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Psychological impact of COVID-19 on medical interns – Findings from a nationwide survey

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Abstract:

BACKGROUND: The COVID-19 pandemic has negatively impacted the mental health of health-care workers worldwide. This study aimed to estimate the prevalence of psychological distress in medical interns during the pandemic and examine the factors influencing it.

MATERIALS AND METHODS: A cross-sectional online survey was conducted using snowball sampling among 764 medical interns across India, who were evaluated using the Kessler Psychological Distress Scale, Fear of COVID-19 Scale, and semi-structured questionnaires. Univariate analysis was done using Chi-square test, unpaired *t*-test, and ANOVA, while multivariate analysis was conducted using binary logistic regression.

RESULTS: 57.5% of the interns reported psychological distress, with 39.8% having moderate-to-severe distress. Past consultation with a mental health professional (odds ratio [OR]: 2.15; 95% confidence interval [CI]: 1.42–3.26) and perceived lack of support from friends (OR: 2.33; 95% CI: 1.33–3.99) and faculty (OR: 2.15; 95% CI: 1.41–3.28) were the most significant predictors of distress. Fear of COVID-19 was higher in interns who were female, were medically ill, were dissatisfied with the pandemic preparedness at the hospital, and perceived the faculty to be less approachable and supportive. Majority of the interns felt that the pandemic had hampered their learning and were worried about an extension to their internship and their performance in the postgraduate entrance examinations.

CONCLUSIONS: Psychological distress was highly prevalent among interns, with several workplaces and personal factors affecting the distress levels. Most interns perceived a negative impact of the pandemic on their learning and career. Addressing these issues could help alleviate the distress and bolster the mental health of interns.

Keywords:

COVID-19, medical education, mental health, psychological distress

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Introduction

The ongoing COVID-19 pandemic and ensuing lockdowns enforced by most countries have negatively impacted the mental health of the general population world over.^[1-6] This impact has been more pronounced in health-care workers (HCWs) who have had to bear the brunt of this calamity, with health-care systems across the world caught unprepared to tackle a crisis of this magnitude. The pandemic

presented a multitude of challenges to the HCWs such as long working hours, lack of adequate personal protective equipment (PPE), shortage of ventilators and intensive care unit beds to care for the surge of critically ill patients, rapidly changing treatment guidelines, ambiguity regarding effectiveness of drugs, having to stay away from their family and work in high-risk environments, to name a few. Fear of contracting and transmitting the infection to family members has also been reported as a major concern.^[7,8] Studies worldwide and in India have reported differing rates

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of anxiety, depression, stress, and insomnia in HCWs, with the prevalence ranging from 11.4% to 71.5%.^[9-13] Other symptoms indicative of psychological distress, such as repeated urges to check for information about COVID-19 and to wash hands more than required have also been reported.^[3,6] Factors such as support from family members and organizations, presence of clear protocols, and availability of PPE have been found to be protective and associated with lesser distress.^[7-9,13,14]

Medical interns have not been spared and are having to work on the frontlines alongside other HCWs. Internship is an important phase in a medical student's life, during which they acquire skills under supervision to become capable of functioning independently.^[15] In addition to adapting to a new working environment, interns also have the added pressure of preparing for competitive entrance examinations to enter postgraduate specialization courses. Internship is thus an inherently stressful period, and the high rates of depression (34%–73%), anxiety, stress, and substance use reported in interns support this assumption.^[16-18]

The pandemic is likely to exacerbate stress in interns as they will encounter most of the challenges faced by other HCWs. In addition, disruption of regular outpatient services, suspension of elective surgeries, and limitation of intern-patient interaction to curb the spread of infection during the current pandemic may have a detrimental effect on their clinical training by depriving them of the supervision they need,^[19] and hindering skill acquisition, as reported earlier during the SARS outbreak of 2003.^[20]

The psychological distress experienced by interns is likely to vary and may be influenced by several factors. In the past, internship-related factors such as longer working hours and perceived medical errors, as well as personal factors such as female gender, history of major depression, and stressful life events have been reported to be associated with higher stress levels in internship.^[21] During the current pandemic, additional factors such as working in designated COVID-19 hospitals and high-risk departments, exposure to COVID-19 patients, COVID-19 infection in friends, colleagues, and family, institutional preparedness, and available social support may also determine the level of distress in interns. Examining these factors will help us identify those at risk and address the modifiable aggravating and protective factors. In view of this, the current study aimed to estimate the prevalence of psychological distress in interns and examine the factors influencing it.

Materials and Methods

Study design and setting

A cross-sectional, online, questionnaire-based survey was conducted in the months of May and June 2020.

Study participants and sampling

The participants in the study were M. B. B. S. interns from medical colleges across India. Snowball sampling was used.

Data collection tool and technique

The questionnaire consisted of the following:

A semi-structured pro forma to collect sociodemographic data and details about internship, risk of exposure, and physical and mental health.

A semi-structured questionnaire enquiring about substance use and repetitive urges to wash hands and check for COVID-19 updates.

A 5-point Likert scale with 12 statements regarding perceived preparedness for the pandemic, perceived support, and impact on learning and career.

