

# Evaluating General Mental Health of Medical Interns Working at Care Units of COVID-19 Patients in Comparison with the Control

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## Abstract

**Introduction:** Starting a medical internship course is associated with major changes in social relationships and roles of students that can predispose them to mental disorders. The aim of this study was to evaluate the general health of medical interns during COVID-19 pandemic.

**Methods:** In this descriptive-analytical study, 110 medical interns (70 females and 40 males) were selected using convenience sampling method. Data collection tools were demographic survey and General Health Questionnaire (GHQ-28).

**Results:** 63.3% of the participants were female, the mean age of the students was  $25.72 \pm 1.843$  years, and single students had the highest frequency with 79.1%. There was a significant relationship between general health of medical interns and their attendance in COVID-19 ward ( $P < 0.05$ ), so that the mean score of the test for students participated in COVID-19 ward ( $36.55 \pm 15.425$ ) was significantly higher than those did not attend ( $24.16 \pm 4.969$ ). Moreover, all subscales measured in this test (physical status, anxiety, academic performance, and depression) were higher in this group than in those who were not responsible for caring for COVID-19 patients. As a result, most medical interns in charge of caring for COVID-19 patients (84.2%) showed low levels of general mental health and the remaining (15.8%) showed moderate levels.

**Discussion and Conclusion:** Caring for patients with acute pandemic diseases can lead to psychiatric and general injuries in healthcare providers, including medical interns. To prevent the long-term consequences of these injuries and to maintain work force, it is necessary to take measures to reduce the adverse effects of such disorders.

**Keywords:** General mental health • COVID-19 • Medical interns

## Introduction

The World Health Organization has defined the health as a state of complete mental, physical, and social well-being rather than merely the absence of disease and disability [1]. Health is a multidimensional concept that, in addition to patient and disability, also includes feelings of happiness and well-being [2]. According to Kaplan, mental health is the constant adaptation to changing circumstances and the striving to achieve a balance between internal contradictions and changing environmental requirements. Numerous studies have shown that mental health problems leads to dysfunction, reduced motivation, anxiety, fear and worry, causing a person to spend a significant portion of their mental energy on such problems [3]. One out of every three patients referred to the primary care unit has clinical problems related to psychiatric illness. Half of patients with depression have been identified in high-income groups and more than 50% to 75% of patients are not identified and treated [4].

In a review by Zare, et al. on 77 studies conducted on students in different fields, with a sample size of 44162 people, the overall prevalence of mental disorders in students based on the random effects model was 33.2% (0.295 to 0.371, CI: 95%). The prevalence of mental disorders among students has been increasing ( $P < 0.01$ ) [5]. In a Chinese study on the relationship between students' social anxiety and stress and mental health, women were at higher risks of stress than men [6,7]. As argued in several studies, going to university is associated with many changes in

social and human relations. Such a situation, which is often accompanied by stress and anxiety, affects people's performance and productivity and changes their relationships with family and friends [8]. It seems that the interaction between certain stressors and more importantly, the way this phenomenon is perceived, leads to stress or anxiety and sometimes depression [9]. In the current pandemic of COVID-19, those who are in contact with these patients are not immune to severe psychological and physical injuries. Coronaviruses are a large family of zoonotic viruses that cause diseases ranging from simple colds to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Acute Respiratory Syndrome (SARS-CoV) [10]. Due to direct contact and care of patients with COVID-19, medical interns suffer more stresses due to insomnia, excessive watch hours, high volume of courses and short time for study, responding patients and officials, high risk of developing COVID-19 disease to themselves and their families. It is noteworthy that general mental health is an important factor in all areas of life, including personal, social and especially professional life [11]. The medical profession is a stressful profession itself, so it seems essential to pay attention to the general and mental health status of medical interns in epidemics, including COVID-19. The aim of this study was to evaluate the general mental health of medical interns exposed to COVID-19 patients working in Shahid Beheshti University of Medical Sciences, Tehran, in comparison with those not exposed to these patients. This helps to examine the general mental health problems of medical interns to design a protocol to help improve their physical and

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mental health as well as their working conditions, and to take advantage of these capable forces to serve the health of the community and reduce the long-term effects of mental health disorders.

