Original Article   **Open Access**

Factors Associated with Anxiety Level of Resident Doctors during The COVID-19 Pandemic

Ilma Khaerina Amaliyah Bakhtiar[1,2*], Saidah Syamsuddin[1]

[1]Department of Psychiatry, Faculty of Medicine, Universitas Hasanuddin, Makassar, Indonesia
[2]Department of Psychiatry, Faculty of Medicine, Universitas Muslim Indonesia, Makassar, Indonesia

*Corresponding Author. E-mail: ilma.khaerina@umi.ac.id Mobile number: +6285299492728

ABSTRACT

Introduction: COVID-19 is an infectious disease that first appeared in Wuhan in December 2019. Indonesia as of January 2021 has reached more than one million cases, with more than 300 doctors dying. Resident doctors of Universitas Hasanuddin continue to provide services during the pandemic so that it is vulnerable to infection and anxiety. However, there is no clear data regarding this.

Methods: Comparative research with a quantitative approach, conducted in October-December 2020 on resident doctors of Universitas Hasanuddin. A total of 399 residents filled out an anonymous questionnaire online, consisting of general data, PSS-10, and GAD-7. Data processing used Microsoft Excel and SPSS 24.0 to obtain the expected statistical results. Analysis used the chi-square test.

Results: Almost 50% of resident doctors of Universitas Hasanuddin experienced anxiety (GAD-7: 49.6% mild-severe anxiety; PSS-10: 48.4% moderate-severe stress). Psychiatric history and COVID-19 confirmed history were associated with anxiety ($p < 0.05$). Study period level and working hours also affected stress levels. Availability of personal protective equipment was associated with anxiety. Age, gender, marital status, financing, number of children, number of households, infectious work area and contact history had no effect on anxiety.

Sources of anxiety included fear of infection, availability of PPE, transmission to family, continuity of study, continuity of incentives, and uncertainty of the end of the pandemic.

Conclusion: Psychiatric history and COVID-19 diagnosis are factors associated with MPPDS anxiety during the COVID-19 pandemic.

Keywords: COVID-19; stress; anxiety; resident doctors; psychiatric history; confirmed COVID-19

Introduction

COVID-19 is an infectious disease caused by the coronavirus. The virus first emerged as an outbreak in Wuhan, China in December 2019. COVID-19 is currently a pandemic affecting various countries globally.[1] Since the announcement of the first confirmed positive case on March 2, 2020, the number of cases in Indonesia has jumped quite quickly. After experiencing a decline, as of June 2021, the growth in the number of positive COVID-19 infections has increased again.[2]

Since the determination of COVID-19 as a global pandemic by the World Health Organization (WHO) on March 11, 2020, Universitas Hasanuddin has issued a circular on Preparedness and Efforts to Prevent the Spread of COVID-19 Infection at Universitas Hasanuddin with a policy that face-to-face lectures are conducted with online learning.[3] Meanwhile, the resident doctors continue to provide services as usual at the hospital, but academic activities that involve many people are temporarily suspended.[4]

Various studies have been conducted to look at the impact of chronic illness on mental health. Studies related to the SARS pandemic found a tendency for widespread fear to cause behavioral changes in the community. During COVID-19, due to the lack of information about the disease and the need to stay at home, people may experience boredom, disappointment and irritability. The COVID-19 pandemic can also lead to social rejection, economic problems, discrimination and stigmatization.[5,6]

A cross-sectional study of 994 medical and nursing staff in Wuhan using the Patient Health Questionnaire (PHQ)-9, Generalized Anxiety Disorders (GAD)-7, the 7-item Insomnia Severity Index (ISI) and the 22-item Impact of Event Scale-Revised (IESR) found that 36.9% experienced sub-threshold symptoms of distress, 34.4% mild symptoms, 22.4% moderate symptoms, and 6.2% severe symptoms at the beginning of the pandemic. This study also found that people with mild symptoms were more likely to seek psychological support for patients and through social media while those with severe symptoms tended to seek professional help for self-support.[7]

Various stressors have been reported by health workers. Direct exposure in hospitals, death or confirmation of a relative or close person, and personal perception of the dangers of COVID-19 can affect the mental state of health workers. In areas with high exposure levels, were experiencing pressure due to excessive workload, lack of personal protective equipment (PPE), frustration at not being able to provide maximum health services and isolation. Another finding was that women were more prone to psychological disorders. [7,8,9,10]