Kessler Psychological Distress Scale (K10)

It is a 10-item self-administered scale which measures global psychological distress over a 4-week period through questions on anxiety and depression.^[22] Frequencies of symptoms are recorded on a 5-point Likert scale. It has shown good internal consistency (Cronbach's $\alpha = 0.82$) and moderate-to-high correlation with other commonly used mental health screening questionnaires.^[23]

Fear of COVID-19 Scale

It is a 7-item scale to assess fear of COVID-19. Levels of agreement to the statements are rated on a 5-point Likert scale. The total score may range from 7 to 35, with a higher score indicating a greater fear of COVID-19.^[24]

The questionnaire was designed using Google Forms and was circulated through social media platforms and WhatsApp groups.

Ethical considerations

The study was approved by the Institutional Ethics Committee. Informed consent was sought, and the participants were asked to verify that they were currently pursuing their internship before they could begin the questionnaire.

Statistical analysis

Data were tabulated and analyzed using Statistical Package for Social Sciences, Version 25 (SPSS-25), IBM Corporation, Armonk, New York, United States of America. Data screening was done, and duplicate responses were removed. Descriptive analysis was done using mean and standard deviation for continuous variables and frequency and percentage for discrete variables. Univariate analysis to determine the factors associated with the severity of distress was done using

Chi-square test, while the comparison of FCV-19S scores between different groups was done using unpaired *t*-test and ANOVA, with Tukey's B test used for *post hoc* analysis. Statistical significance was indicated by a $P < 0.05$. Variables significantly associated with severity of distress on univariate analysis were entered into a binary logistic regression model to predict the risk associated with each of the factors.

Results

Sociodemographic characteristics

816 interns responded to the survey, out of which 52 respondents did not consent to participate in the survey. Thus, a total of 764 interns, from across 19 states and 3 union territories of India, participated in the survey, with most of them working in the state of Karnataka [Figure 1]. Majority of the respondents were female, working in a designated COVID-19

hospital in the government sector and had completed not more than 3 months of internship at the time of the survey [Table 1]. 60.6% of the interns had been predominantly staying in the hostel since the onset of the pandemic.

Internship/exposure-risk profile

Since the onset of the pandemic, 85.3% of the interns had been posted in a department with a high risk of exposure to COVID-19 [Table 1]. 88 respondents (11.5%) had been exposed to a confirmed COVID-19 positive person without adequate PPE. 25% of the interns reported that a person close to them (colleague, friends, and family) had contracted COVID-19.

Physical and mental health profile

14.5% of the interns had a chronic medical condition, with bronchial asthma and thyroid disorders being



Figure 1: Geographic distribution of the interns in the study sample (n = 764)

Table 1: Sociodemographic, internship, and risk-exposure profile (n=764)

Variables	Mean (SD) [range]/ frequency (%)
Age (years)	23.05 (1.16) [21-34]
Gender	
Male	299 (39.1)
Female	465 (60.9)
Parents working as health-care professionals*	
Yes	146 (19.1)
No	648 (80.9)
Type of hospital	
Government	424 (55.5)
Private	340 (44.5)
Designated COVID-19 hospital	
Yes	490 (64.1)
No	274 (35.9)
Months of internship completed	
3 months or less	550 (72)
>3 months	214 (28)
Main place of residence since the onset of the pandemic	
Hostel	463 (60.6)
Home with family	202 (26.5)
PG/with friends and roommates	72 (9.4)
Others (staying alone, hospital and quarantine facilities)	27 (3.5)
Posted in high-risk departments†	
Yes	652 (85.3)
No	112 (14.7)
Exposure to a COVID-19 positive case (without adequate personal protective equipment)	
Yes	88 (11.5)
No	676 (88.5)
History of quarantine and testing	
Not exposed/not quarantined or tested for COVID-19	667 (87.3)
Quarantined and/or tested for COVID-19	97 (12.7)
Tested positive for COVID-19	3 (0.4)
Has anyone close to you contracted COVID-19?	
Senior doctors/PG residents	112 (14.7)
Fellow interns	124 (16.2)
Nursing staff	44 (5.8)
Family and friends	7 (0.9)
Others (neighbors, acquaintances)	5 (0.7)
Overall	190 (24.9)
Predominant source of information regarding COVID-19	
Newspapers/TV news channels	162 (21.2)
Social media	227 (29.7)
Scientific literature	201 (26.3)
Senior colleagues/faculty	170 (22.3)
Others (family/friends)	4 (0.5)

*Doctors, dentists, AYUSH practitioners, nurses, paramedical staff, †Fever clinics, casualty/emergency department, internal medicine, pulmonary medicine, otorhinolaryngology, pediatrics, intensive care unit, COVID-19 isolation, and quarantine facilities. SD=Standard deviation

the most common [Table 2]. 17.4% of the respondents had consulted a mental health professional in the past, predominantly for symptoms suggestive of anxiety and depressive disorders. 17.1% of the interns reported a history of mental health problems in immediate family members.

Psychological distress and Fear of COVID-19

The mean total scores of K10 and FCV-19S are shown in Table 3.

More than half the interns (57.5%) reported psychological distress with 39.8% having moderate to severe distress.

