




Anxiety, Depression and Behavioural Changes in Junior Doctors and Medical Students Associated with the Coronavirus Pandemic: A Cross-Sectional Survey

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Abstract

Introduction Medical students are known to have high levels of depression, anxiety and stress from the high-pressure environments that they study and train in. The coronavirus pandemic presents source of stress and anxiety to large populations in general, and to healthcare professionals in particular. This study was undertaken to assess the psychological effects of this pandemic on the mental health of medical students and trainees.

Materials and Methods An online questionnaire was designed to capture information on the participant's anxieties related to the pandemic and included a validated tool for the assessment of anxiety and depression symptoms (GAD-7 and PHQ-9, respectively). The questionnaire was prepared on Google Forms, and the link to the questionnaire was disseminated to 113 medical students and junior doctors on 19 April 2020, and the survey closed on 22 April 2020 midnight.

Results The survey was sent to 113 students, and 83 students participated. Of the participants, 47 (56.6%) were female and 36 (43.4%) were male, and 80 (96.4%) were aged less than 30 years old. Formal anxiety and depression scores using the GAD-7 and PHQ-9 tools indicated 15/82 (18.3%) had anxiety scores of 0 (lowest possible) and 21/82 (25.6%) had the lowest possible depression score of 0. However, 6/82 (7.3%) had scores that were classified as severe depression. Females had significantly higher median anxiety (5 v 2, $p < 0.002$) and depression scores (5 v 3, $p = 0.025$) than male participants. Direct patient care and care of patients with Covid-19 did not result in significant deterioration in anxiety and depression.

Conclusion Female students/junior doctors showed higher anxiety and depression scores than males. Direct patient care and care of patients with Covid-19 did not result in a measurable deterioration in anxiety and depression in this study. In this stressful pandemic situation, it is imperative to look after the mental health of healthcare workers as well as patients.

Keywords Covid-19 · Anxiety · Depression · Medical students · Self-isolation

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Introduction

Pandemic infections do not just affect physical health, but the mass spread of infection can impact the mental health of affected populations from anxieties and fear related to the infection as well as restrictions to social interactions [1]. Healthcare workers are at increased risk of exposure, and therefore, the mental health impacts on these individuals may be greater [2]. The pandemic caused by the novel coronavirus detected in December 2019 in Wuhan, China, is now affecting more than 210 countries and territories, raising concerns of widespread panic and increasing anxiety in individuals subjected to the threat of the virus.

In the past, there have been global infections, e.g. Spanish flu, MERS, SARS-1, H1N1, but with the Covid-19 infection

we could be facing more of a challenge in the form of anxiety, panic, stress and depression. This could be from wider use of social media and television broadcasting which gives a minute-to-minute updates on infection spread. In addition, public health measures such as social distancing and “lockdown” may have psychological effects. The effects of the lockdown have been implicated in a rise in domestic violence giving an indication of mental health impact of the pandemic [3].

Social distancing has been practiced across the continents with its obvious epidemiological advantages, but simultaneously this can limit family and social support for the individual.

Medical trainees exhibit high levels of depression, anxiety and stress compared to general population [4]. A recent meta-analysis has shown that depression affects approximately one third of medical students worldwide [5]. This group may also have a higher exposure risk to the pandemic infection compared to the general population which may additionally lead to increased stress and worry. This study therefore was designed to explore the psychological effects of the coronavirus pandemic on the mental health of this relatively high-risk population.

Materials and Methods

The study was conducted in the form of a cross-sectional survey of medical students and junior doctors of Obstetrics and Gynaecology department enrolled and working at the Institute of Medical Sciences, Banaras Hindu University, Varanasi, in April 2020. At the time of the survey, there were: 14080 active cases, 17510 total cases, 571 deaths and 2859 recovered cases in India [6]. The survey was conducted in the form of an online composite questionnaire that was prepared on Google Forms. The participants agreed upon as they took the questionnaire survey.

