❒ 1362

Second year of COVID-19 pandemic: mental health among Indonesian urban population

Nicholas Hardi¹, Isadora Gracia², Linawati Hananta³

¹Department of Psychiatry and Behavioral Science, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia
²Department of Dental Medicine, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia
³Department of Pharmacology, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia

Article Info

ABSTRACT

Mental health problems, particularly anxiety and depression, have increased since the early pandemic. This phenomenon still occurs when the pandemic reached its second year. The study explored the prevalence of anxiety and depression among the urban population. A cross-sectional study was conducted during Jakarta's third dose of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccination programs. The Indonesian version of generalized anxiety disorder-7 (GAD-7) and the patient health questionnaire-9 (PHQ-9) were used to estimate clinically significant anxiety and depression, respectively. Out of the 356 participants, 18.5% and 29.2% of participants presented clinically significant anxiety and depression, respectively. Age differences between the probable anxiety and depression groups with their respective counterparts were statistically significant (p<0.001). Both groups showed a lower mean age. Lower age showed significantly higher anxiety (OR 1.05; 95% CI 1.0-1.1) and depressive problems (OR 1.07; 95% CI 1.0-1.1). Our result indicated that clinically significant anxiety and depression symptoms were prevalent among the urban population during the second year of the pandemic. Age differences might be an important predictive factor for both symptoms. Age-specific interventions are considered helpful to achieve better mental health and reduce the prevalence.

Corresponding Author:

Linawati Hananta
Department of Pharmacology, School of Medicine and Health Sciences,
Atma Jaya Catholic University of Indonesia
Pluit Raya Road No 2, Penjaringan, North Jakarta, Indonesia
Email: linawati.hananta@atmajaya.ac.id

1. INTRODUCTION

It has been two years since the World Health Organization announced the pandemic of coronavirus disease 19 (COVID-19). In 2021, Indonesia had the highest number of COVID-19 confirmed cases and death among Southeast Asia countries [1]. Jakarta, the capital city of Indonesia, served as a warning zone. Jakarta's COVID-19 cases and death numbers escalated rapidly until January 2021 [1]. At the end of 2021, a new variant of concern (VOC) known as omicron was identified [2]. Omicron emerged in our weary world due to the combat against the previous waves of infections. The emergence of new VOC was associated with a new wave of infection. The concern about omicron includes its rapid transmission and whether the available vaccine would be sufficient for protection [2].

The emergence of COVID-19 escalated mental health problems [3]–[5]. The infection rates, loss of family members, economic changes, and shifting government priorities to contain the outbreak affected psychological well-being [6]. The global burden of disease, injuries, and risk factors study (GBD) reported that depressive and anxiety disorders were among the leading causes of health burden worldwide for all ages in 2019 [7]. The COVID-19 mental disorders collaborators estimated that the pandemic escalated the case of anxiety disorders (25.6%) and major depressive disorders (27.6%) globally in 2020 [6]. Both disorder were slightly higher among previously severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) positive (30.4%) vs SARS-CoV-2-negative (26.1%) individuals [8]. The COVID-19 pandemic influenced mental health both directly and indirectly. The virus infection mediated the direct effect of acute and long-lasting neuropsychiatric sequelae [9]. Indirect effects were mediated by societal changes, such as large-scale social restrictions [10], work-from-home (WFH) culture adaptation [11], quarantine for the COVID-19 patients [12], [13], and the survivors' dynamic [14].

Similar situations have also occurred in Indonesia. The prevalence of anxiety during the early period of the COVID-19 pandemic in Indonesia was 20.2% [15]. Other research reported that depression and anxiety symptoms in Indonesia during 2020 were 20.8% and 34.6%, respectively [16]. The data above indicate that the early period of COVID-19 pandemic also impacted mental health in Indonesia. We thought societal changes could happen as the COVID-19 pandemic progressed from the initial phase. Research by Robinson and Daly [17] argued the potential role of psychological adaptation after acutely responding to a distressing event. Vaccination might help reduce 50% of post-acute COVID syndromes, which served as a protective factor [9]. SARS-CoV-2 vaccination showed a lower distress level in the vaccination recipients group comparing the counterpart [18]. The indirect effects of the decline of anticipatory fears were related to the perceived risk of infection and death [18].