An Italian study found that besides gender, another sociodemographic factor that can affect stress levels and psychological state is the presence of children. Health workers with children tended to have lower stress levels. Marital status had no significant effect. Meanwhile, another study found that having a cohabiting couple increased the fear of COVID-19. Economic status also had no effect, this could be due

to the perception of health workers who work without expecting rewards.[8,11]

Residents as one of the health workers who provide health services in hospitals during the COVID-19 pandemic is one of the populations that are vulnerable to stress and psychological problems. However, there is no clear data on what can cause this. There is also no monitoring system for psychological conditions or counseling for residents. Based on this, this study aims to determine the factors associated with anxiety levels in resident doctors of the Faculty of Medicine Universitas Hasanuddin during the COVID-19 pandemic.

Methods

This study is a comparative study with a quantitative approach, conducted in October-December 2020 on resident doctors of the medical faculty of Universitas Hasanuddin. 399 residents filled out an anonymous questionnaire online, consisting of general data, PSS-10 to assess stress levels, and GAD-7 to assess anxiety levels. Data processing used Microsoft Excel and SPSS 24.0 to obtain the expected statistical results. The chi-square test was used for analysis. This study has been approved for ethical clearance by the ethical committee of the Medical Faculty of Universitas Hasanuddin.

Result

Demographic Information

Table 1. Characteristic of Respondents

Characteristic	Number (N)	Percentage (%)
Age (Years)		
21-25	1	0.3
26-30	165	41.4
31-35	174	43.6
35-40	47	11.8
41-45	7	1.8
46-50	5	1.3
Sex		
Male	185	46.4
Female	214	53.6
Marital Status		
Married	266	66.7
Not Married	129	32.3
Divorced	4	1.0
Psychiatric History		
None	356	89.2
History of Access of Psychological Information/Aid	27	6.8
History of Disease or Medication	16	4.0

Characteristic	Number (N)	Percentage (%)
Number of Children		
0	167	41.9
1	108	27.1
2	81	20.3
3	38	9.5
4	4	1.0
5	1	0.3
Number of Families		
(median, SD)	3	2.6
Program Grade		
Junior	148	37.1
Intermediate	143	35.8
Senior	108	27.1
Place of Assignment		
Infection room	58	14.5
Non infection room	341	85.5
Working hours		
≤ 40 hours/weeks	160	40.1
> 40 hours/weeks	239	59.9
financing		
Independent	310	77.7
scholarship	89	22.3
Contact History		
None	44	11.0
Without PPE	21	5.3
PPE Level 1-2	216	54.1
PPE Level 3	118	29.6
Diagnosis History		
Yes	119	30.5
None	271	69.5
PPE perception		
Proper	216	54.1
Improper	183	45.9

Anxiety Levels of Resident Doctors of Universitas Hasanuddin

Table 2. Stress Levels

Stress Levels	N	%
Mild	206	51.6
Moderate	188	47.1
Severe	5	1.3

Table 3. Anxiety Levels

Anxiety Levels	N	%
Minimum/No anxiety	201	50.4
Mild	151	37.8
Moderate	29	7.3
Severe	18	4.5

In Tables 1 and 2, it can be seen that almost 50% of resident doctors of Universitas Hasanuddin experience stress and anxiety. This shows that quite a lot of residents experience stress and anxiety during the COVID-19 pandemic.