## Methods

This research is a descriptive-analytical study in which the study population was medical interns working at Shahid Beheshti University of Medical Sciences from 2012 to 2013.

## Sampling

This study was performed on 110 medical interns (70 females and 40 males) who were selected by convenience sampling. The inclusion criteria were incoming general doctoral students between 2012 and 2013 and satisfaction to participate in the study, and the exclusion criterion was dissatisfaction with participating in the study.

## Research Tools

The demographic survey and Goldberg General Health Questionnaire (GHQ-28) was used. The GHQ-28 was designed and developed by Goldberg and Hiller to assess general health. This 28-item questionnaire includes four components of physical status, anxiety, academic performance and depression. In his research, Dadjoo has evaluated the content validity, face validity and criterion validity of this questionnaire as appropriate. The cut-off point of this questionnaire is 23 and a higher score in this test is a sign of a lower level of general-mental health [12]. Medical interns were divided into two groups; the group that worked in the COVID-19 ward and the group that did not work in this ward. Online questionnaires were delivered to those satisfied to participate in this study. An option for satisfaction with participation in research was included in the demographic survey. Those not satisfied with the survey were excluded from the experiment.

**Table 1.** Frequency distribution of the subjects in terms of demographic variables.

Variable		Frequency	Percent
Sex	Female	70	63.6
	Male	40	36.4
Age	23-25 years	58	52.7
	Over 25 years	52	47.3
Marital status	Married	23	20.9
	Single	87	79.1
	16-30 units	32	29.1
History of attending in COVID-19 ward	Not attended	19	17.3
	Optional attending	5	4.5
	Mandatory attending	86	78.2
History of infection by COVID-19	No	64	58.2
	Yes (symptoms, without test)	31	28.2
	Yes (just with positive test)	1	0.9
	Yes (with symptoms and positive test)	14	12.7
Infection of family members during the period	No	71	64.5
	Yes (just with symptoms)	17	15.5
	Yes (with symptoms and positive test)	22	20.2
History of home quarantine	No	32	29.1
	Yes (in own home)	45	40.9
	Yes (a separate place from the family)	33	30.0
Abandoned by others	No	32	29.1
	Yes	78	70.9
The person abandons others	No	12	10.9
	Yes	98	89.1

## Results

According to Table 1, out of 110 participants in this study, 70 were female (63.3%) and 40 were male (36.7%). The mean age of the students was  $25.72 \pm 1.843$  (mean  $\pm$  standard deviation) years, more than half of them (52.7%) were in the age group of 23 years to 25 years. Single students with 79.1% have the highest frequency. 82.7% of the students worked in the COVID-19 ward. Coronavirus infection occurred in 41.8% of these interns. In 35.5% of people, their family members infected with COVID-19 during the period of exposure. Of these 35.5%, 12.7% showed symptoms of the disease and their test was positive, and the others (22.3%) only had symptoms. Nearly 71% (70.9%) of the interns surveyed had a history of house quarantine and separation from their family during the infection by the virus, of which 40.9% spent the quarantine period in their own home and 30.0% in other places.

Table 2 shows that attendance in COVID-19 ward has a significant relationship with the mean general health score of medical interns ( $p < 0.05$ ) so that the mean score of general mental health of students attended in COVID-19 ward ( $36.55 \pm 15.425$ ) was significantly higher than students who did not attend ( $24.16 \pm 4.969$ ). A higher score on this test shows a lower level of general mental health.

According to Table 3, the variables of abandoned by others and a history of psychiatric illness affected the interns in both groups (interns in charge of caring for COVID-19 patients and those not in charges). In the group of interns in charge of caring for COVID-19 patients, the variables of "a history of psychiatric illness in family" and "presence of a person with a history of immunodeficiency disease" had a more prominent effect and were significantly related to the general health of medical interns ( $p < 0.05$ ). In the group of interns not in charge of caring COVID-19 patients, in addition to variables of abandoned by others and a history of psychiatric illness, age also had a significant relationship with the general health of medical interns ( $p < 0.05$ ). In other words, the students aged between 23 years and 25 years ( $20.17 \pm 4.956$ ) had significantly lower mean general health than those over 25 years old ( $26.00 \pm 3.894$ ) (having a higher score on this test shows a lower level of general mental health.)