During the study, Indonesia began the SARS-CoV-2 vaccination program. The vaccination reduced mental health risks [18], [19]. However, we anticipated a new VOC might illicit a new wave of infection [2], which lead to more mental health burdens, especially for Jakarta citizens. Jakarta was a city with a population density of around 13,000 people per km2 with an urban culture [20] and used to provide the highest number of COVID-19-related cases and death COVID-19 in 2021 [1]. Our work explored the magnitude of mental health disorders, specifically clinically significant anxiety and depression, that focused on Jakarta. Some potential factors related to anxiety and depression were also studied. The result should be applicable for the stakeholders to put their concerns about mental health and identify whether any changes happened since the beginning of the pandemic. The changes in mental health prevalence could be used as a reference to develop further mental health-related support.

2. RESEARCH METHOD
2.1. Study design and participants
The cross sectional was part of a large study that evaluated the immunity level after having the third dose of the SARS-CoV-2 vaccine. The study was conducted from 4th to 17th February 2022 at the School of Medicine and Health Science Atma Jaya Catholic University of Indonesia. The institution held the third dose of the SARS-CoV-2 vaccination program during the sampling process. More than 18-year-old adults who received the shot at the site were invited into this study. Written consent was required before participating in the study. The institutional review board approved ethical clearance from the School of Medicine and Health Science of the Atma Jaya Catholic University of Indonesia (07/02/KEP-FKUAJ/2022). The research was conducted according to the Declaration of Helsinki.

2.2. Measurement
Each subject was free to choose their preference to submit their response through a paper-based or online-based questionnaire. The online-based questionnaire was built using Google Forms. Data on respondents' demographic information, COVID-19 history, anxiety disorder, and depression were collected. Demographic information included age, sex, education level, and whether currently working from home. Education level was classified into lower (elementary, junior, or senior high school graduate) and higher (bachelor, master, or doctoral degree) levels. The subjects were asked about any previous history of confirmed COVID-19 diagnosis. Working from home status required the subjects to choose whether they were mainly working from home or not based on the majority of their job arrangements.

The Indonesian version of generalized anxiety disorder-7 (GAD-7) was used to screen anxiety disorders. It is a self-report screening measurement to evaluate how frequently the subjects experienced anxiety symptoms in the last two weeks. The scale has seven items and is rated using a 4-Likert scale (0=not at all, 1=several days, 2=more than half the days, 3=nearly every day) [21]. GAD-7 represents the diagnostic and statistical manual of mental disorders (DSM) IV conceptualization of GAD [21]. Moreover, it is free to access (*phqscreeners.com*), used in general population [15], and psychometrically sound [21]. The Indonesian version

was found reliable in the epilepsy population (Cronbach's α=0.867) [22]. The GAD-7 was found reliable in this study (Cronbach's α=0.92). A score of 7 or greater on the Indonesian version estimated a clinically significant anxiety disorder, referred to as probable anxiety [22].

The patient health questionnaire-9 (PHQ-9) is nine items self-administered depression scale. The scale was rated using a 4-Likert scale (0=not at all, 1=several days, 2=more than half the days, 3=nearly every day) [23]. The PHQ-9 was chosen to assess depressive symptoms due to its free access, widely used, and the scales represent the DSM IV conceptualization of depression. The psychometric properties of PHQ-9 have been widely used in medical, clinical, community, and college samples [23]. The Indonesian version of PHQ-9 was obtained from the free accessible PHQ website (*phqscreeners.com*). The translation has translated well and showed good reliability (Cronbach's α=0.86) [24]. The PHQ-9 was found reliable in this study (Cronbach's α=0.92). A score of 5 or greater is considered clinically significant depression, referred to as probable depression [23].

2.3. Statistical analyses

The prevalence of anxiety disorder and depression was estimated based on the categorical data. The Chi-square test was performed to determine the association between the demographic information and COVID-19 history with anxiety disorder and depression. The Kolmogorov-Smirnov test was performed to determine the distribution of the continuous data. The normally distributed continuous data were presented using mean and standard deviation (SD). Logistic regression analyses were performed to estimate any variable related to probable anxiety and depression. The odds ratio (OR) was calculated based on the multivariate analyses, and no further variable adjustment was performed during the regression analyses. The statistical significance was determined from the two-tailed p-value of less than 0.05. The SPSS IBM version 25 for Windows was used to analyze data.