Factors Associated with Residents' Anxiety during the COVID-19 Pandemic

Table 4. Factors Associated with Residents' Anxiety during the COVID-19 Pandemic

Variables	Stress Levels (N (%))		p-value*	Anxiety Levels (N (%))			p-value*
	Mild	Moderate-Severe		Minimum/No Anxiety	Mild	Moderate-Severe	
Age (years)							
21-30	73 (44.0%)	93 (56.0%)	0.051	71 (42.8%)	74 (44.6%)	21 (12.7%)	0.160
31-35	96 (55.2%)	78 (44.8%)		95 (54.6%)	58 (33.3%)	21 (12.1%)	
35-40	29 (61.7%)	18 (38.3%)		26 (55.3%)	17 (36.2%)	4 (8.5%)	
> 40	8 (66.7%)	4 (33.3%)		9 (75.0%)	2 (16.7%)	1 (8.3%)	
Sex							
Male	100 (54.1%)	85 (45.9%)	0.367	100 (54.1%)	69 (37.3%)	16 (8.6%)	0.148
Females	106 (49.5%)	108 (50.5%)		101 (47.2%)	82 (38.3%)	31 (14.5%)	
Psychiatric History							
None	195 (54.8%)	161 (45.2%)	**0.001**	189 (53.1%)	130 (36.5%)	37 (10.4%)	**0.003**
History of Access of Psychological Information/Aid	9 (33.3%)	18 (66.7%)		7 (25.9%)	17 (63.0%)	3 (11.1%)	
History of Disease or Medication	2 (12.5%)	14 (87.5%)		5 (31.3%)	4 (25.0%)	7 (43.8%)	
Number of Children							
0	80 (47.9%)	87 (52.1%)	0.474	81 (48.5%)	69 (41.3%)	17 (10.2%)	0.455
1	56 (51.9%)	52 (48.1%)		55 (50.9%)	36 (33.3%)	17 (15.7%)	
2	44 (54.3%)	37 (45.7%)		39 (48.1%)	34 (42.0%)	8 (9.9%)	
> 2	26 (60.5%)	17 (39.5%)		26 (60.5%)	12 (27.9%)	5 (11.6%)	
Number of Families							
0	37 (50.0%)	37 (50.0%)	0.982	37 (50.0%)	27 (36.5%)	10 (13.5%)	0.815
1-3	70 (52.2%)	64 (47.8%)		74 (55.2%)	47 (35.1%)	13 (9.7%)	
3-6	78 (52.3%)	71 (47.7%)		69 (46.3%)	62 (41.6%)	18 (12.1%)	
>6	21 (50.0%)	21 (50.0%)		21 (50.0%)	15 (35.7%)	6 (14.3%)	

*Chi-square test

Various factors associated with residents' anxiety during the COVID-19 pandemic were analyzed. These factors are age, gender, psychiatric history, number of children, and number of families in the house.

In addition, factors related to studies and duties in the hospital were also assessed, namely the program stage, duty area, working hours, financing, contact history, diagnosis history, and perceptions of PPE. The results of the analysis are listed in Table 4.

Variables	Stress Levels (N (%))		p-Value*	Anxiety Levels (N (%))			p-value*
	Mild	Moderate-severe		Minimum/No Anxiety	Mild	Moderate-severe	
Program Grade							
Junior	59 (39.9%)	89 (60.1%)	**0.001**	68 (45.9%)	62 (41.9%)	18 (12.2%)	0.675
Intermediate	83 (58.0%)	60 (42.0%)		74 (51.7%)	53 (37.1%)	16 (11.2%)	
Senior	64 (59.3%)	44 (40.7%)		59 (54.6%)	36 (33.3%)	13 (12.0%)	
Duty Area							
Infectious	25 (43.1%)	33 (56.9%)	0.160	27 (46.6%)	24 (41.4%)	7 (12.1%)	0.808
Non-Infectious	181 (53.1%)	160 (46.9%)		174 (51.0%)	127 (37.2%)	40 (11.7%)	
Working Hours							
≤ 40 hours/week	96 (60.0%)	64 (40.0%)	**0.006**	89 (55.6%)	55 (34.4%)	16 (10.0%)	0.220
> 40 hours/week	110 (46.0%)	129 (54.0%)		112 (46.9%)	96 (40.2%)	31 (13.0%)	
Financing							
Private	154 (49.7%)	156 (50.3%)	0.145	157 (50.6%)	118 (38.1%)	35 (11.3%)	0.852
Scholarship	52 (58.4%)	37 (41.6%)		44 (49.4%)	33 (37.1%)	12 (13.5%)	
Contact History							
None	25 (56.8%)	19 (43.2%)	0.696	27 (61.4%)	14 (31.8%)	3 (6.8%)	0.385
Without PPE	12 (57.1%)	9 (42.9%)		8 (38.1%)	11 (52.4%)	2 (9.5%)	
PPE Level 1-2	106 (49.1%)	110 (50.9%)		100 (46.3%)	85 (39.4%)	31 (14.4%)	
PPE Level 3	63 (53.4%)	55 (46.6%)		66 (55.9%)	41 (34.7%)	11 (9.3%)	
Diagnosis History							
Yes	52 (43.7%)	67 (56.3%)	**0.034**	53 (44.5%)	44 (37.0%)	22 (18.5%)	**0.030**
None	150 (55.4%)	121 (44.6%)		143 (52.8%)	103 (38.0%)	25 (9.2%)	
PPE perception							
Proper	112 (51.9%)	104 (48.1%)	0.923	116 (53.7%)	84 (38.9%)	16 (7.4%)	**0.012**
Improper	94 (51.4%)	89 (48.6%)		85 (46.4%)	67 (36.6%)	31 (16.9%)	

Junior-grade residents tended to experience more stress and anxiety than the seniors. Residents with working hours > 40 hours/week tended to experience moderate-severe stress (p=0.006) and had anxiety (53.2%) compared to residents with working hours ≤ 40 hours/week. Another factor that also has a statistically significant relationship is the residents' perception of the availability of PPE in the hospital (p=0.012).

