Junior doctors' mental health and coronavirus disease safety concerns

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Psychosocial risk factors such as long working hours, shift work, lack of support and bullying have been associated with the development of depression, anxiety, burnout and substance dependence in doctor populations, including early-career physicians.[1-4] A systematic review among Australian doctors found that workplace risk factors of effort-reward imbalance, demands of the job and home-work conflict were associated with increased symptoms of depression, while more hours of sleep, greater job satisfaction, higher income and lower stress at work was found to be protective.[5] The early years of a doctor's career are a time of particularly elevated distress.[6,7] Educational debt, career anxiety and low professional efficacy contribute to poor mental health symptoms among junior doctors.[8,9] Symptoms of poor mental health can negatively impact physicians' workplace performance, for example, by facilitating heightened irritability towards colleagues and patients and reduced standards of care.[10,11] These findings highlight the need to detect and mitigate the deterioration of quality of life, distress and overall functioning of doctors, starting from the early career stages.

The physical and mental health consequences of the COVID-19 pandemic on healthcare workers globally have become apparent with a variety of international samples showing increases in distress, physical fatigue and burnout and symptoms of post-traumatic stress among this group.[12-16] One international study involving 1,375 American physician trainees reported that those who directly cared for patients with COVID-19 showed elevated symptoms of stress and burnout compared to those who did not.[15]

Abstract

Objective: This article aims to assess whether caring for COVID-19 patients impacted junior doctors' COVID-19-related anxieties, general anxiety and depression, and the relative impact of depression, general anxiety and specific COVID-19 anxiety on work and social functioning during the COVID-19 pandemic in 2020.

Methods: Recruitment occurred between June and August 2020 in New South Wales, Australia. Demographic information, symptoms of depression (PHQ-9), generalised anxiety (GAD-7), and COVID-19-related anxieties around infections, help-seeking behaviours, and work and social functioning (WSAS) were collected.

Results: About one third (n=73, 33%) had cared for a patient with overt or covert COVID-19 in the previous month. However, the extent of COVID-19-related anxiety symptoms was largely unrelated to caring for COVID-19 patients. Instead, the presence of other COVID-19 concerns and gender predicted variations in COVID-19 concerns for one's own safety and the safety of loved ones.

Conclusion: COVID-19 anxiety symptoms were largely unrelated to caring for COVID-19 patients, while COVID-19-related anxiety around the safety of family and friends added to impaired functioning in addition to the established impact of depression and general anxiety.

Implications for public health: Provided the replicability of these findings, this research highlights the importance of addressing pandemic-related anxieties in junior doctor populations.

Key words: work and social functioning, COVID-19, junior doctors, mental health, anxiety, depression

Emerging research further indicates that the worsening of mental health symptoms during the pandemic was greater among junior doctors than senior doctors.[17,18] COVID-19-related stressors such as worry of infection to self and others, moral injury as a result of limited resources, increased witnessing of death, high volume of patients, and disruptions to training and work schedules put considerable strain on junior doctors working through the COVID-19 pandemic during 2020.[15,18-22]

Increases in both the number and intensity of stressors can manifest in long-term experiences of posttraumatic stress, as seen in healthcare workers following previous pandemics.[13,14,23] While early intervention for mental health concerns is important, junior doctors report barriers to help-seeking including worry of being reported to medical regulators, concerns about future career progression, reluctance to become a patient themselves, and denial and shame around the issue.[13,24-26] A combination of individual risk factors, pervasive workplace stressors, and low help-seeking behaviours place doctors at particular risk for developing a mental disorder and other comorbidities[1,27] and thus may make poor work and social

adjustment more likely to occur at some point in their careers. As a result, it is important to examine whether junior doctors with more severe levels of distress were seeking professional help in a timely fashion during the COVID-19 pandemic.

