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Stress, Anxiety, and Depression Among Indonesian Medical Students during the COVID-19 Pandemic : A Brief Overview

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Abstract

Stress, anxiety, and depression are common psychological disorder reported among medical students worldwide. During the COVID-19 pandemic era, medical students are burdened with high academic demand and pressure, despite the quarantine and limitations. Such psychological disorders are frequently found in undergraduate students, especially in medical students, which could lead to more problematic mental health issues and may affect professionalism and, ultimately, patient safety and care. This article reviews the risk factors associated with stress, anxiety, and depression among medical students during the COVID-19 pandemic. Abundant literatures were found related to this topic, but only a few important and informative research articles were included in this review. This review provides a bigger picture of the current psychological condition among Indonesian medical students. Medical students in Indonesia had varying levels of stress, anxiety, and depression with various associated academic and non-academic risk factors.

Keywords: Stress, Anxiety, Depression, Medical students, COVID-19 pandemic

1. Introduction

The outbreak of COVID-19 resulted in the implementation of several strict regulations by the Republic of Indonesia government, which includes social distancing, work from home (WFH), limitation of outdoor activities, and mostly the PPKM or community activities restrictions enforcement. The pandemic caused effects towards the physical and mental health [1]. College students are among those affected as well, especially medical students. As academic activities shifted to distance learning which requires, students must adapt to new methods which may lead to deterioration of mental health problems, such as stress, anxiety, and depression. [2, 3, 4]. However, the underlying causes, symptoms, and effects of mental illness in the population have received little attention in Indonesia [5]. The existence of such psychological disorders could lead to negative impacts in medical students, such as decrease of quality of life, quality of sleep, and more severe psychological illness, especially if delayed in detection and treatment [3]. Moreover, being a medical student and clinical were linked to having suicidal thoughts, moderate or severe

psychological distress, and mood and anxiety disorders [6]. Since COVID-19 pandemic can affect the emotional mental state of medical students, the author would like to conduct this study to review the risk factors associated with stress, anxiety, and depression among Indonesian medical students during the pandemic of COVID-19.

2. Epidemiology

No	Author	Year	Medical School (University)	Stress (%)	Anxiety (%)	Depression (%)	n
1	Habibah et al.	2021	Sriwijaya University (UNSRI)	66.7	66.2	53.2	201
2	Tubarad et al.	2021	Muhammadiyah Jakarta University (UMJ)	10.2	47.3	21.5	205
3	Badri & Oktariza	2021	Muhammadiyah Palembang University (UMP)	22.4	50.6	33.0	312
4	Cahyaratri et al.	2022	Diponegoro University (UNDIP)	58.2	80.4	83.0	184
5	Gaite et al.	2022	Krida Wacana Christian University (UKRIDA)	44.3	86.6	57.7	97
6	Fauziyah & Aretha	2021	Surakarta Muhammadiyah University (UMS)	42.0	32.1	27.2	81
7	Tejoyuwono et al.	2021	Tanjungpura University (UNTAN)	7.5	15.0	13.5	133
8	Subhan et al.	2021	Yarsi University (UNYARSI)	39.7	43.6	45.5	156
9	Panjaitan & Suhartomi	2022	HKBP Nommensen University (UHN)	59.3	44.2	70.9	86
10	Natalia & Syakurah	2021	Not specified (Indonesia)	44.6	47.8	18.6	1027

Ten studies were included in this review in which 9 studies were conducted in specific medical schools and a study was conducted with samples from various and unspecified medical schools throughout Indonesia. The highest prevalence of stress was reported by a study in Sriwijaya University, which is 66.7% of medical students [7]. As for anxiety, the highest prevalence was found in Krida Wacana Christian University, which is 86.6% of medical students [8]. The highest prevalence of depression was reported by a study in Diponegoro University, which is 83% of medical students [9]. From the 9 university-specific studies listed above, the mean average & standard deviation of prevalence for stress, anxiety, and depression was 39.5 (20.3), 51.4 (21.4), and 42.4 (23.5) respectively.

3. Etiopathogenesis

Stress activates the HPA axis, with the release of corticotropin-releasing Hormone (CRH) and adrenocorticotropic hormone (ACTH) from hypothalamus and pituitary glands, resulting in the elevation of cortisol levels released from adrenal glands [10]. Stress is caused by stressors, which can be divided into several categories which includes life events, chronic strain, and daily hassles. A life event can potentially become the source of stress if it requires behavioral adaptation in a very short time. Chronic strain or difficulties that occur consistently or recurrent in daily life and can influence health, either physically or psychologically. Daily hassles [11,12].