Table 2: Physical and mental health profile (n=764)

Physical and mental health variables	Frequency (%)
Presence of medical condition	111 (14.5)
Bronchial asthma	48 (6.3)
Thyroid disorders	31 (4.1)
Hypertension	8 (1)
Diabetes	6 (0.8)
Immunocompromised state/on immunosuppressant medication	15 (2)
Others (Polycystic ovarian disease, allergies, irritable bowel syndrome)	24 (3.1)
Have you ever consulted a mental health professional?	
Yes	133 (17.4)
No	631 (82.6)
Past psychiatric diagnoses	
Anxiety	72 (9.4)
Depression	60 (7.9)
Obsessive Compulsive Disorder	9 (1.2)
Alcohol and other drug abuse	7 (0.9)
Are you currently on treatment for a mental health problem?	
Yes	24 (3.1)
No	692 (90.6)
Prefer not to say	48 (6.3)
Do you have an immediate family member suffering from any kind of mental health problem?	
Yes	131 (17.1)
No	633 (82.9)

Table 3: Psychological distress, fear of COVID-19, and substance use (n=764)

Psychological distress, fear of COVID-19 and substance use variables	Mean (SD) [range]/frequency (%)
Kessler Psychological Distress Scale (K10)	
Total score	23.02 (9.01) [10-50]
No distress (0-19)	325 (42.5)
Mild distress (20-24)	135 (17.7)
Moderate distress (25-29)	112 (14.7)
Severe distress (30 and above)	192 (25.1)
Fear of COVID-19 Scale (total score)	13.38 (5.96) [7-35]
I have been feeling the urge to wash my hands repeatedly/more often than required	
Strongly disagree	63 (8.2)
Disagree	170 (22.3)
Neither agree nor disagree	163 (21.3)
Agree	276 (36.1)
Strongly agree	92 (12)
I have been feeling the urge to repeatedly check the news for updates regarding COVID-19	
Strongly disagree	102 (13.4)
Disagree	182 (28.8)
Neither agree nor disagree	195 (25.5)
Agree	207 (27.1)
Strongly agree	78 (10.2)
I have increased the consumption of alcohol during the pandemic	
Yes	31 (4.1)
No	701 (91.7)
Maybe/can't say	32 (4.2)
I have increased the smoking/chewing of tobacco during the pandemic	
Yes	42 (5.5)
No	698 (91.4)
Maybe/can't say	24 (3.1)
I have increased the use of cannabis during the pandemic	
Yes	30 (4)
No	713 (93.3)
Maybe/can't say	21 (2.7)