Australia experienced two 'peaks' of rising COVID-19 infections in 2020; the first between March and April, and the second between July and September.[28] Until May 2021, Australia had experienced 117 COVID-19 cases per 100,000 population, significantly below the number of cases reported by the US and Russian Federation: 9,692 cases and 3,316 cases per 100,000 population, respectively.[29] A large-scale survey assessing the mental health of Australians (*N*=13,829) in April 2020 showed that those who were worried about contracting COVID-19 reported elevated levels of depression and anxiety.[30] Further research in the general Australian population (*N*=5,070) indicated that one-quarter of respondents were worried about contracting COVID-19 themselves, while half of the sample indicated being worried that their family and friends could contract COVID-19.[31] Similarly, a related survey (*N*=5,158) comparing the mental health of healthcare workers, essential workers and the general population during April 2020 showed that the possibility that loved ones could contract COVID-19 was of the highest concern across all examined groups.[32] These findings indicate that even in workplaces with an increased likelihood of exposure to COVID-19, such as in medical settings, worry is predominantly expressed with regards to keeping family and friends safe.

This study firstly examined whether Australian junior doctors who were exposed to COVID-19 in the course of their work would express greater levels of anxiety for themselves or their loved ones to contract COVID-19, and whether those who cared for patients with covert or observed COVID-19 would show increased symptoms of general anxiety and depression compared to junior doctors who did not care for such patients. Secondly, we examined whether anxieties around COVID-19 infections contributed to poor functioning in work and social settings and whether junior doctors sought psychological support for mental health problems during the pandemic. The findings of this research could help inform which organisation-level measures may be implemented to protect emerging doctors' mental and physical wellbeing during times

of heightened demands on the healthcare system such as the current pandemic context.

Method

Participants and study design

This report is part of a larger program of research aiming to develop and test the effectiveness of a novel smartphone application, *Shift*, in supporting the mental health and wellbeing of junior doctors in New South Wales (NSW), Australia. Ethical approval was sought from UNSW Sydney's Human Research Ethics Committee under protocol number HC200212. All participants included in this study provided consent for their data to be used in this research.

The New South Wales Ministry of Health and Australian Specialist Medical Colleges were approached to disseminate recruitment calls to junior medical officers via broadcast email, newsletter briefs, posters, presentations and social media. Eligibility criteria required participants to provide informed consent; be employed as a junior medical officer (intern, resident, registrar, or junior career medical officer) in New South Wales; and own an internet-enabled smartphone with an Apple or Android operating system. The website was accessed by a total of 539 candidates, of which 261 (48%) consented to participate in the study. Of those, nine failed the screening process and 33 did not complete the baseline questionnaire, resulting in a total sample size of 222 participants.

Participants completed a questionnaire between June and August 2020 that assessed basic demographic information (age, gender, level of training, area of specialty), mental health symptoms (depression and general anxiety), COVID-19-related anxieties (concerns for one's own safety and the safety of family and friends), help-seeking attitudes and behaviours (willingness to seek help for mental health concerns and actual prior help-seeking attempts), and provided a measure assessing work and social functioning.

Measures

Depression: Symptoms of depression were measured using the 9-item Patient Health Questionnaire (PHQ-9).[33] Participants were asked about the frequency of nine key symptoms of depression using a Likert-type scale ranging from 0 (not at all) to 3 (nearly every day). Total scores are calculated by summing all nine item scores, resulting in

overall scores ranging from 0 to 27. The standard cut-off score for screening to identify possible major depression is 10 or above.[34] In the present study, internal consistency for the measure was high with a Cronbach's alpha value of 0.85.

General anxiety: Symptoms of general anxiety were measured using the 7-item Generalised Anxiety Disorder Scale (GAD-7).[35] Respondents indicated on a Likert-type scale ranging from 0 (not at all) to 3 (nearly every day) their agreement with items describing common symptoms observed in general anxiety disorder. Total scores were calculated by summing all seven item scores, resulting in overall scores ranging from 0 to 21. The standard cut off score for screening to identify possible generalised anxiety disorder is 10 or above.[36] In the present study, internal consistency for the measure was high with a Cronbach's alpha value of 0.87.