Discussion

Our study found that almost 50% of residents experienced anxiety (GAD-7: 49.6% mild-severe anxiety; PSS-10: 48.4% moderate-severe stress). Various studies have shown the proportion of anxiety in

health workers in the COVID-19 pandemic era. Jianbo et.al. found 44.6% of health workers experiencing anxiety in facing the COVID-19 pandemic.[9] Meanwhile, Korkmaz et al. found a prevalence of 71% anxiety (mild-severe), with 33% having clinical significance.[12]

Psychiatric history and COVID-19 diagnosis history are two factors that have a statistically significant relationship with anxiety (stress level and anxiety level). Asmundson et al, mentioned that people with a history of anxiety disorders and affective disorders showed higher symptoms of COVID-19-related stress and fear compared to those without a history. Specifically, people with a history of anxiety disorders were most vulnerable to experiencing COVID-19-related stress and anxiety.[13] Several studies examined the impact of coronavirus infection on mental health. A meta-analysis study found that there was an increased incidence of depression, anxiety, PTSD, and other mental disorders following SARS, MERS, and SARS-COV2 infections.[14]

In our study, it was found that junior residents tended to experience more stress than senior. There were also more junior residents (54.1%) who experienced anxiety compared to intermediate (48.3%) and senior residents (45.3%) although not statistically significant. This is in line with research on medical students in Saudi Arabia and Ethiopia, where stress levels were higher in the early years of study. This is said to be related to students in the early years facing something new, separating from family, and over time developing adaptation skills.[15,16] Different things were found in the study of Collins et.al. where senior residents in the surgical department were more likely to have higher GAD-7 scores than juniors.[17]

Working hours and availability of personal protective equipment also affect stress and anxiety levels. High workload has been known to be one of the stressors for health workers.[7,9,10,18] China focuses on one of the concerns for health workers to provide personal protective equipment, separate living quarters.[7] This is also true in studies in India, and specifically in studies of residents from various departments/sections in the world.[17,18]

Age, gender, financing, number of children, and number of families living in the same house did not significantly affect anxiety. Working in an infectious area and having a history of contact with confirmed/suspected COVID-19 patients also had no effect on anxiety. Various studies have reported mixed results on these factors. The different results in this study can be concluded that although the presence of children and cohabiting families is an influential factor in anxiety, the number of children and the number of families living in the same house is not a significant influential factor. It is necessary to elaborate further on the social support of the family, as well as the presence of risk factors in the family living in the same house. This may also be related to the results of a study of residents working with COVID-19 patients in the United States where residents also tended to find it difficult to engage with the care of their children, and difficult to balance work and personal life.[19] In this study, we also asked about

other sources of anxiety for residents. These sources of anxiety included concerns about being infected, availability of Personal Protective Equipment (PPE), sick family, transmission to family, concerns about the continuation of the study, continuity of incentives, and uncertainty about the end of the pandemic. We suggest this finding be considered in placement and rotation of the resident doctors also to be noted by each resident on their own that many factors can be related to their stress and anxiety.

Conclusion

This study provides an overview of anxiety in resident doctors of Universitas Hasanuddin and the factors that influence it. Anxiety was measured using stress level (PSS-10) and anxiety level (GAD-7). Overall, 48.4% of respondents experienced moderate-severe stress, and 49.6% experienced anxiety with levels varying from mild-severe.

Factors that influence stress levels and anxiety levels are psychiatric history and confirmed diagnosis history of COVID-19. Other factors that also influence stress levels are the program grade and working hours. Meanwhile, the availability of PPE also affects the residents' anxiety level.

Age, gender, financing, number of children, and number of family living in the same house did not significantly affect anxiety. Working in infectious areas and a history of contact with confirmed/suspected COVID-19 patients also had no effect on anxiety. Although there was a trend towards reduced or increased anxiety in some factors, no significance was found in this study.

The sources of anxiety included concerns about being infected, availability of Personal Protective Equipment (PPE), sick family, transmission to families, concerns about the smooth running of the study, continuity of incentives, and uncertainty about the end of the pandemic.