The composite questionnaire comprised of two parts, Part 1 consisted of custom-designed questions that explored the concerns of coronavirus on the individuals’ health, their families’ health and the social and behavioural adaptations to the pandemic and Part 2 that consisted of two validated self-administered tools that screen for symptoms of depression—PHQ-9 and [7] Anxiety GAD-7 scale [8, 9].

The composite questionnaire was independently assessed by doctors to assess its ease of use and comprehensibility. The link to the questionnaire was sent to 113 final year medical students and junior medical doctors Obstetrics and Gynaecology on 19 April 2020 and was open until 22 April 2020 midnight.

The calculations were based on Google Form-based spreadsheets data and automated summary. Statistical calculations were performed on planetcalc online calculator.

Formal ethics approval was not possible in advance as the committee was not constituted due to lockdown. The study was initiated to ensure the well-being of students and doctors, and ethics approval was granted retrospectively.

Results

Of 113 final year medical students and Obstetrics and Gynaecology trainees who were invited to participate, 83 replies were received (response rate 73.5%).

In total, 47 (56.6%) of the participants were female and 36 (43.4%) male; 80 (96.4%) were aged less than 30 years old.

When asked, 17 respondents (20.5%) indicated that they had not changed their hand-washing behaviours over the preceding week; the remainder washed their hands and used antiseptic hand wash more frequently.

Figure 1 indicates the large number of respondents had changed their social interactions. This included 38 (45.8%) who had self-isolating completely.

Table 1 demonstrates the range of questions relating to behavioural adaptations in response to the pandemic. Among these, compared to 70 (84.3%) who had never/occasionally worried about their health 37 (44.6%) had become more worried in the preceding week. Almost all the respondents expressed concern about the health of their older relatives and only 4 (4.8%) of respondents expressed no concerns.

Only 20 respondents (24.1%) had not cancelled any plans in the past week. Outdoor events, train journeys (41%), holidays and flights (30.1%) were the most disrupted plans.

In response to strain on intimate relationships during the past week, 53 respondents (63.9%) indicated there was no problem. No respondent indicated domestic violence to be a problem; however, 17 (20.5%) preferred not to answer.

Notably 73 (88%) admitted to buying extra food.

Formal anxiety and depression scores were taken and cross-tabulated with the questions about clinical work in the last month and treatment of patients with Covid-19 (Table 2). Over the whole group, 15/82 (18.3%) had anxiety scores of 0 (lowest possible level of anxiety) and 21/82 (25.6%) had the lowest possible depression score of 0. However, 8/82 (9.8%) had anxiety scores in the moderately severe category and 0 in the severe category. From the depression score, 6/82 (7.3%) were classed as severe depression.

Females had significantly higher median anxiety (5 v 2, Mann–Whitney U $p < 0.002$) and depression scores (5 v 3, Mann–Whitney U $p = 0.025$) compared to males.

Both anxiety and depression were not associated with either working clinically or working with coronavirus infected patients (Table 2).

Fig. 1 In the past week—have you limited social interactions in any of the following ways (please tick all that apply) shown in percentage