COVID-19-related anxiety and contact with patients: Three COVID-19-related questions were generated by the researchers to assess how concerned participants were about their personal safety and the safety of their family and friends around contracting COVID-19, and participants' previous exposure to COVID-19. The items related to COVID-19 worries were: "How concerned or worried are you that you, personally, will catch COVID-19?" and "How concerned or worried are you that your family members or friends will catch COVID-19?" Participants responded to these items on a Likert-type scale anchored 0 (not at all) and 4 (extremely). Participants answered to the item assessing possible exposure to the virus at work ("Over the last month, have you been involved in caring for someone with observed or covert COVID-19?") using a simple 1 (yes) or 0 (no) response. For self-generated items, we reported mean scores and standard deviations of unaltered numerical Likert-type scale responses and the proportion of yes responses.

Help-seeking: Two items, modelled after the General Help-Seeking Questionnaire (GHSQ),[37] were used to assess participants willingness to seek help and past help-seeking behaviours. The original GHSQ item, "If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?" was adjusted to only assess professional help-seeking intention (i.e. "If you were having a personal or emotional problem how likely is it that you would seek help from a mental

health professional?"). Participants responded to this item on a 7-point Likert-type scale ranging from 1 (extremely unlikely) to 7 (extremely likely). Participants indicated their recent help-seeking behaviour by responding to the item: "Did you seek any help for a personal or emotional problem from a mental health professional in the past month?" with a simple 1 (yes) or 0 (no) response.

Work and Social Functioning: The 6-item Work and Social Adjustment Scale (WSAS)[38] was used to measure functional impairment in private and professional areas of life. Respondents indicated on a response scale ranging from 0 (not at all) to 8 (very severely) their perceived ability to perform in social and work domains (e.g. "Because of my problem, my ability to work is impaired"). Total scores are calculated by summing all six item scores, resulting in overall scores ranging between 0 and 48. Higher scores on the WSAS indicate greater impairment in respondents' abilities to perform in their usual capacity Scores above 10 indicate some level of functional impairment.[38] In the present study, internal consistency for the measure was high with a Cronbach's alpha value of 0.90.

Analysis strategy

We were firstly looking to examine whether participants who reported recent contact with patients presenting with observed or covert COVID-19 differed from those who reported no contact with such patients with regards to their mean levels of COVID-19-related anxieties, generalised anxiety and depressive symptoms, work and social functioning, and willingness to seek help. To answer this question, we performed independent samples *t*-tests and grouped participants by whether or not they stated they had contact with a COVID-19 patient in the previous month. We also examined whether mental health variables of depressive and general anxiety symptoms, work and social functioning, help-seeking tendencies, and demographic variables (age and gender) constituted significant predictors of COVID-19-related anxieties. By considering these variables in single prediction models using multiple linear regression analyses, we were aiming to reveal the proportion of the total variance of each COVID-19 anxiety outcome variable that could be attributed to the unique and combined contributions of the proposed predictor variables.

Secondly, we examined whether anxieties around COVID-19 negatively affected work

and social functioning over and above more general distress captured as part of the depression and generalised anxiety measures. We therefore performed a third multiple linear regression analysis to examine the relative importance of COVID-19-related anxieties, depression, generalised anxiety, willingness to seek help, and age and gender to predict variations in work and social functioning. Using G*Power 3.1,[39] power calculations indicated that a sample size of

218 was required to detect small to medium effects ($f^2 = 0.075$) with an alpha of 0.05, a power of 0.80, and nine predictor variables.