Anxiety is commonly linked with neurochemistry, especially with serotonin, gamma-aminobutyric acid (GABA), dopamine, and norepinephrine. Each substance was involved in different pathways in the regulation of anxiety [13]. The dysfunction of neurotransmitters and receptors in the brain resulted in the occurrence of anxiety, primarily GABA, noradrenaline, and serotonin (5-HT) [14]. 5-HT1A receptor is also thought to take on a major role in anxiety as the activation of 5-HT1A receptors leads to an increase of potassium flow and inhibiting the activities of adenylate cyclase [15]. On the other hand, noradrenaline modulates the mechanism of autonomic stimulation, which includes the increase of heartrate and respiratory rate, which causes a physiological chain reaction that causes symptoms of panic like paresthesia, numbness, and chest tightness [13].

Depression is caused by a combination of the several factors, namely biological factors, genetic factors, and psychosocial factors [16]. There are often found abnormalities of biogenic amine metabolites in depression, such as 5-hydroxy-indoleacetic-acid (5HIAA), homovalinic acid (HVA), 3-methoxy-4-hydrophenylglycol (MPHG) in the blood, urine, and cerebrospinal fluid in patients with mood disorder [17]. Genetic data also strongly suggest that an essential factor in the development of mood disorders is genetics. A study showed that first-degree relatives (FDR) of people with depression are 3 times more likely to develop depression [18]. Psychosocial factors also influence depression, such as life events and environment stressors, personality, psychodynamic, repetitive failure, theory of cognitive and social support [16].

4. Associated Risk Factors during the COVID-19 Pandemic

4.1. High workload and tight schedule

In a study conducted on Muhammadiyah Jakarta University medical students, anxiety was found the most in 1st year students followed which is almost twice the percentage of anxiety in 4th

year students. 1st year students most likely experience anxiety due to the lack of free time with family and entertainments with friends and tight schedule of classes and laboratory work on the 1st year curriculum. Meanwhile, 4th year students are burdened with thesis, OSCE (comprehensive final exam before proceeding into clinical clerkship at the academic hospital [19]. This is also in line with another study which found that junior students were more likely to be anxious than senior students [20].

4.2. Studying at home and academic procrastination

Due to the COVID-19 pandemic and restrictions, almost all academic activities had to be conducted virtually. Academic activities, such as direct lecture activities, basic clinical skills, and problem-based learning classes had to be conducted virtually [21]. During such condition, students tend to experience the feeling of having plenty of leisure time, inevitably delaying duties, and eventually experiencing academic procrastination. Academic procrastination is positively correlated with the occurrence of stress, anxiety, and depression. Students who procrastinate can experience anxiety and stressful events, and due to low achievement as a result of procrastinating, they will likely suffer from depression [9]. Moreover, students might experience anxiety due to worrying about network interruptions during online lecture, especially as exam approaches [19]. The virus outbreak hinders students from completing numerous duties due to online learning. Students struggle to complete group tasks additional to the heavy personal workload because of the inadequate condition, obstacles in the network connection, and exhaustion from online learning [22]. In addition, bad perception towards online learning can affect the likelihood of depression in medical students [23].

4.3. Social Activity Restriction

The government has ordered all schools and colleges to close due to the outbreak of COVID-19 restrictions which leads to the students forced to stay at home and attend lectures virtually. Due to the restriction on social activity, this policy will likely cause students to become bored, frustrated, depressed, anxious, and stressed. It also may have an unfavorable effect on college students [24]. As physical distancing is highly emphasized during the restriction, students become worried about friendship. The lack of social interaction while students are studying online can increase their level of academic stress [20]. This was also in line with another study in Krida Wacana Christian University medical students which found that stress, anxiety, and depression were found more in students with less active social interaction [8].

4.4. Other Factors

One of the factors that caused stress during the COVID-19 outbreak was the financial status dicrease in the family [25]. Anxiety disorders were also found associated with the decrease of family income in students during the outbreak. A study which found 5.5% of medical students experienced depression during the pandemic are due to various factors, one of which is the fear of extending study period which could burden the financial status of the family [26 , 27]. Other study also mentioned that the stress, anxiety, and depression are associated with sleep quality in medical students [28]. Meanwhile, medical students are very prone to bad quality of sleep due to intense and demanding physical and emotional training during study [29]. In addition, depressive and anxious symptoms are found in students with big financial burden, high academic stres, and bad quality of sleep [30]. Other factors include the fear of getting infected by COVID-19 as reported in 84.71% of medical students [31].

5. Conclusion

Various academic and non-academic factors were linked with stress, anxiety, and depression in medical students of Indonesia during the COVID-19 pandemic. Stress, anxiety, and depression in medical students should be managed as these conditions could lead to negative outcomes and effects in medical students. It is suggested that medical schools and universities in Indonesia evaluate and perform intervention by considering the relatively high prevalence of mental illness in medical students during the COVID-19 pandemic, especially as Indonesia is entering the new normal era.