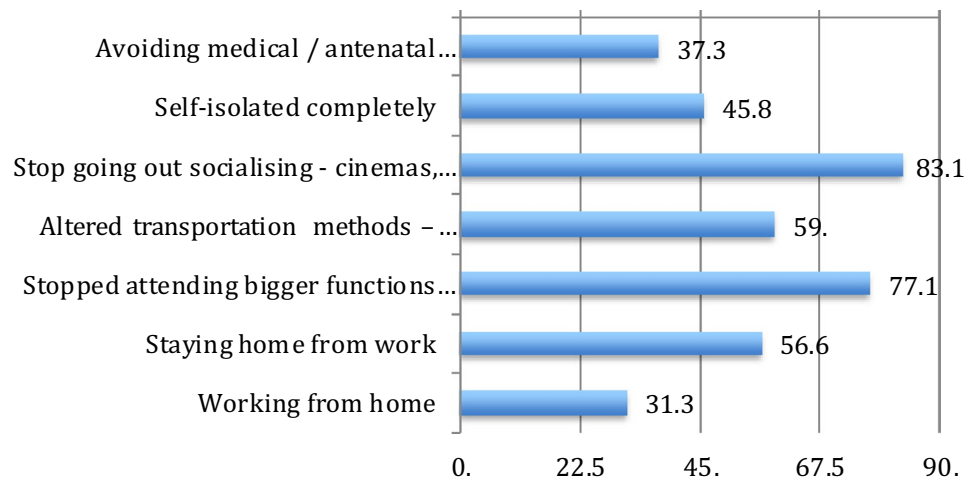


Table 1 Responses from 83 junior trainees and final year medical students to questions about health and behaviour relating to the coronavirus pandemic

Where do you get your news from	Television	58 (69.9%)
	Newspapers	26 (31.3%)
	News apps	49 (59%)
	twitter	10 (12%)
	Other	9 (10.8%)
Before the news of coronavirus, how often did you worry about your health?	Never	19 (22.9%)
	Occasionally	51 (61.4%)
	Often	12 (14.5%)
	All the time	4 (4.8%)
In the past week—have you become more/less worried about the Covid-19 risks?	More worried	37 (44.6%)
	Same worry	27 (32.5%)
	Less worried	19 (22.9%)
Have you worried about your older relatives health because of Coronavirus	No	4 (4.8%)
	Occasional	28 (33.7%)
	Often worry	37 (44.6%)
	Worry all the time	14 (16.3%)
In the last week have you cancelled any plans	Holidays	25 (30.1%)
	Flights	25 (30.1%)
	Trains	34 (41%)
	Indoor events	17 (20.5)
	Outdoor events	55 (66.3%)
	None	20 (24.1%)
Has your relationship with your partner deteriorated	No	53 (63.9%)
	Ignoring each other	4 (4.8%)
	Prefer not to answer	17 (20.5%)
	Other	9 (10.8%)

Discussion

This study reports the questionnaire results of 83 final year students and junior doctors. The background level of

personal health worry was not high, but 44.6% of respondents indicated an increased level of worry about their health due to coronavirus. The majority of students had responded positively to the pandemic, notably 77.1% stopping attending large gatherings, 83.1% stopping socialising

Table 2 Relationship of anxiety (GAD-7) and depression (PHQ-9) scores with clinical work in the last month and treating patients with covid-19
1 respondent did not complete the anxiety and depression scores

	Number (%) <i>n</i> = 83	Anxiety score Median (range) <i>n</i> = 82	Mann–Whitney <i>U</i>	Depression score Median (range) <i>n</i> = 82	Mann–Whitney <i>U</i>
Female	46 (56.6%)	5 (0–14)	<i>p</i> < 0.002	5 (0–21)	<i>p</i> = 0.025
Male	37 (43.4%)	2 (0–13)		3 (0–15)	
Worked clinically in the last month	31 (37.3%)	5 (0–13)	<i>p</i> = 0.86 (NS)	3 (0–17)	<i>p</i> = 0.83 (NS)
Not worked clinically in the last month	52 (62.7%)	3 (0–14)		4 (0–21)	
Worked with Covid patients	7 (8.4%)	3 (0–10)	<i>p</i> = 0.19 (NS)	3 (0–10)	<i>p</i> = 0.58 (NS)
Not worked with Covid patients	76 (91.6%)	3 (0–14)		4 (0–21)	

NS not significant

and 45.8% being self-isolating. Only 20 (24.1%) had not cancelled an event, gathering or travel plans. There were no recorded issues with domestic violence; however, 17 (20.5%) preferred not to answer the question about the relationship with their partner in this time period.

Although the females in the study had significantly higher levels of anxiety and depression than the males, there was no evidence that the coronavirus exposure or clinical work had led to a further increase. The combination of increased levels of health worry and no increase in anxiety and depression indicates that a successful coping mechanism and rationalisation of absolute risks were operative.