Results

Sample characteristics

Demographics and clinical characteristics of the sample (*N*=222) at baseline can be seen in Table 1. The majority of participants (*n*=156, 71%) were female and had a mean

Table 1: Sample characteristics.				
	Mean (SD)/ n (%)	**Min**	**Max**	**Cronbach's alpha**
Demographics				
Age	29.26 (4.62)	23	56	
Gender				
Female	156 (70.6%)			
Male	61 (27.6%)			
Prefer not to say	4 (1.8%)			
Level of Training				
Intern	55 (24.9%)			
Resident	50 (22.6%)			
Senior Resident	30 (13.6%)			
Registrar	85 (38.5%)			
Junior Career Medical Officer	1 (0.5%)			
Location				
Metropolitan	137 (62%)			
Regional	65 (29.4%)			
Rural	19 (8.6%)			
Specialty				
Emergency Medicine	13 (15.3%)			
General Medicine	14 (16.5%)			
Psychiatry	12 (14.1%)			
Paediatric and child Health	12 (14.1%)			
Clinical Characteristics				
Depressive Symptoms	6.84 (4.37)	0	23	0.85
None	82 (36.9%)	0	4	
Mild	87 (39.2%)	5	9	
Moderate	39 (17.6%)	10	14	
Moderately Severe	11 (5.0%)	15	19	
Severe	3 (1.4%)	20	27	
General Anxiety Symptoms	5.36 (4.06)	0	20	0.87
Minimal	113 (50.9%)	0	4	
Mild	77 (34.7%)	5	9	
Moderate	24 (10.8%)	10	14	
Severe	8 (3.6%)	15	21	
Work and Social Functioning	10.41 (7.24)	0	34	0.90
Subclinical	106 (47.7%)	0	9	
Significant functional impairment	95 (42.8%)	10	20	
Moderately severe or worse psychopathology	21 (9.5%)	21	48	
COVID-19 Anxiety				
Self	1.88 (7.13)	1	4	
Family & Friends	2.54 (1.00)	1	5	
Cared for COVID-19 Patient	73 (33%)			
Help Seeking for Mental Health Concerns				
Intention	4.06 (1.37)	1	7	
Behaviour (sought help in past month)	43 (19.5%)			

Note. N = 222

age of 29.26 years (SD=4.62). More than one-third of participants (n=85, 39%) were at the registrar level of training. One-third of the sample (n=73, 33%) indicated that they had cared for a patient with covert or overt COVID-19 in the previous month. Half of the respondents (n=110, 50%) were moderately, very, or extremely concerned for their family and friends' health around contracting COVID-19, however, only 36 (16%) expressed a similar level of concern for their own safety. No respondent was extremely concerned for their personal safety regarding the contraction of COVID-19.

About half (n=109, 49.1%) of the sample expressed symptoms indicative of possible generalised anxiety, mostly in the mild range (M=5.36, SD=4.06); however, 32 (14%) reported levels in line with moderate or severe anxiety symptoms. Although average depressive symptom scores were subclinical (M=6.84, SD=4.37), one-quarter (n=53, 24%) of participants expressed symptoms indicating possible major depression, of which 14 (6%) reported symptom levels in line with moderate or severe levels of depression. Half of the sample (n=115, 52%) reported scores indicative of functional impairment. Of those, 27 (12%) indicated symptom levels in line with moderately severe or greater impairment.[38]

Help-seeking behaviour

Mean levels of help-seeking willingness for a personal or emotional problem were around the midpoint (M=4.06, SD=1.37), indicating no clear preference for help-seeking willingness or avoidance. Upon closer inspection, about 40% of participants (n=85, 38%) expressed willingness to seek help above neutral midpoint levels and 42 (19%) had done so in the past month. More than

half of participants who reported moderate or severe symptoms of depression (8/14, 57%) and one-third of participants who reported at least moderate anxiety symptoms (11/32, 34%) indicated they had sought professional help for their mental health concerns in the past month. Help-seeking behaviour for mental health concerns in the past month was moderately and positively correlated with elevated symptoms of depression (r=0.27, p<0.001) and general anxiety (r=0.22, p=0.001).