3. RESULTS AND DISCUSSION
3.1. Results

The total of 356 participants who completed the process, the prevalence of clinically significant anxiety and depression was 18.5% and 29.2%, respectively. Around 15.4% of participants met both clinically significant anxiety and depression criteria. Detailed information on participants' characteristics shown in Table 1.

Table 1. Characteristics of the participants

Characteristics		N (%)
Age; mean (SD)		35.4 (14.0)
Sex	Male	178 (50)
	Female	178 (50)
Education level	Low	145 (40.7)
	High	211 (59.3)
WFH	Yes	289 (81.2)
	No	67 (18.8)
COVID-19 history	Yes	57 (16)
	No	299 (84)
Probable anxiety	Yes	66 (18.5)
	No	290 (81.5)
Probable depression	Yes	104 (29.2)
	No	252 (70.8)
Probable comorbidity	Yes	55 (15.4)
	No	301 (84.6)

The probable anxiety and depression group was significantly younger than their counterpart. The proportion of female participants that met the anxiety and depression criteria were similar to that of male participants. Both disorder groups were predominated with lower education background, not working from home, and no prior COVID-19 history. Only age survived the multivariate analyses. Younger age was a significant risk of probable anxiety (OR: 1.05; 95% CI: 1-1.1) and probable depression (OR: 1.07; 95% CI: 1.0-1.1). Tables 2 and 3 presented the variables related to probable anxiety and depression, respectively.

Table 2. Factors related to probable anxiety

	Probable anxiety	Not probable anxiety	p	OR (95% CI)
Age, mean (SD)	29.42 (12.1)	36.82 (14.1)	<0.001†	1.05 (1.0-1.1)†
Sex, n (%)			0.79	1.05 (0.6-1.8)
Male	32 (18)	146 (82)		
Female	34 (19.1)	144 (80.9)		
Education background			0.39	1.08 (0.6 – 1.9)
Low	30 (20.7)	115 (79.3)		
High	36 (17.1)	175 (82.9)		
WFH			0.58	0.92 (0.5-1.8)
Yes	52 (18)	237 (82.0)		
No	14 (20.9)	53 (79.1)		
COVID-19 history			0.56	0.81 (0.4-1.8)
Yes	9 (15.8)	48 (84.2)		
No	57 (19.1)	242 (80.9)		

Note: the OR was calculated based on the multivariate analyses. † showed statistical significance.

Table 3. Factors related to probable depression

	Probable depression	Not probable depression	p	OR (95% CI)
Age, mean (SD)	28.8 (10.2)	38.2 (14.4)	<0.001†	1.07 (1.0-1.1)†
Sex, n (%)			0.641	1.03 (0.6-1.7)
Male	50 (28.1)	128 (71.9)		
Female	54 (30.3)	124 (69.7)		
Education background			0.879	0.82 (0.5-1.4)
Low	43 (29.7)	102 (70.3)		
High	61 (28.9)	150 (71.1)		
WFH			0.469	0.93 (0.5-1.7)
Yes	82 (28.4)	207 (71.6)		
No	22 (32.8)	45 (67.2)		
COVID-19 history			0.399	0.76 (0.4-1.5)
Yes	14 (24.6)	43 (75.4)		
No	90 (30.1)	209 (69.9)		

Note: the OR was calculated based on the multivariate analyses. † showed statistical significance.

3.2. Discussion

This study aimed to explore the magnitude of clinically significant anxiety and depression symptoms in the urban population. The prevalence of probable anxiety and probable depression were 18.5% and 29.2%, respectively. The groups with mental health problems were significantly younger than their counterparts. The measured mental health problems were not significantly associated with sex, educational background, WFH status, or COVID-19 history.