History of chronic physical illness	No	99	90.0
	Yes	11	10.0
History of psychiatric illness	No	96	87.3
	Yes	14	12.7
History of family psychiatric illness	No	93	84.5
	Yes	17	15.5
History of chronic drug use	No	90	81.8
	Yes	20	18.2
Presence of a person with a history of immunodeficiency disease	No	56	50.9
	Yes	54	49.1

**Table 2.** General health of medical interns in terms of being presence in the COVID-19 ward (with its components).

General health	Level	Interns in charge of caring COVID-19 patients		Interns not in charge of caring COVID-19 patients		P-value
		Frequency (%)	Mean $\pm$ standard deviation (min-max)	Frequency (%)	Mean $\pm$ standard deviation (min-max)	
Physical			9.52 $\pm$ 4.591 (1-20)		6.42 $\pm$ 1.895 (1-10)	0.001*
Anxiety			9.87 $\pm$ 5.300 (0-20)		6.16 $\pm$ 2.267 (1-9)	0.001*
Academic performance			10.13 $\pm$ 3.531 (3-20)		8.74 $\pm$ 2.104 (6-13)	0.001*
Depression			7.03 $\pm$ 5.784 (0-21)		2.84 $\pm$ 2.949 (0-13)	0.001*
Total	Low	33 (36.3)	36.55 $\pm$ 15.425 (10-75)	16 (84.2)	24.16 $\pm$ 4.969 (14-33)	0.001*
	Moderate	46 (50.5)		3 (15.8)		
	High	12 (13.2)		0 (0)		

**Note:** \*Mann-whitney test.

**Table 3.** General health of interns in terms of demographic variables.

Variable		Interns in charge of caring COVID-19 patients		Interns not in charge of caring COVID-19 patients	
		Mean $\pm$ standard deviation	P-value	Mean $\pm$ standard deviation	P-value
Sex	Female	37.90 $\pm$ 16.170	0.213*	23.56 $\pm$ 6.002	0.838*
	Male	33.80 $\pm$ 13.632		24.70 $\pm$ 4.084	
Age	23-25 years	39.31 $\pm$ 16.398	0.050*	20.17 $\pm$ 4.956	0.028*
	Over 25 years	32.87 $\pm$ 13.356		26.00 $\pm$ 3.894	
Marital status	Married	33.0 $\pm$ 15.684	0.280*	24.57 $\pm$ 4.541	0.711*
	Single	37.31 $\pm$ 15.369		23.92 $\pm$ 5.384	
History of infection by COVID-19	16-30 units	36.04 $\pm$ 15.356	0.192*	23.25 $\pm$ 7.719	0.223*
	No	34.40 $\pm$ 15.952		24.00 $\pm$ 4.873	
	Yes (symptoms, without test)	37.81 $\pm$ 15.606		-	
Infection of family members during the period	Yes (with symptoms and positive test)	41.41 $\pm$ 12.392	0.091*	-	0.553*
	No	34.00 $\pm$ 15.354		24.63 $\pm$ 4.884	
	Yes (just with symptoms)	41.60 $\pm$ 15.847		22.50 $\pm$ 7.778	
History of home quarantine	Yes (with symptoms and positive test)	39.62 $\pm$ 14.545	0.073**	-	0.100**
	No	29.67 $\pm$ 13.425		23.14 $\pm$ 4.753	
	Yes	38.79 $\pm$ 15.024		24.00 $\pm$ 3.464	
Abandoned by others	Yes (a separate place from the family)	37.52 $\pm$ 16.334	0.033*	31.50 $\pm$ 2.121	0.010*
	No	31.22 $\pm$ 15.033		21.11 $\pm$ 4.372	
The person abandons others	Yes	38.35 $\pm$ 1.848	0.592*	26.90 $\pm$ 3.843	0.781*
	No	37.86 $\pm$ 10.823		23.00 $\pm$ 5.701	
History of chronic physical illness	Yes	36.44 $\pm$ 15.792	0.111*	24.57 $\pm$ 4.847	-
	No	35.50 $\pm$ 14.776		24.16 $\pm$ 4.969	
History of psychiatric illness	Yes	44.18 $\pm$ 18.541	0.003*	-	0.047*
	No	34.66 $\pm$ 14.915		23.41 $\pm$ 4.624	
History of psychiatric illness in family	Yes	49.00 $\pm$ 13.212	0.002*	30.50 $\pm$ 3.536	0.314*
	No	34.32 $\pm$ 14.814		23.94 $\pm$ 5.023	
	Yes	47.00 $\pm$ 14.269		-	