Exploration of COVID-19-related anxiety

An independent samples t-test was performed comparing mental health, work and social functioning and help-seeking of junior doctors who had contact with COVID-19 patients in the previous month and those who did not. Levene's tests for equality of variances were all non-significant (p>0.05), indicating that homogeneity of variances could be assumed. Mean comparisons revealed no significant differences in mental health, functioning, and help-seeking variables among participants who indicated having cared for patients with a proposed coronavirus infection compared to those who did not (p>0.05 for all).

Results of a multiple linear regression analysis examining the influence of COVID-19 patient contact, mental health symptoms, functioning, help-seeking and age and gender on COVID-19 specific anxieties around doctors' own safety are presented in Table 2. The overall regression model was significant (F(9, 212)=13.81, p<0.001, R^2=0.37, Adjusted R^2=0.34), indicating the considered factors together accounted for around one-third of the variance of COVID-related anxieties for junior doctors' personal safety. COVID-19

concerns for one's family and friends (β=0.426, t=9.878, p<0.001) and male gender (β=-0.196, t=-2.509, p=0.013) were correlated with personal safety concerns. Similarly, we conducted a multiple linear regression analysis examining the influence of COVID-19 patient contact, mental health symptoms, functioning, help-seeking and age and gender on COVID-19 anxieties around safety concerns for family and friends. Results are presented in Table 3. The prediction model was significant, F(9, 212)=14.79, p<0.001, R^2=0.39, Adjusted R^2=0.36. Together, the considered factors accounted for just over one-third of the variance of junior doctors' coronavirus concerns for their family and friends. Personal COVID-19 safety concerns (β=0.740, t=9.878, p<0.001), female gender (β=0.277, t=2.695, p=0.008), and lower levels of functioning in work and social areas (β=0.024, t=2.101, p=0.037) uniquely contributed to COVID-19 concerns for family and friends.

Predictors of work and social functioning

As seen in Table 4, independent variables of mental health, COVID-19 anxiety, help-seeking, and age and gender were entered into a multiple regression model to predict work and social functioning. The overall regression model was significant, F(9, 207)=31.40, p<0.001, R^2=0.58, Adjusted R^2=0.56 and indicated that the predictors accounted for more than half of the variance of work and social functioning. Symptoms of depression (β=0.638, t=10.329, p<0.001), general anxiety (β=0.143, t=2.311, p<0.05) and participants' COVID-19-related concerns for friends and family (β=0.117, t=2.048, p<0.05) constituted unique predictors of impaired work and social functioning.

Discussion

In this article, we explored the impact of COVID-19-related anxieties on the mental health and functioning of junior doctors working during the COVID-19 pandemic in Australia in 2020. Specifically, we examined whether caring for patients with covert or overt COVID-19 contributed to specific COVID-19 anxieties around infections among doctors and whether these concerns additionally impacted work and social functioning. We further explored how many junior doctors had sought help for mental health concerns and whether symptom

Table 2: Multiple regression results for COVID-19 exposure, negative affect, help-seeking, age and gender predicting COVID-19 anxieties for one's personal safety.

Model	b	SE-b	Beta	95% CI	t	Pearson r
Constant	0.759	0.338		[0.093, 1.425]	2.247	
COV Patient Care	0.046	0.088	0.029	[-0.127, 0.220]	0.525	0.10
COVANX Family**	0.426	0.043	0.569	[0.341, 0.511]	9.878	0.58
ANX	0.012	0.014	0.065	[-0.016, 0.039]	0.856	0.14
DEP	-0.017	0.016	-0.102	[-0.049, 0.014]	-1.104	0.06
WSAS	0.007	0.009	0.072	[-0.010, 0.025]	0.855	0.16
HS Intentions	-0.007	0.033	-0.013	[-0.072, 0.058]	-0.221	0.03
HS Behaviour	0.041	0.121	0.022	[-0.197, 0.279]	0.339	0.08
Age	0.013	0.009	0.078	[-0.005, 0.031]	1.379	0.12
Gender*	-0.196	0.078	-0.142	[-0.350, -0.042]	-2.509	-0.08

Notes:
R=0.61, Adjusted R^2=0.34. COV = COVID-19; COVANX = COVID-19-related anxiety; DEP = Depressive symptoms; ANX = Anxiety symptoms; WSAS = Work and Social Adjustment; HS = Help Seeking. * p<0.05, ** p<0.01, N=222

severity was associated with increased help-seeking behaviour.