The proportion of participants with clinically significant anxiety in our study was lower than the findings during the early period of the COVID-19 pandemic in Indonesia (20.2%) [15] and previous meta-analyses (31.9%) [12]. A meta-analysis of longitudinal data showed that the prevalence of mental health symptoms, including anxiety, was changing during the early period of the pandemic, increasing in the early stages (March-April 2020) and then decreasing over the following months (May-July 2020) [25]. Although further research is needed, the lower prevalence of anxiety reduction among our subjects might be related to the psychological adaptation since the pandemic's beginning. COVID-19-related concerns, such as financial risk (i.e., depleted cash) and personal health concerns (i.e., perceived risk of infection and death from COVID-19), rose sharply at the early stage of the pandemic [17]. These concerns might contribute to the rise of psychological distress, and decreasing in these concerns showed otherwise [17]. The study was conducted during the third dose vaccination program, so our participants were homogenous. Our specific vaccinated population might partly explain the slight decrease in anxiety prevalence.

The prevalence of probable depression in this study was slightly lower than that reported in a meta-analysis (31.4%) [12]. Compared to another study conducted by Purnamasari and Rosa [26] the prevalence of depression in the current study was slightly higher than their findings (25.7%). Method differences, such as potential selection bias, might partly explain the gap between our result and existing studies. However, the prevalence of probable depression had not reached the pre-pandemic level. Basic health research in 2018 found that the national prevalence of depression was 6.1% [27]. This information was noteworthy as an alarming message. Depression has been a concern since before the pandemic as a contributing disorder that causes burdens [7]. Effective intervention should be taken to reduce the depression in our society.

Hence, the potential problems could be impacted by the rise of depression during the COVID-19 pandemic. Robinson et al. [25] suggested that any increase in the prevalence of depressive symptoms disorder that did not return to pre-pandemic levels required attention. It implied that a slight escalation in depression

cases in a population might impact cumulative consequences [25]. Longitudinal research involving adults in the United States (U.S.) found that 20.3% of participants reported persistent depressive symptoms from March and April 2020 to 2021 [28]. Exploration for these potential persistent depressive symptoms and intervention efforts should be conducted to reduce the prevalence to at least reach the pre-pandemic level. Previous report showed the reduction of depressive prevalence has been noted, however the prevalence did not reach the pre pandemic level [29]. People who experienced higher loneliness at the pandemic's beginning also experienced higher depression. A study found that changes in the social restriction severity did not influence the rate of depressive symptoms reduction. However, loneliness reduction might provide significant relief from depression [30]. This study's prevalence of probable depression was higher than probable anxiety. The comparison between studies was inconsistent. A study in the early pandemic revealed that an increase in depression tended to be higher than anxiety (March-April 2020) and remained significantly elevated some months later (May-July 2020) [25]. Meanwhile, another meta-analysis showed that the prevalence of depression was quite similar to anxiety [12].

Consistent with existing studies [26], [31]–[33], the average age of probable depression and anxiety groups in the current study was younger than their counterparts. Stress, depression, and anxiety severity were decreased from younger to older age groups [31]. Older than 40 years was related to a lower risk of anxiety [32]. A previous study in the U.S. revealed that moderate mental distress was more prevalent among the younger than the older group during the initial phase of the pandemic [33]. Some restrictions applied during the pandemic were more correlated with the mental health distress of the young than the older adults [33]. It might relate to younger adults being more mobile in their activities [33]. The activity reduction might explain the underlying distress. Meanwhile, restrictions on more than 250 people gathering restrictions and the closure of work were related to the distress of adults over 55 years [33]. As for middle-aged adults (35-54 years old), restrictions on international travel, the reasonable possibility of job prospects, and prior mental health problems contributed to the risk of mental health distress [33]. The authors argue the benefit of age-specific intervention to optimize the mental health need [31], [33].

Some limitations should be noted when interpreting the current findings. We involved participants from the urban population to observe mental health problems during the second-year pandemic. However, they were exclusively the third-dose vaccination recipient. We have mentioned the potential protective factor of the vaccination against anxiety, which should be compared with the group that has not received the third vaccination dose. As this study was part of a large study, we recommended further studies to explore the effect of vaccination on mental health. Despite the limitation, we tried to explore the prevalence of probable anxiety and depression during the second year of the pandemic in the urban population, which might serve as an insight for further research.