History of chronic drug use	No	34.63 ± 13.896	0.47*	24.06 ± 4.437	0.947*
	Yes	44.33 ± 19.023		25.00 ± 11.314	
Presence of a person with a history of immunodeficiency disease	No	32.14 ± 14.958	0.005*	23.58 ± 4.738	0.432*
	Yes	40.68 ± 14.843		25.14 ± 5.581	

Note: \*Mann-whitney test/\*\*Kruskal wallis test.

## Discussion

The results of our study showed a significant relationship between the general health of medical interns and their presence in COVID-19 ward ( $p < 0.05$ ). The mean score of general mental health test of students in COVID-19 ward was significantly higher than those who did not attend in this unit. Medical interns are more prone to general mental disorders due to the high volume of contents and information, the unknown nature of emerging diseases, high workload in COVID-19 wards, insufficient sleep, and persistent dealing with illness and death, especially in pandemics. In fact, the risks associated with highly infectious diseases and high mortality, including COVID-19, are the reason for the difference in test scores between the two groups of interns [13]. The results of this study also showed that all interns in charge of caring COVID-19 patients suffered from varying degrees of general mental health disorders. This is consistent with the results of Lai's study who showed that all staff in COVID-19 ward had some degrees of general mental health disorder, insomnia, and anxiety [14].

Other significant variables affecting the general mental health of interns who were in charge of dealing with and caring for COVID-19 patients include abandoned by others, a history of psychiatric disorders in the patients and their families, and the presence of a person with a history of immunodeficiency disease. These results are consistent with the researches of Roshanzamir, et al. and Khani, et al. [15,16], in which the sources of stress reported by students included family and interpersonal relationships, job, personal, educational and environmental status, respectively. Stress reported by female students was higher in all cases than males. One of the influential factors in increasing the level of anxiety in women is the significant difference in sex hormones, which is consistent with the results of Sadock's study. The medical staff dealing with COVID-19 patients scored higher in both areas of anxiety than the hospital administrative staff. Moreover, single students received higher scores on the test compared to married students, which can be attributed to their interpersonal relationships, relationships with their families, their employment status, and the uncertainty about their employment and life status in future [17].

In the study by Foruzandeh, et al. the average score of academic stress was high among students and the quality of life score decreased by increasing stress ( $P < 0.05$ ). Academic stress can affect students' quality of life, especially in students living in dormitories who also experience a state of homesick [18]. Academic stress and quarantine, whether at home or outdoors, lead to a sense of homesickness, which, if combined with anxiety and fear of death of COVID-19 disease, can negatively affect mental health of intern. Interns caring for COVID-19 patients were frequently exposed to anxiety and stress due to the risk of COVID-19 infection to themselves and their families, which could be the cause of their deteriorating general mental health and depression [14,15]. Attention to needs, strengthening adaptation mechanisms play an important role in increasing the quality of care [19-21].

## Research Limitations

Some of limitations of this research include being limited to incoming medical students between 2012 and 2013, sending questionnaires online, lack of access to other universities due to the necessary restrictions of COVID-19, limited number of samples, and cultural and religious differences that make it difficult to explain the findings.

## Recommendations

This study was performed in the early peaks of the disease and under acute stress, so it is recommended that this study be repeated in periods of chronic stress (lasted for more than 2 years) and in the post-corona period. It is also recommended that the similar research be repeated in graduated and newly incoming medical interns and students of other disciplines dealing with COVID-19 patients.

## Conclusion

This study showed that stress induced by pandemics including COVID-19 could negatively affect the general mental health of medical interns and causes illness and poor performance in the future.

As the main custodians of the general development of the student's personality and progress during the study period, vice-chancellor's office for student should always seek to identify the factors affecting general adjustment and development of life skills in medical students who are the main assets of the country. This will improve the quality of individual and academic life of students as well as their families, reduce the risk of mental disorders and ultimately increase their mental health.

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