About half of the junior doctors participating in this research indicated having concerns for the safety of their family and friends, while only about one in six expressed concerns for their own safety. These findings resemble similar Australian research showing that junior doctors, healthcare workers, and the general population expressed higher levels of concern about others contracting COVID-19 than about contracting COVID-19 themselves.[30-32,40] In the present sample, caring for patients who contracted COVID-19 did not predict COVID-19-related anxieties or symptoms of common mood disorders, although one-third of junior doctors who took part in the present study were aware that they were potentially exposed to the virus at their workplace. There is conflicting evidence as to whether junior doctors who were exposed to the novel virus experienced elevated symptoms of poor mental health. Findings from India mirrored the present study's results in that direct care of COVID-19 patients did not increase junior doctors' levels of anxiety or depression when COVID-19 case numbers were still relatively low in April 2020.[41] In contrast, when COVID-19 case numbers per capita were high, junior doctors in the US who directly cared for patients with a COVID-19 diagnosis experienced elevated levels of depression, anxiety, stress and burnout.[15] We suspect that safety concerns rise with virus exposure, particularly during times of high case numbers and increased institutional strain. In Australia, hospitals were generally able to manage the uptake of patients with COVID-19 in 2020 because the virus had not impacted the country to its highest degree at this point.

Exploratory analyses revealed that male gender and existing concerns for family and friends contracting COVID-19 were predictive of concerns around personal safety. Female gender and existing personal COVID-19 safety concerns as well as lower work and social functioning were predictive of anxieties for family and friends' safety. These findings suggest that COVID-19 specific anxieties are not merely a result of generalised anxiety symptoms (such as persistent worry), but rather describe a specific anxiety that cannot be explained by the prevalence of common mental health concerns alone or by exposure to the virus. Interestingly, however, perceived low functioning in work and social domains was predictive of worries around COVID-

19-related safety of family and friends. We speculate that this could be due to doctors feeling insecure about their ability to protect their loved ones when they do not see themselves as functioning at their best, or possibly due to feeling insecure about how to undertake their roles and responsibilities both at work and home. The noted gender difference in COVID-specific concerns may be due to social norms with regards to which sentiments are deemed socially acceptable, whereby men tend to emphasise personal sentiments and women tend to emphasise relational conceptualisations.[42,43]

This study further examined the importance of depressive symptoms, general anxiety, specific COVID-19-related anxiety, and help-seeking intentions for mental health concerns in predicting Australian junior doctors' work and social functioning. During the coronavirus pandemic, mental health symptoms of depression and general anxiety remained dominant predictors of poor work and social functioning. COVID-19-related anxiety around the safety of family and

friends further contributed to functioning outcomes, suggesting that COVID-19-specific concerns uniquely contributed to impaired functioning. Help-seeking intentions, possible exposure to COVID-19 through patient contact, age and gender were not predictive of variations in work and social functioning. These findings highlight the importance of interventions that help alleviate common mental health concerns among junior doctors both in general and within a pandemic context. Effective mental health support should therefore be integrated throughout the health system, not just in those areas with high numbers of COVID-19 patients.

A number of interventions and strategies have been put forward to support the mental health and wellbeing of junior doctors.[44,45] For example, interventions aimed at providing a 'buddy system', facilitating involvement in exercise, and improving the communication of and access to wellbeing support and resources to junior doctors improved wellbeing during the COVID-19 pandemic.[44] The assignment of a wellbeing 'champion'

Table 3: Multiple regression results for COVID-19 exposure, negative affect, help-seeking, age and gender predicting covid-19 anxieties for doctors' family and friends.