SD=Standard deviation

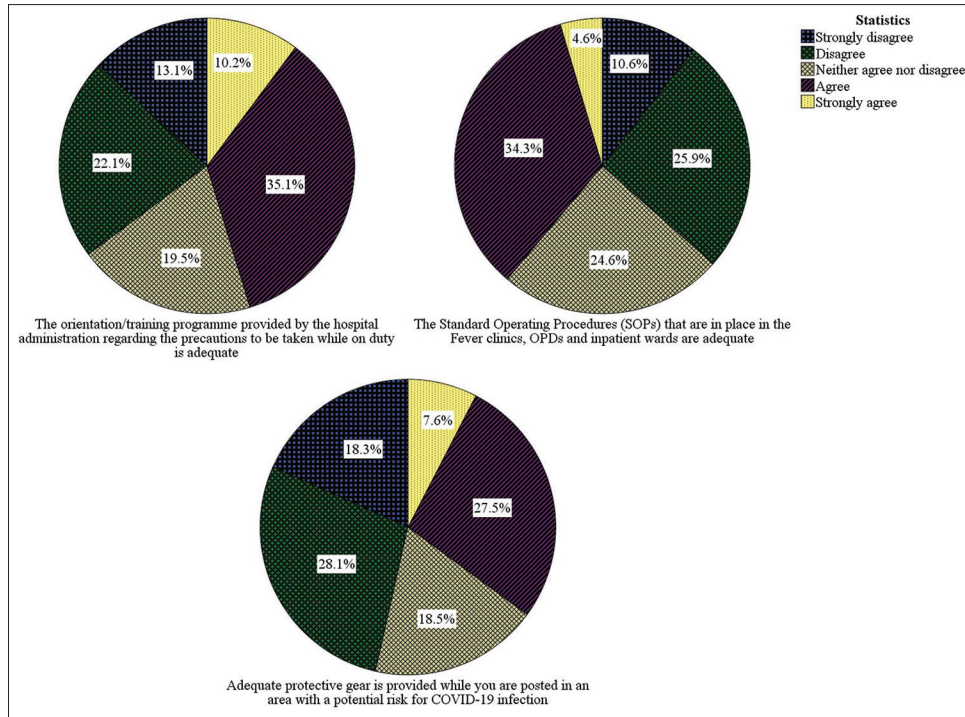


Figure 2: Perceived preparedness for the pandemic

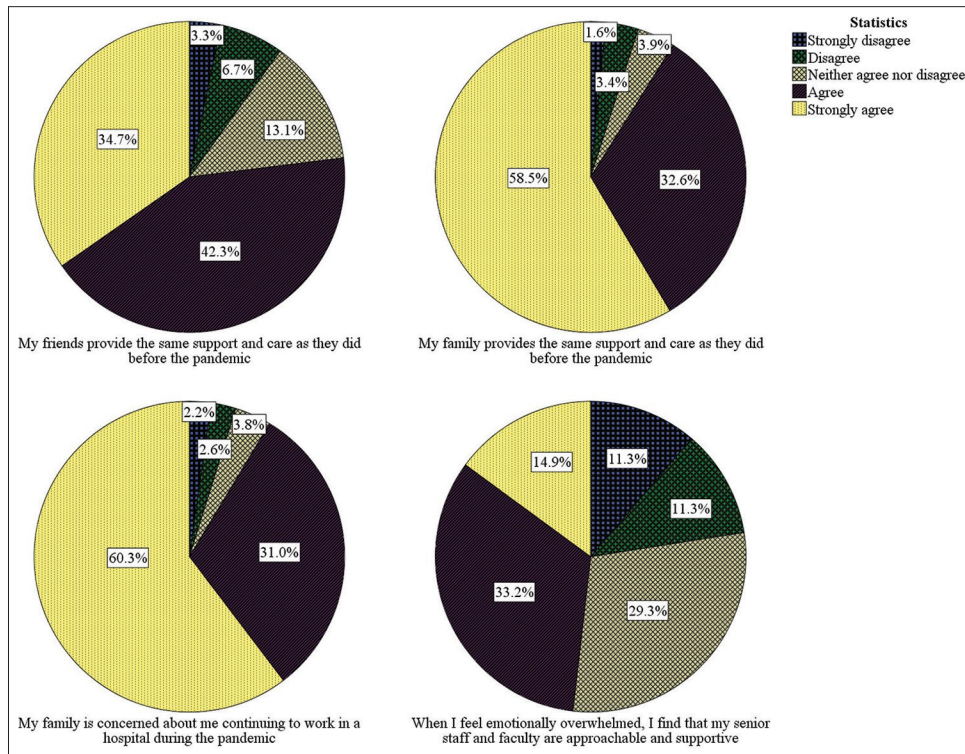


Figure 3: Perceived support

Repeated urges to wash hands and check news for COVID-19 updates were seen in 48.1% and 37.3% of the respondents, respectively. Increased smoking and alcohol use were reported by 5.5% and 4.1%, respectively.

Perceived preparedness and support

Less than half of the respondents felt the orientation and training given to them, and the standard operating procedures (SOPs) in place in the hospital were adequate [Figure 2]. 46% felt that the PPE

Table 4: Correlates of psychological distress

Variables	None to mild distress (K10<25), n (%)	Moderate to severe distress (K10>25), n (%)	χ^2	P
Sociodemographic characteristics				
Gender				
Male	201 (67.2)	98 (32.8)	10.09	0.001
Female	259 (60.2)	206 (39.8)		
Internship and exposure-risk variables				
Posted in high-risk departments				
Yes	382 (58.6)	270 (41.4)	4.88	0.027
No	78 (69.6)	34 (30.4)		
Exposure to a COVID-19 positive case without adequate PPE				
Yes	41 (46.6)	47 (53.4)	7.70	0.006
No	419 (62)	257 (38)		
Physical and mental health profile				
Presence of medical condition				
Yes	51 (45.9)	60 (54.1)	11.03	0.001
No	409 (62.6)	244 (37.4)		
Past history of consultation with a mental health professional				
Yes	52 (39.1)	81 (60.9)	29.96	0.000
No	408 (64.7)	223 (35.3)		
Family history of mental health problems				
Yes	60 (45.8)	71 (54.2)	13.70	0.000
No	400 (63.2)	233 (36.8)		
Perceived preparedness				
The SOPs that are in place in the Fever clinics, OPDs and inpatient wards are adequate				
Disagree	148 (53)	131 (47)	15.48	0.000
Neutral	108 (57.4)	80 (42.6)		
Agree	204 (68.7)	93 (31.3)		
Adequate protective gear is provided while you are posted in an area with a potential risk for COVID-19 infection				
Disagree	191 (53.8)	164 (46.2)	18.69	0.000
Neutral	80 (56.7)	61 (43.3)		
Agree	189 (70.5)	79 (29.5)		
Perceived support				
My friends provide the same support and care as they did before the pandemic				
Disagree	27 (35.5)	49 (64.5)	38.98	0.000
Neutral	44 (44)	56 (56)		
Agree	389 (66.2)	199 (33.8)		
My family provides the same support and care as they did before the pandemic				
Disagree	13 (34.2)	25 (65.8)	13.03	0.001
Neutral	15 (50)	15 (50)		
Agree	432 (62.1)	264 (37.9)		
When I feel emotionally overwhelmed, I find that my senior staff and faculty are approachable and supportive				
Disagree	72 (41.9)	100 (58.1)	39.67	0.000
Neutral	130 (58)	94 (42)		
Agree	258 (70.1)	110 (29.9)		

SOP=Standard operating procedures, OPD=Outpatient department, PPE=Personal protective equipment

provided was inadequate compared to 35.1% who were satisfied.

A vast majority of the interns felt that their friends and family continued to provide them the same care

and support as before, although 91.3% admitted that their family was concerned about them working in the hospital during the pandemic [Figure 3]. 48% of the respondents considered the senior staff and the faculty to be approachable and supportive.

Table 5: Correlates of fear of COVID-19

Variables	Fear of COVID-19			
	Mean (SD)	t/F	P	Posthoc (Tukey B)
Gender				
Male	12.76 (5.95)	-2.29	0.022	
Female	13.77 (5.94)			
Presence of medical condition				
Yes	14.82 (7.04)	2.39	0.018	
No	13.13 (5.73)			
Perceived preparedness				
The orientation/training program provided by the hospital administration regarding the precautions to be taken while on duty is adequate				
Disagree (I)	13.94 (6.38)	3.30	0.037	I>III
Neutral (II)	13.77 (6.57)			
Agree (III)	12.77 (5.27)			
The SOPs that are in place in the fever clinics, OPDs, and inpatient wards are adequate				
Disagree (I)	14.38 (6.65)	6.67	0.001	I>III
Neutral (II)	13.07 (6.08)			
Agree (III)	12.63 (5.01)			
Adequate protective gear is provided while you are posted in an area with a potential risk for COVID-19 infection				
Disagree (I)	14.04 (6.40)	4.41	0.012	I>III
Neutral (II)	13.13 (5.88)			
Agree (III)	12.63 (5.29)			
Perceived support				
When I feel emotionally overwhelmed, I find that my senior staff and faculty are approachable and supportive				
Disagree (I)	14.19 (6.56)	4.06	0.018	I>III
Neutral (II)	13.76 (6.19)			
Agree (III)	12.76 (5.46)			