Currently, there is limited information to indicate the end of the pandemic and how the psychological impact will resolve. We argue that the psychological impacts due to COVID-19 pandemic were still probably ongoing and risk a more significant cumulative case in the future, such as persistent depressive symptoms [28]. We suggested placing mental health equal priority as physical health. Longitudinal research would be beneficial to explore the potential contributing factors to mental health problems.

4. CONCLUSION

Our result indicated that clinically significant anxiety and depression symptoms were prevalent among the urban population during the second year of the pandemic. Age differences might be an important predictive factor for both symptoms. Age specifics counter-measures might be needed to resolve mental health issues. Bringing mental health into our agenda and intervening in it would help reduce the cases to the pre-pandemic level. Finally, further research was required to reveal the best approach for the public to reduce mental health problems during the pandemic.

REFERENCES

[1]   H. Surendra *et al.*, "Clinical characteristics and mortality associated with COVID-19 in Jakarta, Indonesia: a hospital-based retrospective cohort study," *The Lancet Regional Health - Western Pacific*, vol. 9, pp. 1–9, Apr. 2021, doi: 10.1016/j.lanwpc.2021.100108.

[2]   S. S. A. Karim and Q. A. Karim, "Omicron SARS-CoV-2 variant: a new chapter in the COVID-19 pandemic," *The Lancet*, vol. 398, no. 10317, pp. 2126–2128, Dec. 2021, doi: 10.1016/S0140-6736(21)02758-6.

[3]   F. Kaligis, M. T. Indraswari, and R. I. Ismail, "Stress during COVID-19 pandemic: mental health condition in Indonesia," *Medical Journal of Indonesia*, vol. 29, no. 4, pp. 436–441, Oct. 2020, doi: 10.13181/mji.bc.204640.

[4]   J. Bueno-Notivol, P. Gracia-García, B. Olaya, I. Lasheras, R. López-Antón, and J. Santabárbara, "Prevalence of depression during the COVID-19 outbreak: a meta-analysis of community-based studies," *International Journal of Clinical and Health Psychology*, vol. 21, no. 1, pp. 1–11, Jan. 2021, doi: 10.1016/j.ijchp.2020.07.007.

[5]   A. Radfar, M. M. Ferreira, J. P. Sosa, and I. Filip, "Emergent crisis of COVID-19 pandemic: mental health challenges and opportunities," *Frontiers in Psychiatry*, vol. 12, pp. 1–6, 2021, doi: 10.3389/fpsyt.2021.631008.

[6]   D. F. Santomauro *et al.*, "Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic," *The Lancet*, vol. 398, no. 10312, pp. 1700–1712, Nov. 2021, doi: 10.1016/S0140-6736(21)02143-7.

[7]   T. Vos *et al.*, "Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the global burden of disease study 2019," *The Lancet*, vol. 396, no. 10258, pp. 1204–1222, Oct. 2020, doi: 10.1016/S0140-6736(20)30925-9.

[8]   K. Klaser *et al.*, "Anxiety and depression symptoms after COVID-19 infection: results from the COVID symptom study app," *Journal of Neurology, Neurosurgery & Psychiatry*, vol. 92, no. 12, pp. 1254–1258, Dec. 2021, doi: 10.1136/jnnp-2021-327565.

[9]   B. W. J. H. Penninx, M. E. Benros, R. S. Klein, and C. H. Vinkers, "How COVID-19 shaped mental health: from infection to pandemic effects," *Nature Medicine*, vol. 28, no. 10, pp. 2027–2037, Oct. 2022, doi: 10.1038/s41591-022-02028-2.

[10]   L. Knox, G. C. Karantzas, D. Romano, J. A. Feeney, and J. A. Simpson, "One year on: what we have learned about the psychological effects of COVID-19 social restrictions: a meta-analysis," *Current Opinion in Psychology*, vol. 46, pp. 1–12, Aug. 2022, doi: 10.1016/j.copsyc.2022.101315.