Model	b	SE-*b*	Beta	95% CI	t	Pearson *r*
Constant	0.083	0.116	0.039	[-0.146, 0.311]	0.904	0.09
COV Patient Care	0.740	0.075	0.554	[0.592, 0.887]	2.048	0.58
COVANX Self**	0.010	0.018	0.041	[-0.026, 0.046]	-0.923	0.17
ANX	-0.021	0.021	-0.094	[-0.063, 0.020]	2.311	0.13
DEP	0.024	0.011	0.174	[0.001, 0.046]	10.329	0.23
WSAS*	0.013	0.044	0.019	[-0.072, 0.099]	-0.407	0.07
HS Intentions	0.079	0.159	0.032	[-0.234, 0.392]	-0.561	0.13
HS Behaviour	0.007	0.012	0.033	[-0.017, 0.031]	-1.936	0.10
Age	0.277	0.103	0.151	[0.074, 0.479]	-0.851	0.11
Gender**	-0.196	0.078	-0.142	[-0.350, -0.042]	-2.509	-0.08

Notes:

$R=0.62$, Adjusted $R^2=0.36$. COV = COVID-19; COVANX = COVID-19-related anxiety; DEP = Depressive symptoms; ANX = Anxiety symptoms; WSAS = Work and Social Adjustment; HS = Help Seeking. * $p<0.05$, ** $p<0.01$, N=222

Table 4: Multiple regression results for COVID-19 anxieties, negative affect, help-seeking, age and gender predicting work and social functioning.

Model	b	SE-*b*	Beta	95% CI	t	Pearson *r*
Constant	4.659	2.780		[-0.821, 10.138]	1.676	
COVANX Self	0.491	0.543	0.052	[-0.579, 1.560]	0.904	0.16
COVANX Family*	0.834	0.407	0.117	[0.031, 1.638]	2.048	0.23
COV Patient Care	-0.638	0.692	-0.042	[-2.001, 0.725]	-0.923	-0.01
ANX*	0.250	0.108	0.143	[0.037, 0.464]	2.311	0.57
DEP**	1.059	0.103	0.638	[0.857, 1.261]	10.329	0.74
HS Intentions	-0.106	0.261	-0.020	[-0.620, 0.408]	-0.407	0.01
HS Behaviour	-0.536	0.956	-0.029	[-2.420, 1.348]	-0.561	0.17
Age	-0.139	0.072	-0.090	[-0.281, 0.003]	-1.936	-0.03
Gender	-0.633	0.743	-0.040	[-2.098, .832]	-0.851	0.06

Notes:

$R=0.76$, Adjusted $R^2=0.56$. WSAS = Work and Social Adjustment; COVANX = COVID-19-related anxiety; COV = COVID-19; DEP = Depressive symptoms; ANX = Anxiety symptoms; HS = Help Seeking; Higher scores on the Work and Social Adjustment measure indicate greater impairment. * $p<0.05$, ** $p<0.01$, N = 222

who facilitated intervention components within a hospital setting was helpful in reducing burnout and other mental health issues among participating junior doctors.[45] While these outcomes are promising, there are a number of challenges that should be addressed to increase the likelihood of successful implementation. Inaccessibility, understaffing, limited time, exhaustion and stigma associated with seeking help for mental health problems are known barriers to implementation and uptake of such interventions.[46] Consequently, the limitations and barriers of these interventions should be considered along with junior doctors' specific needs (e.g. around preparing for exams) and the context in which they work. While doctor-centred interventions are beneficial, it is crucial for the longevity of the medical workforce that organisational psychosocial risk factors (e.g. long working hours and difficulties around calling for a consult) and barriers to help-seeking (e.g. organisational mental health stigma and unclear pathways on how to access to support), be addressed alongside intervention delivery.