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References

1. Setiawati, Y. *et al.* (2021) “Anxiety and resilience of healthcare workers during COVID-19 pandemic in Indonesia,” *Journal of Multidisciplinary Healthcare*, Volume 14, pp. 1–8. Available at: https://doi.org/10.2147/jmdh.s276655.
2. Fauziyyah, R., Awinda, R.C. and Besral, B. (2021) “Dampak Pembelajaran Jarak Jauh Terhadap Tingkat stres Dan Kecemasan mahasiswa selama pandemi covid-19,” *Jurnal Biostatistik, Kependudukan, dan Informatika Kesehatan*, 1(2), p. 113. Available at: https://doi.org/10.51181/bikfokes.v1i2.4656.
3. Tejoyuwono, A.A., Nugraha, R.P. and Fahdi, F.K. (2021) “The effect of mental health status on the

quality of life of Faculty of Medicine students during The pandemic coronavirus disease 2019 Period," *Open Access Macedonian Journal of Medical Sciences*, 9(E), pp. 645–652. Available at: https://doi.org/10.3889/oamjms.2021.6161.

4. Pelucio, L. *et al.* (2022) "Depression and anxiety among online learning students during the COVID-19 pandemic: A cross-sectional survey in Rio de Janeiro, Brazil," *BMC Psychology*, 10(1). Available at: https://doi.org/10.1186/s40359-022-00897-3.
5. Maramis, M.M., Pantouw, J.G. and Lesmana, C.B. (2020) "Depression screening in Surabaya Indonesia: Urgent need for better mental health care for high-risk communities and suicide prevention for men," *International Journal of Social Psychiatry*, 67(5), pp. 421–431. Available at: https://doi.org/10.1177/0020764020957359.
6. Ursula, F., Sunjaya, A.P. and Chris, A. (2021) "Anxiety and Sleep Quality Among Medical Students in Indonesia During the COVID–19 Pandemic," Proceedings of the 1st Tarumanagara International Conference on Medicine and Health (TICMIH 2021), 41. Available at: https://doi.org/10.2991/ahsr.k.211130.015.
7. Habibah, U. *et al.* (2021) "Depression, anxiety, and stress among students of Sriwijaya University," *Indigenous: Jurnal Ilmiah Psikologi*, 6(3), pp. 23–35. Available at: https://doi.org/10.23917/indigenous.v6i3.12629.
8. Gaite, G., Ingkiriwang, E. and Tania, E. (2022) "Gambaran Tingkat stress, Kecemasan Dan Depresi Mahasiswa Saat Adaptasi Tahun kedua pandemi covid-19," *Jurnal Kedokteran Meditek*, 28(3), pp. 289–294. Available at: https://doi.org/10.36452/jkdoktmeditek.v28i3.2381.
9. Cahyaratri, M.T. *et al.* (2022) "The relationship of academic procrastination with stress, anxiety, and depression during the COVID-19 pandemic in students of the Medical Study Program, Faculty of Medicine, undip," *Diponegoro Medical Journal (Jurnal Kedokteran Diponegoro)*, 11(3), pp. 149–153. Available at: https://doi.org/10.14710/dmj.v11i3.33244.
10. Karin, O. et al. (2020) "A new model for the HPA axis explains dysregulation of stress hormones on the timescale of weeks," *Molecular Systems Biology*, 16(7). Available at: https://doi.org/10.15252/msb.20209510.
11. Thoits, P.A. (1995) "Stress, coping, and Social Support Processes: Where are we? what next?," *Journal of Health and Social Behavior*, 35, p. 53. Available at: https://doi.org/10.2307/2626957.
12. Lumban Gaol, N.T. (2016) "Teori stres: Stimulus, respons, Dan transaksional," *Buletin Psikologi*, 24(1), p. 1. Available at: https://doi.org/10.22146/bpsi.11224.
13. Azzahra, F., Oktarlina, R.Z. and Hutasoit, H.B. (2020) "Farmakoterapi Gangguan Ansietas Dan Pengaruh jenis Kelamin Terhadap efikasi antiansietas," *JIMKI: Jurnal Ilmiah Mahasiswa Kedokteran Indonesia*, 8(1), pp. 96–103. Available at: https://doi.org/10.53366/jimki.v8i1.44.
14. Somers, J.M. *et al.* (2006) "Prevalence and incidence studies of anxiety disorders: A systematic review of the literature," *The Canadian Journal of Psychiatry*, 51(2), pp. 100–113. Available at: https://doi.org/10.1177/070674370605100206.
15. Soodan, S. and Arya, A. (2015) "Understanding the Pathophysiology and Management of the Anxiety Disorders," *International Journal of Pharmacy & Pharmaceutical Research*, 4(3).
16. Kaplan, H., Sadock, B. and Grebb, J., 2010. *Sinopsis Psikiatri: Ilmu Pengetahuan Perilaku Psikiatri Klinis*. Tangerang: Binarupa Aksara.
17. Marsasina, A. and Fitrikasari, A. (2021) "Gambaran dan Hubungan Tingkat Depresi dengan Faktor-Faktor yang Mempengaruhi pada Pasien Rawat Jalan Puskesmas (Studi Deskriptif Analitik di Puskesmas Halmahera Semarang)," *Jurnal Kedokteran Diponegoro*, 5(4), pp. 440–450. Available at: https://doi.org/10.14710/dmj.v5i4.14240.
18. Chand, S.P. and Arif, H. (2022) *Depression*, *NCBI*. Treasure Island, FL: StatPearls. Available at: www.ncbi.nlm.nih.gov/books/NBK430847.
19. Tubarad, G.D. *et al.* (2021) "An overview of medical students' psychological in the process of