SOP=Standard operating procedures, SD=Standard deviation, OPD=Outpatient department

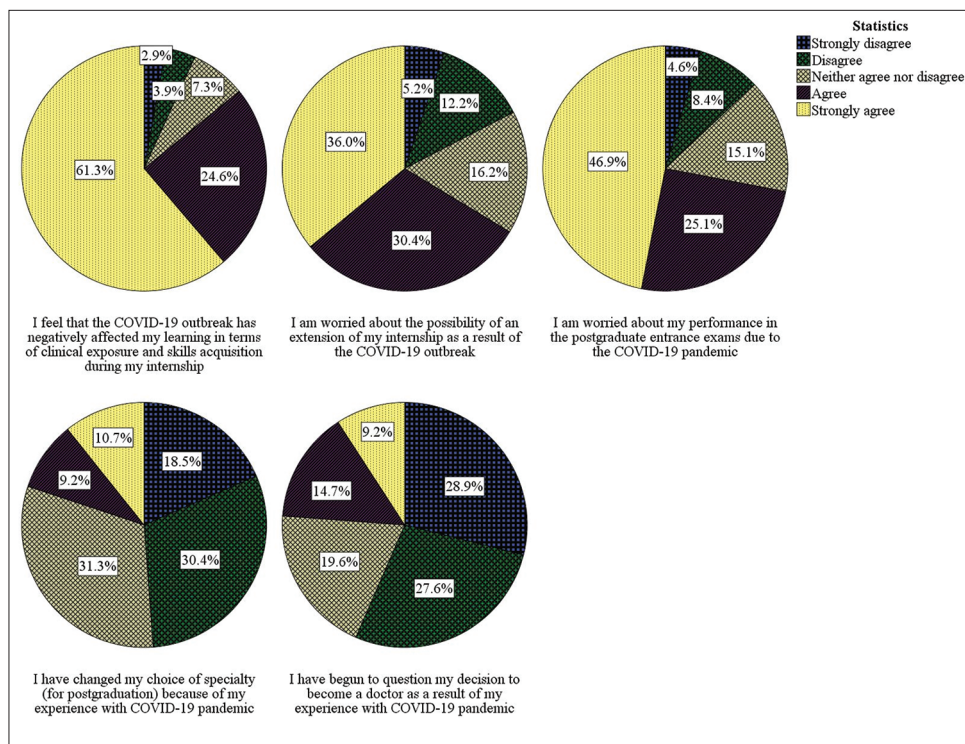


Figure 4: Impact on learning and career

Table 6: Association of psychological distress with fear of COVID-19, substance use, and impact on learning

Variables	None to mild distress (K10<25), n (%)/mean (SD)	Moderate to severe distress (K10>25), n (%)/mean (SD)	χ^2/t	P
Fear of COVID-19 total score: Mean (SD)	11.99 (4.85)	15.48 (6.82)	-7.71	0.000
I have been feeling the urge to wash my hands repeatedly/more often than required				
Disagree	162 (69.5)	71 (30.5)	12.61	0.002
Neutral	95 (58.3)	68 (41.7)		
Agree	203 (55.2)	165 (44.8)		
I have been feeling the urge to repeatedly check the news for updates regarding COVID-19				
Disagree	193 (68)	91 (32)	13.95	0.001
Neutral	117 (60)	78 (40)		
Agree	150 (52.6)	135 (47.4)		
I have increased the consumption of alcohol during the pandemic				
Disagree	434 (61.9)	267 (38.1)	10.67	0.005
Neutral	12 (37.5)	20 (62.5)		
Agree	14 (45.2)	17 (54.8)		
I have increased the smoking/chewing of tobacco during the pandemic				
Disagree	433 (62)	265 (38)	11.61	0.003
Neutral	11 (45.8)	13 (54.2)		
Agree	16 (38.1)	26 (61.9)		
Impact on learning				
I feel that the COVID-19 outbreak has negatively affected my learning in terms of clinical exposure and skills acquisition during my internship				
Disagree	41 (78.8)	11 (21.2)	8.18	0.017
Neutral	34 (60.7)	22 (39.3)		
Agree	385 (58.7)	271 (41.3)		
I am worried about the possibility of an extension of my internship as a result of the COVID-19 outbreak				
Disagree	106 (79.7)	27 (20.3)	25.78	0.000
Neutral	72 (58.1)	52 (41.9)		
Agree	282 (55.6)	225 (44.4)		
I am worried about my performance in the PG entrance exams due to the COVID-19 pandemic				
Disagree	80 (80.8)	19 (19.2)	23.93	0.000
Neutral	75 (65.2)	40 (34.8)		
Agree	305 (55.5)	245 (44.5)		
I have changed my choice of specialty (PG) because of my experience with the pandemic				
Disagree	266 (71.3)	107 (28.7)	42.39	0.000
Neutral	129 (54)	110 (46)		
Agree	65 (42.8)	87 (57.2)		
I have begun to question my decision to become a doctor as a result of my experience with COVID-19 pandemic				
Disagree	304 (70.4)	128 (29.6)	48.46	0.000
Neutral	81 (54)	69 (46)		
Agree	75 (41.2)	107 (58.8)		

SD=Standard deviation

Perceived impact on learning

85.9% of the interns felt that the pandemic had hampered their learning process [Figure 4]. 66.4% of the respondents were worried about an extension to their internship and 72% felt that their performance in the postgraduate entrance examinations will be negatively affected due to the pandemic. However, only one-fifth of the interns had changed their choice of postgraduate specialty due

to the pandemic and just 24% of the respondents doubted their decision to become a doctor.