About one in four of junior doctors participating in the current study reported having sought professional help for mental health concerns in the month prior to enrolling in the current research. Comparatively, a nationwide survey of Australian healthcare workers who also worked through the second 2020 wave of the COVID-19 pandemic reported similarly low rates of help-seeking (26%) from formal support services.[47] While the positive association between recent help-seeking and poor mental health symptom severity indicated that help-seeking behaviours coincided with elevated symptom severity, it is evident that a significant number of junior doctors did not seek mental health support. Known barriers to help-seeking observed in previous literature are likely contributors to this delay in support seeking.[13,24-26] This is further reflected in the relatively low rate of junior doctors' willingness to seek mental health support (38.3%) expressed in the current sample. It also needs to be noted that recent help-seeking for mental health concerns did not predict changes in work and social functioning in the current study. Future research should systematically address the role of social and professional support in restoring functioning in junior doctors.

Several limitations need to be considered when contemplating the implications of the present findings. Firstly, this research was focused on New South Wales-based junior doctors. This limits the generalisability of findings to other junior doctor populations given the vast differences in impact and response to COVID-19 between countries and regions. In this sample, few participants indicated being very worried about COVID-19. This could possibly be a result of the relatively fewer Australian infection numbers per capita as compared to other countries and therefore the ability to manage these cases in specialised units. Further limiting the generalisability of findings, a greater number of women volunteered to take to part in this research compared to men. This gender difference is common in web-based surveys[48] and among research studies involving physician samples.[49] It further needs to be noted that the demographic information collected did not include ethnicity. The reported increased risk of severe disease progression and death due to COVID-19 infections among Black, Asian and minority ethnic healthcare workers[50] makes this a limitation of the study. This study considered junior doctors more generally, with broad distinctions being made with regards to training levels. Only registrars provided further information on their specialty areas. Consequently, additional analyses to examine whether levels of disease exposure distress varied by doctors' specialty areas, for example for those specialising in emergency medicine, could not be conducted. Another limitation concerns the self-generated items employed in this study. Importantly, the items assessing COVID-19 specific anxieties were developed for the purpose of this study and were not tested prior to its use, therefore limiting the reliability of findings. Lastly, all data analyses were cross-sectional, making inferences about temporal sequences impossible. While well-validated measures of mental health symptoms were used, they cannot be considered equivalent to clinical diagnoses. Additional research is needed to determine whether the present findings are both robust and generalisable and whether higher order mediation and moderation effects help to further explain the influence of COVID-19 anxieties on functional impairment.

Implications for public health

A healthy workforce is the most crucial component of any healthcare system. Ensuring that junior doctors are mentally well and able to function at a high level is especially critical during a global pandemic. Understanding the complex interplays of work strain, private life determinants, and historical events such as the COVID-19 pandemic are pivotal in predicting the mental health of the emerging medical workforce and help uncover acceptable ways of early help-seeking among this group. Framing of the importance of mental health support around personal versus interpersonal gain for male and female doctors may aid in increasing the acceptability of an intervention message.

Our findings further suggest that novel stressors as experienced with the COVID-19 place an additional burden on doctors and that this affects functioning over and above more general mental health profiles. These stressors seemed to affect wellbeing at work as well as in private domains, with junior doctors expressing higher levels of worry about the safety of their family and loved ones compared to their own. As such, it may be advised to re-evaluate existing wellbeing programs to include crisis-related support and pandemic-preparedness measures that can ease some of these concerns. To promote mental health and wellbeing of junior doctors in a comprehensive manner, it is advised that initiatives target systemic and organisational causes of stress alongside the delivery of individual focussed interventions. In addition to addressing multiple causes of poor mental health, multi-level interventions may help steer away from pathologizing junior doctors and reduce stigma around mental health in a time of already increased pressure and stress.

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Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Figure 1: Pearson correlations between variables.