distance learning on pandemic covid-19," *Muhammadiyah Medical Journal*, 2(2), p. 62. Available at: https://doi.org/10.24853/mmj.2.2.62-69.

20. Badri, P.R. and Oktariza, R.T. (2021) "Psychological problems during the COVID-19 pandemic among medical students : A cross-sectional study," *Indonesian Journal of Environmental Management and Sustainability*, 5(3). Available at: https://doi.org/10.26554/ijems.2021.5.3.113-117.
21. Daroedono, E. *et al.* (2020) "The impact of covid-19 on medical education: Our students perception on the practice of Long Distance Learning," *International Journal Of Community Medicine And Public Health*, 7(7), p. 2790. Available at: https://doi.org/10.18203/2394-6040.ijcmph20202545.
22. Deliviana, E. *et al.* (2021) "Pengelolaan kesehatan mental mahasiswa bagi optimalisasi pembelajaran onlinedi masa pandemi covid-19," *Jurnal Selaras : Kajian Bimbingan Dan Konseling Serta Psikologi Pendidikan*, 3(2).
23. Panjaitan, J.S.G. and Suhartomi (2022) "Pengaruh Persepsi Pembelajaran Daring terhadap Kesehatan Mental Mahasiswa di Fakultas Kedokteran Universitas HKBP Nommensen," *Majalah Kedokteran Andalas*, 45(3), pp. 356–366. Available at: https://doi.org/10.25077/mka.v45.i3.p356-366.2022.
24. Hasanah, U. *et al.* (2020) "Psychological description of students in the learning process during pandemic covid-19," *Jurnal Keperawatan Jiwa*, 8(3), p. 299. Available at: https://doi.org/10.26714/jkj.8.3.2020.299-306.
25. Otten, D. *et al.* (2021) "Similarities and differences of mental health in women and men: A systematic review of findings in three large German cohorts," *Frontiers in Public Health*, 9. Available at: https://doi.org/10.3389/fpubh.2021.553071.
26. Elmer, T., Mepham, K. and Stadtfeld, C. (2020) "Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland," *PLOS ONE*, 15(7). Available at: https://doi.org/10.1371/journal.pone.0236337.
27. Risal, A. et al. (2020) "Anxiety and depression during COVID-19 pandemic among medical students in Nepal," Kathmandu University Medical Journal, 18(4), pp. 333–339. Available at: https://doi.org/10.3126/kumj.v18i4.49241.
28. Fauziyah, N.F. and Aretha, K.N. (2021) "Hubungan Kecemasan, depresi Dan stres Dengan Kualitas Tidur Mahasiswa fakultas Kedokteran Selama pandemi covid-19," *Herb-Medicine Journal*, 4(2), p. 42. Available at: https://doi.org/10.30595/hmj.v4i2.10064.
29. Wong, J.G.W.S. *et al.* (2005) "Cultivating psychological well-being in Hong Kong's future doctors," *Medical Teacher*, 27(8), pp. 715–719. Available at: https://doi.org/10.1080/01421590500237945.
30. Subhan, D.H. *et al.* (2021) "perbedaan status kesehatan mental mahasiswa fakultas kedokteran universitas yarsi angkatan 2019 pada saat sebelum dengan pada saat pandemi covid-19," *Prosiding Seminar Nasional Riset Kedokteran (SENSORIK) 2021*, 2(1).
31. Natalia, D. and Syakurah, R.A. (2021) "Mental health state in medical students during COVID-19 pandemic," *Journal of Education and Health Promotion*, 10(1), p. 208. Available at: https://doi.org/10.4103/jehp.jehp_1296_20.