Correlates of psychological distress and fear of COVID-19

Comparison of variables was done between interns having none or mild distress and moderate-to-severe distress [Table 4]. Association of the variables with

Table 7: Predictors of psychological distress

Variables	Adjusted OR (95% CI)	P
Female gender	1.48 (1.07-2.07)	0.019
History of postings in high-risk departments	1.67 (1.04-2.67)	0.033
Presence of medical condition	1.74 (1.12-2.73)	0.015
History of past psychiatric consultation	2.15 (1.42-3.26)	0.000
Lack of adequate protective gear	1.56 (1.05-2.32)	0.027
Perceived lack of support from friends	2.30 (1.33-3.99)	0.003
Perceived lack of support from senior staff and faculty	2.15 (1.41-3.28)	0.000

OR=Odds ratio, CI=Confidence interval

FCV-19S score was also assessed [Table 5]. Female gender and the presence of a medical condition were associated with greater fear of COVID-19 and more distress. Dissatisfaction with the SOPs and the PPE provided and perceived lack of support from senior staff and faculty were correlated with more psychological distress and fear of COVID-19

While the FCV-19S scores were higher in interns who were dissatisfied with the orientation and training provided, greater severity of distress was associated with postings in high-risk departments, exposure to COVID-19-positive patients without adequate PPE, past and family history of psychiatric problems, and lack of perceived support from friends and family.

Fear of COVID-19, repeated urge to wash hands and check news for COVID-19 updates and increased alcohol and tobacco use were associated with greater distress [Table 6]. Worries about career and doubting one's decision to become a doctor were also associated with more distress.

Multivariate analysis using binary logistic regression was done. The model was statistically significant ($\chi^2(16)=121.5$, $P < 0.001$) and explained 20% of the variance in psychological distress, with correct classification of 69% of the cases. The following factors were predictive of greater distress [Table 7]: female gender (odds ratio [OR]: 1.48; 95% confidence interval [CI]: 1.07–2.07), posting in high-risk departments (OR: 1.67; 95% CI: 1.04–2.67), presence of medical condition (OR: 1.74; 95% CI: 1.12–2.73), history of past psychiatric consultation (OR: 2.15; 95% CI: 1.42–3.26), lack of adequate PPE (OR: 1.56; 95% CI: 1.05–2.32), and perceived lack of support from friends (OR: 2.33; 95% CI: 1.33–3.99) and faculty (OR: 2.15; 95% CI: 1.41–3.28).

Discussion

In this study, we attempted to explore the psychological distress and associated factors among interns during the pandemic. Although many studies have examined the psychological impact of the pandemic among the general population and HCWs, a review of literature did not reveal similar studies among interns who are still

learning the ropes and yet, in most places, are actively involved in the detection and care of COVID-19 patients.

57.5% of interns reported psychological distress on the K10 scale, with 39.8% having moderate-to-severe distress, which is comparable to prevalence rates of distress in interns reported before the pandemic.^[17,18] The current pandemic may further aggravate this stressful milieu, as indicated by higher than average distress levels reported in HCWs during the current as well as past pandemics.^[3,12,25]

Moderate-to-severe psychological distress was associated with a greater prevalence of repeated urges to wash hands and check for COVID-19 updates. Increase in substance use during the pandemic was also associated with greater distress. Interestingly, only a small percentage of interns reported increased substance use, possibly due to restricted access due to the lockdown and the fear that substance use may weaken immunity and increase the risk of COVID-19-related complications.

Psychological distress in interns may stem from a combination of various personal and workplace factors and not just from a fear of COVID-19 illness *per se*. FCV-19S was used to assess the apprehension in interns specifically regarding COVID-19. The mean score on the FCV-19S was relatively low, although scores ranged from the minimum to the possible maximum. Previous studies have reported a high prevalence of symptoms of COVID-19-specific anxiety ranging from around 20% to just above 50% of the general population.^[2,6,26] Use of different data collection tools and lack of established cutoffs for FCV-19S make a comparison of findings between the current study and the aforementioned ones difficult. However, it was noted that FCV-19S total score was higher in those with moderate-to-severe distress, like earlier reports.^[2,24]

Various factors were associated with greater severity of psychological distress. Female interns expressed more distress and fear of COVID-19 compared to males. Similar gender difference in psychological distress has been noted in interns before the pandemic, and in HCWs during the current pandemic.^[10,12,21]

Interns who worked in high-risk departments such as emergency medicine, intensive care unit, and fever clinic since the onset of the pandemic reported more distress, like earlier findings.^[10] Curiously, working in these departments was not significantly associated with fear of COVID-19. This indicates that the distress may not be solely due to fear of the illness but also workplace factors such as long working hours and high caseload. In addition, deficiencies in imparting of requisite information and lack of a coherent structure in the hospital to deal with the pandemic have been shown to be likely to increase the psychological distress in HCWs.^[7,8] The distress is likely to be more pronounced in interns due to their inexperience and unfamiliarity with the functioning of the hospital and working in a health-care team. The findings of the current study support this assumption, with greater distress and fear of COVID-19 seen in those who were dissatisfied with the SOPs in the high-risk departments and the PPEs provided. Interns dissatisfied with the orientation provided regarding the precautions to be followed at work were also more fearful of COVID-19. Overall, more than a third of the interns were dissatisfied with the SOPs and the orientation provided, while nearly half of the interns felt the PPEs provided were inadequate. Addressing these shortcomings may help alleviate their distress and empower them to work without a constant fear of getting infected.