[11]   Y. Xiao, B. Becerik-Gerber, G. Lucas, and S. C. Roll, "Impacts of working from home during COVID-19 pandemic on physical and mental well-being of office workstation users," *Journal of Occupational & Environmental Medicine*, vol. 63, no. 3, pp. 181–190, Mar. 2021, doi: 10.1097/JOM.0000000000002097.

[12]   T. Wu *et al.*, "Prevalence of mental health problems during the COVID-19 pandemic: a systematic review and meta-analysis," *Journal of Affective Disorders*, vol. 281, pp. 91–98, Feb. 2021, doi: 10.1016/j.jad.2020.11.117.

[13]   M. A. P. Lusida *et al.*, "Prevalence of and risk factors for depression, anxiety, and stress in non-hospitalized asymptomatic and mild COVID-19 patients in East Java province, Indonesia," *PLOS ONE*, vol. 17, no. 7, pp. 1–17, Jul. 2022, doi: 10.1371/journal.pone.0270966.

[14]   Y. Xie, E. Xu, and Z. Al-Aly, "Risks of mental health outcomes in people with COVID-19: cohort study," *BMJ*, vol. 376, pp. 1–13, Feb. 2022, doi: 10.1136/bmj-2021-068993.

[15]   G. Anindyajati *et al.*, "Anxiety and its associated factors during the initial phase of the COVID-19 pandemic in Indonesia," *Frontiers in Psychiatry*, vol. 12, pp. 1–10, Mar. 2021, doi: 10.3389/fpsyt.2021.634585.

[16]   M. Izzatika, R. A. Syakurah, and I. Bonita, "Indonesia's mental health status during the COVID-19 pandemic," *Indigenous: Jurnal Ilmiah Psikologi*, vol. 6, no. 2, pp. 78–92, Nov. 2021, doi: 10.23917/indigenous.v6i2.14024.

[17]   E. Robinson and M. Daly, "Explaining the rise and fall of psychological distress during the COVID-19 crisis in the United States: longitudinal evidence from the understanding America study," *British Journal of Health Psychology*, vol. 26, no. 2, pp. 570–587, May 2021, doi: 10.1111/bjhp.12493.

[18]   J. Koltai, J. Raifman, J. Bor, M. McKee, and D. Stuckler, "COVID-19 vaccination and mental health: a difference-in-difference analysis of the understanding America study," *American Journal of Preventive Medicine*, vol. 62, no. 5, pp. 679–687, May 2022, doi: 10.1016/j.amepre.2021.11.006.

[19]   S. Chen, A. R. Aruldass, and R. N. Cardinal, "Mental health outcomes after SARS-CoV-2 vaccination in the United States: a national cross-sectional study," *Journal of Affective Disorders*, vol. 298, pp. 396–399, Feb. 2022, doi: 10.1016/j.jad.2021.10.134.

[20]   R. Martinez and I. N. Masron, "Jakarta: a city of cities," *Cities*, vol. 106, pp. 1–11, Nov. 2020, doi: 10.1016/j.cities.2020.102868.

[21]   R. L. Spitzer, K. Kroenke, J. B. W. Williams, and B. Löwe, "A brief measure for assessing generalized anxiety disorder: the GAD-7," *Archives of Internal Medicine*, vol. 166, no. 10, pp. 1092–1097, May 2006, doi: 10.1001/archinte.166.10.1092.

[22]   A. Budikayanti, A. Larasari, K. Malik, Z. Syeban, L. A. Indrawati, and F. Octaviana, "Screening of generalized anxiety disorder in patients with epilepsy: using a valid and reliable Indonesian version of generalized anxiety disorder-7 (GAD-7)," *Neurology Research International*, vol. 2019, pp. 1–10, Jun. 2019, doi: 10.1155/2019/5902610.

[23]   K. Kroenke, R. L. Spitzer, and J. B. W. Williams, "The PHQ-9: validity of a brief depression severity measure," *Journal of General Internal Medicine*, vol. 16, no. 9, pp. 606–613, Sep. 2001, doi: 10.1046/j.1525-1497.2001.016009606.x.

[24]   B. J. Hall, A. Patel, L. Lao, A. Liem, E. H. Mayawati, and S. Tjipto, "Structural validation of the patient health questionnaire-9 (PHQ-9) among Filipina and Indonesian female migrant domestic workers in Macao," *Psychiatry Research*, vol. 295, pp. 1–7, Jan. 2021, doi: 10.1016/j.psychres.2020.113575.