A previous study of Indian medical students using the PHQ-9 questionnaire did not find a significant male–female difference and reported that 7.6% had scores in the severely depressed range. Students in their early years had a higher prevalence, and thus, the 7.3% rate of severe depression in the current study of senior students and junior doctors is consistent [10]. It should be noted that in the current study 25.6% scored 0 on the PHQ-9 scale, the lowest score possible.

The anxiety scale indicated that 15/82 had the lowest score of 0 and 8/82 (9.8%) scored in the moderately severe category with no respondent scoring in the severe category. This result is similar to a Saudi Arabian study looking at medical students anxiety in relation to the MERS-CoV outbreak in 2014. None of the Saudi Arabian cohort scored in the severe category and 77% were classed as mildly anxious using the GAD-7 anxiety scale [11].

The coronavirus pandemic has brought into focus the rights and responsibilities of health workers as well as patients. Pandemics can lead to stigmatisation of affected patients and this trend has been seen in multiple countries and with other infectious agents [12].

It is anticipated that the effects of an infectious disease pandemic can lead to anxiety and depression. There is genuine worry among general public about getting an infection, worry about their near relatives getting infected. The absence of a definitive treatment for Coronavirus infection at the time of the survey may be the reason to exacerbate this anxiety [12].

The World Health Organization (WHO) in March 2020 published its advice for doctors in which it advised them to minimise watching, reading or listening to news about Covid-19 that causes doctors and students to feel anxious or distressed. The WHO further advised them to seek information only from trusted sources so that they can prepare personal plans and protect themselves [13].

Managing doctors mental health and psychosocial well-being during this time of Covid-19 is as important as managing physical health. It is normal to feel stressed in this situation [14, 15].

The recent addition to the Hippocratic Oath [16] allows doctors to prioritise their own health as well as that of their patient which has been ratified unanimously by the World Medical Association [17]. Sam Hazledine, a New Zealand doctor, pushed for change after noticing widespread burn-out in his profession. The way forward is to aim for a culture which focuses on healthcare professionals well-being, self-kindness and companionship and strive for this to become “the new normal” for upcoming doctors.

The Covid-19 outbreak is a unique and unprecedented scenario for many doctors, especially if they have not been involved in a similar infection, epidemic or pandemic. Hazards include pathogen exposure, long working hours; occupational and physical, fatigue, stigma, and physical and psychological violence; therefore, every experience should be counted as relevant [15].

Conclusion

In summary, the majority of medical students and Obstetrics and Gynaecology trainees had changed their behaviour related to coronavirus and around half of those surveyed had increased levels of worry and stress. The majority reported worry about their older relatives. In relation to actual mental health morbidity, only 7.3% of respondents had depression scores in the severely depressed range. Female medical

students and junior doctors demonstrated significantly higher anxiety and depression scores than males.

Direct patient care and care of patients with Covid-19 did not result in a measurable deterioration in actual anxiety and depressive symptomatology.

This survey was arguably conducted at the start of this pandemic in India and shows the initial resilience among frontline junior medical staff whilst responding to the pandemic. However, the authors recommend a follow-up study as the epidemic evolves and starts taking longer-term toll on the coping strategies.

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Author Contribution All authors contributed to the format and content of the Google Forms questionnaire. UP and SK conducted the questionnaire and results analysis. SWL assisted in the statistical analysis. UP wrote the article with editorial help from co-authors.

Compliance with Ethical Standards

Conflict of interest No conflict of interest.

Ethics Approval Formal ethics approval was not possible as the committee was not constituted and departmental committee meetings were cancelled due to lockdown. Similar studies had been authorised in Europe⁹; therefore, the study was initiated to ensure the well-being of students and doctors. Ethical approval was granted retrospectively.

Ethical Committee The consent was implied as the questionnaire filling was voluntary. Ethical committee was waiting renewal in BHU, Varanasi.

Human and Animal Rights Statement Research involving human participants and/or animals not applicable.

Informed Consent It was only online questionnaire survey.

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