Comorbid medical illnesses such as diabetes mellitus, hypertension, bronchial asthma, immunocompromised states, and autoimmune conditions requiring use of immunosuppressant medications have been widely reported to increase the morbidity and mortality of COVID-19.^[27] In this study, interns suffering from one or more of these conditions reported greater fear of COVID-19 and distress, like earlier findings.^[28,29] The greater distress may also be attributable to the stress of living with a chronic illness. Interns with a history of consultation with a mental health professional in the past were twice as likely to report distress. This conforms to the oft-proven and acknowledged fact that a history of mental illness is one of the strongest predictors for the development of psychological symptoms, especially in times of upheaval like the current pandemic.^[1,21]

Interns who perceived a lack of support from friends, senior staff, and faculty were more than twice as likely to experience psychological distress, emphasizing the need for adequate social support to ensure mental well-being. FCV-19S score was higher in interns perceiving a lack of approachability and support from the faculty, which highlights the need for both institutional support and personal mentoring. Studies have revealed similar findings with higher levels of social support correlating with greater self-efficacy,

better quality of sleep, and less distress, with HCWs working in high-risk areas more likely to rate psychological support as beneficial.^[14,30]

Majority of the interns felt that the pandemic had negatively affected their learning of clinical skills, possibly due to prioritization of the management of those affected with COVID-19 with disruptions to the functioning of other departments/specialties. More than two-third of the interns were concerned about a possible delay in the completion of their internship and about their performance in the postgraduate entrance examinations. This may stem from uncertainty regarding when the examinations will be held and whether they will have enough time and energy to prepare while possibly working longer hours during the pandemic. Similar worries were expressed by students and interns during the current and past pandemics.^[20,31]

Interns with greater distress reported more worries about the negative impact on clinical skill acquisition, delay in completion of internship, and performance in postgraduate entrance examination. In addition, interns with more distress were more likely to ponder a change in their choice of postgraduate specialty and second-guess their decision to become a doctor due to the pandemic. However, only one-fifth of the interns changed their choice of specialty and less than a quarter regretted choosing to become a doctor. It is heartening to see interns embrace their professional obligation to work in these circumstances and it is vital to nurture their well-being and enthusiasm in these trying times.

This study is the first to explore the difficulties faced by the interns during the current pandemic in India, particularly in terms of its impact on clinical skill learning. Some of the notable strengths of the study are the inclusion of a large sample drawn from across the country and the examination of the role of multiple work-related and personal factors in determining the level of psychological distress endured by interns. The study has its limitations, such as the use of psychological distress as the primary response variable, instead of more commonly used constructs such as anxiety, depression, and stress. This makes a comparison of the findings with those of the past studies difficult although the high correlation of K10 with the scales measuring the other constructs ensures the comparisons are credible. Furthermore, the use of non-probability sampling technique may hinder the representativeness of the sample and lead to sample bias, calling into question the generalizability of the results to the whole intern population in India. Despite this, we believe that this study succeeds in highlighting the experiences of the interns during the pandemic and provides a platform for future research in this population.

Conclusions

Psychological distress was highly prevalent among interns. Majority of the interns expressed worries about the pandemic negatively impacting their learning process and career. Interns reporting a history of past psychiatric consultation and lack of support from friends and senior faculty were more than twice as likely to report significant distress. Female gender, presence of medical condition, working in high-risk departments, and lack of adequate PPE were also associated with greater distress. Addressing some of these factors could help bolster the mental health of the interns and enable them to cope better in these difficult times.

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Conflicts of interest

There are no conflicts of interest.