References

1. WHO. 2020. Q&A on coronaviruses (COVID-19). https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses#:~:text=symptoms
2. Satuan Tugas Penanganan Covid-19. 2020.
3. Rektor Universitas Hasanuddin. 2020. Surat Edaran No. 7522/UN4.1/PK.03.03/2020: Kesiapsiagaan dan Upaya Pencegahan Penyebaran Infeksi Covid-19 di Lingkungan Universitas Hasanuddin
4. Dekan Fakultas Kedokteran Universitas Hasanuddin. 2020. Surat Edaran No. 6014/UN4.6/KM.04.02/2020 tentang Pencegahan Penyebaran Covid-19
5. Shuja, KH. 2020. COVID-19 Pandemic and Impending Global Mental Health Implications. Psychiatria Danubina, 2020; Vol. 32, No. 1, pp 32-35 https://doi.org/10.24869/psyd.2020.32
6. Li, Wen. et al. 2020. Progression of Mental Health Services during the COVID-19 Outbreak in China. Int. J. Biol. Sci. 2020, Vol. 16. doi: 10.7150/ijbs.45120
7. Kang, Lijun. et al. 2020. 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, Behavior, and Immunity 87 (2020) 11–17. https://doi.org/10.1016/j.bbi.2020.03.028
8. Dubey, Souvik. et.al. 2020. Psychosocial impact of COVID-19. Diabetes & Metabolic Syndrome: Clinical Research & Reviews 14 (2020) 779e788. https://doi.org/10.1016/j.dsx.2020.05.035
9. Lai, Jianbo. et.al. 2020. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Network Open. 2020;3(3):e203976. doi:10.1001/jamanetworkopen.2020.3976
10. Serrano-Ripoll, Maria J. et. al. 2020. Impact of viral epidemic outbreaks on mental health of healthcare workers: a rapid systematic review and meta-analysis. Journal of Affective Disorders 277 (2020) 347–357. https://doi.org/10.1016/j.jad.2020.08.034
11. Babore, Alessandra. et.al. 2020. Psychological effects of the COVID-2019 pandemic: Perceived stress and coping strategies among healthcare professionals. Psychiatry Research 293 (2020) 113366. https://doi.org/10.1016/j.psychres.2020.113366
12. Korkmaz, S. et al. 2020. The anxiety levels, quality of sleep and life and problem-solving skills in healthcare workers employed in COVID-19 service. Journal of Clinical Neuroscience. Edisi 80. Hal.131–136. https://doi.org/10.1016/j.jocn.2020.07.073
13. Asmundson, Gordon J.G. et.al. 2020. Do pre-existing anxiety-related and mood disorders differentially impact COVID-19 stress responses and coping?. Journal of Anxiety Disorders 74 (2020) 102271. https://doi.org/10.1016/j.janxdis.2020.102271
14. Rogers J.P., Chesney E., Oliver D., et. al. 2020. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. Lancet Psychiatry. Mei 2020. https://doi.org/10.1016/S2215-0366(20)30203-0
15. Melaku, Leta. Mossie, Andualem. Negash, Alemayehu. 2015. Stress among Medical Students and Its Association with Substance Use and Academic Performance. Hindawi Publishing Corporation. Journal of Biomedical Education. Volume 2015. http://dx.doi.org/10.1155/2015/149509
16. Abdulghani, Hamza M. AlKanhal, Abdulaziz A. Mahmoud, Ebrahim S. et.al. 2011. Stress and Its Effects on Medical Students: A Cross-sectional Study at a College of Medicine in Saudi Arabia. J HEALTH POPUL NUTR. Oct;29(5):516-522
17. Collins, Caitlin. 2020. Stress and the Surgical Resident in the COVID-19 Pandemic. Journal of Surgical Education. https://doi.org/10.1016/j.jsurg.2020.07.031
18. Nanjundaswamy, Madhuri H. Pathak, Harsh. Chaturvedi, Santosh K. 2020. Letter to Editor: Perceived stress and anxiety during COVID-19 among psychiatry trainees. Asian Journal of Psychiatry 54 (2020) 102282. https://doi.org/10.1016/j.ajp.2020.102282
19. Kannampallil, TG. Goss, CW. Evanoff, BA. et.al. 2020. Exposure to COVID-19 patients increases physician trainee stress and burnout. PLoS ONE 15(8): e0237301. https://doi.org/10.1371/journal.pone.0237301