooko *et al.*,[30] being a clinical HCW (aRR: 1.12; 95% CI 1.02–1.23) and previous participation in health research (aRR: 1.10; 95% CI: 1.04–1.17) were predictors of sufficient knowledge.

The strength of the study was the high response rate of the participants. The illiterate participants were helped by the trained staff members to complete the questionnaire. The assessment was based on a previously published tool to assess the KAP among Chinese residents that was adapted by the researchers for local hospital staff.[11] The psychological status was assessed using a validated tool, that is, GHQ-12. The study identified a group of HCWs, that is, ancillary hospital staff with a low level of knowledge about COVID-19, and who were facing psychological problems. Timely psychological interventions including guidance and counseling may help them to deal with work pressure. The study had some limitations. A cross-sectional design was used to evaluate the psychological status of the workers during the COVID-19 pandemic which made it difficult to assess their mental health before the pandemic. It was conducted among the ancillary staff of a single hospital. The study results may not reflect the KAP of the other ancillary health staff in the country. We did not collect information regarding the use of alcohol, tobacco, and other substances among the staff. However, our study provides valuable information about the factors that need to be considered to protect the mental health of the ancillary hospital workers.

Conclusion

Appropriate and timely psychological interventions are needed to address the challenges faced by the ancillary hospital staff. Continued health education and infection control training programs can improve their knowledge. Long-term sustainable investments in the health workforce are required to recuperate the health system after the pandemic.

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Conflicts of interest
There are no conflicts of interest.

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