References

- Xiong J, Lipsitz O, Nasri F, Lui LM, Gill H, Phan L, *et al.* Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *J Affect Disord* 2020;277:55-64.
- Lee SA, Jobe MC, Mathis AA. Mental health characteristics associated with dysfunctional coronavirus anxiety. *Psychol Med* 2020 Apr 16:1-2. <https://doi.org/10.1017/S003329172000121X>
- Limcaoco RS, Mateos EM, Fernandez JM, Roncero C. Anxiety, worry and perceived stress in the world due to the COVID-19 pandemic, March 2020. Preliminary results. *medRxiv* [Preprint] 2020 [cited 2020 Sep 21]. [doi: 10.1101/2020.04.03.20043992].
- Zhang Y, Ma ZF. Impact of the COVID-19 pandemic on mental health and quality of life among local residents in liaoning province, China: A cross-sectional study. *Int J Environ Res Public Health* 2020;17:2381.
- Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, *et al.* Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health* 2020;17:1729.
- Grover S, Sahoo S, Mehra A, Avasthi A, Tripathi A, Subramanyan A, *et al.* Psychological impact of COVID-19 lockdown: An online survey from India. *Indian J Psychiatry* 2020;62:354-62.
- Mohindra R, Ravaki R, Suri V, Bhalla A, Singh SM. Issues relevant to mental health promotion in frontline health care providers managing quarantined/isolated COVID19 patients. *Asian J Psychiatr* 2020;51:102084.
- Cai H, Tu B, Ma J, Chen L, Fu L, Jiang Y, *et al.* Psychological impact and coping strategies of frontline medical staff in hunan between January and March 2020 during the outbreak of coronavirus disease 2019 (COVID19) in Hubei, China. *Med Sci Monit* 2020;26:e924171.
- Kang L, Ma S, Chen M, Yang J, Wang Y, Li R, *et al.* Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain Behav Immun* 2020;87:11-7.
- Lai J, Ma S, Wang Y, Cai Z, Hu J, Wei N, *et al.* Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open* 2020;3:e203976.
- Liang Y, Chen M, Zheng X, Liu J. Screening for Chinese medical staff mental health by SDS and SAS during the outbreak of COVID-19. *J Psychosom Res* 2020;133:110102.
- Wilson W, Raj JP, Rao S, Ghiya M, Nedungalaparambil NM, Mundra H, *et al.* Prevalence and Predictors of Stress, anxiety, and Depression among Healthcare Workers Managing COVID-19 Pandemic in India: A Nationwide Observational Study. *Indian J Psychol Med* 2020;42:353-8.
- Chatterjee SS, Bhattacharyya R, Bhattacharyya S, Gupta S, Das S, Banerjee BB. Attitude, practice, behavior, and mental health impact of COVID-19 on doctors. *Indian J Psychiatry* 2020;62:257-65.
- Xiao H, Zhang Y, Kong D, Li S, Yang N. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Med Sci Monit* 2020;26:e923549.
- Medical Council of India. Regulations on Graduate Medical Education, 1997 (Amended Upto May, 2018). New Delhi: Medical Council of India; 2018 [cited 2020 Sep 19]. Available from: https://www.nmc.org.in/wp-content/uploads/2017/10/GME_REGULATIONS-1.pdf.
- Chandramouleeswaran S, Edwin NC, Braganza D. Job stress, satisfaction, and coping strategies among medical interns in a South Indian tertiary hospital. *Indian J Psychol Med* 2014;36:308-11.
- Merchant H, Nayak A, Mulkalwar A. A study to assess the prevalence of depression, anxiety and stress among interns across the State of Maharashtra, India. *Indian J Ment Health* 2018;5:184-90.
- Ranjan R, Singh M, Garg V, Jiloha RC, Gupta VP, Mohapatra NC. Prevalence of Stress and its Determinants among Interns in Medical Colleges of Delhi, India. *Ann Int Med Dent Res* 2016;2:171-9.
- Rose S. Medical student education in the time of COVID-19. *JAMA* 2020;323:2131-2.
- Landis MS, Bradley JW. The impact of the 2003 SARS outbreak on medical students at the University of Toronto. *Univ Toronto Med J* 2005;82:158-64.
- Sen S, Kranzler HR, Krystal JH, Speller H, Chan G, Gelernter J, *et al.* A prospective cohort study investigating factors associated with depression during medical internship. *Arch Gen Psychiatry* 2010;67:557-65.
- Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, *et al.* Screening for serious mental illness in the general population. *Arch Gen Psychiatry* 2003;60:184-9.
- Patel V, Araya R, Chowdhary N, King M, Kirkwood B, Nayak S, *et al.* Detecting common mental disorders in primary care in India: A comparison of five screening questionnaires. *Psychol Med* 2008;38:221-8.
- Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. The fear of COVID-19 Scale: Development and initial validation. *Int J Ment Health Addict* 2020 Mar 27:1-9. <https://doi.org/10.1007/s11469-020-00270-8>
- Chua SE, Cheung V, Cheung C, McAlonan GM, Wong JW, Cheung EP, *et al.* Psychological effects of the SARS outbreak in Hong Kong on high-risk health care workers. *Can J Psychiatry* 2004;49:391-3.
- Chakraborty K, Chatterjee M. Psychological impact of COVID-19 pandemic on general population in West Bengal: A cross-sectional study. *Indian J Psychiatry* 2020;62:266-72.
- Centers for Disease Control and Prevention. People with Certain

- Medical Conditions, 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>. [Last accessed on 2020 Nov 18].
28. Alessi J, de Oliveira GB, Franco DW, Brino do Amaral B, Becker AS, Knijnik CP, *et al.* Mental health in the era of COVID-19: Prevalence of psychiatric disorders in a cohort of patients with type 1 and type 2 diabetes during the social distancing. *Diabetol Metab Syndr* 2020;12:76.
 29. Hajure M, Tariku M, Mohammedhussein M, Dule A. Depression, anxiety and associated factors among chronic medical patients amid COVID-19 pandemic in Mettu Karl Referral Hospital, Mettu, Ethiopia, 2020. *Neuropsychiatr Dis Treat* 2020;16:2511-8.
 30. Felice C, Di Tanna GL, Zanus G, Grossi U. Impact of COVID-19 outbreak on healthcare workers in Italy: Results from a National E-Survey. *J Community Health* 2020;45:675-83.
 31. Gallagher TH, Schleyer AM. "We Signed Up for This!"-Student and trainee responses to the Covid-19 pandemic. *N Engl J Med* 2020;382:e96. <https://doi.org/10.1056/NEJMp2005234>