[25]   E. Robinson, A. R. Sutin, M. Daly, and A. Jones, "A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic in 2020," *Journal of Affective Disorders*, vol. 296, pp. 567–576, Jan. 2022, doi: 10.1016/j.jad.2021.09.098.

[26]   E. R. W. Purnamasari and R. D. D. Rosa, "Depression among Indonesian citizens in the post-COVID-19 pandemic era: a descriptive survey," *Journal of Healthcare Administration*, vol. 1, no. 2, pp. 46–53, Dec. 2022, doi: 10.33546/joha.2333.

[27]   A. T. Endarti, N. Andriani, and E. S. Pambudi, "Disability and depression among population aged 18-59 years in Central Sulawesi Province: analysis of riskesdas 2018," *Media Kesehatan Masyarakat Indonesia*, vol. 16, no. 4, pp. 519–529, Dec. 2020, doi: 10.30597/mkmi.v16i4.9826.

[28]   C. K. Ettman *et al.*, "Assets, stressors, and symptoms of persistent depression over the first year of the COVID-19 pandemic," *Science Advances*, vol. 8, no. 9, pp. 1–9, Mar. 2022, doi: 10.1126/sciadv.abm9737.

[29]   D. P. Adams, J. R. Holt, J. A. Martin, D. M. Houpy, and K. A. Hollenbach, "The effect of COVID-19 lockdown on PHQ depression screening scores for high school athletes," *International Journal of Environmental Research and Public Health*, vol. 19, no. 16, pp. 1–9, Aug. 2022, doi: 10.3390/ijerph19169943.

[30]   M. H. Lim *et al.*, "A global longitudinal study examining social restrictions severity on loneliness, social anxiety, and depression," *Frontiers in Psychiatry*, vol. 13, pp. 1–10, Mar. 2022, doi: 10.3389/fpsyt.2022.818030.

[31]   I. Nwachukwu *et al.*, "COVID-19 pandemic: age-related differences in measures of stress, anxiety and depression in Canada,"

International Journal of Environmental Research and Public Health, vol. 17, no. 17, pp. 1–10, Sep. 2020, doi: 10.3390/ijerph17176366.

[32] Y. Wang, Y. Di, J. Ye, and W. Wei, "Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China," *Psychology, Health & Medicine*, vol. 26, no. 1, pp. 13–22, Jan. 2021, doi: 10.1080/13548506.2020.1746817.

[33] E. Sojli, W. W. Tham, R. Bryant, and M. McAleer, "COVID-19 restrictions and age-specific mental health—US probability-based panel evidence," *Translational Psychiatry*, vol. 11, no. 1, pp. 1–7, Aug. 2021, doi: 10.1038/s41398-021-01537-x.

BIOGRAPHIES OF AUTHORS
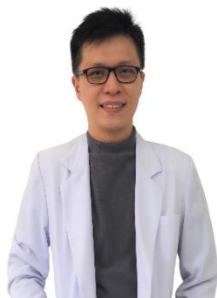
Nicholas Hardi is a lecturer at the School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia. He serves on the Department of Psychiatry and Behavioral Science and counseling team. His interests are in the consultation-liaison psychiatry and geriatric psychiatry fields. Some work on medical students' well-being and behavioral addiction has been done. As a psychiatrist, he worked with the healthcare facilities to provide psychiatric services. He can be contacted at email: nicholas.hardi@atmajaya.ac.id.

Isadora Gracia has been actively involved in teaching and research in biomedical aspects of substance addiction and oral malignancies. One of her publications was "Oral Squamous Cell Carcinoma Positive for HPV Genotypes 16 and 18: A Retrospective Clinicopathologic Study in Yogyakarta, Indonesia". Since 2020, her studies also involved Sars-Cov2 infection and their impacts. Besides teaching, she also works as a dentist specialized in oral medicine. She can be contacted at email: isadora.gracia@atmajaya.ac.id.

Linawati Hananta is an Assistant Professor at the School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia. She is interested in pharmacology, clinical trials, pharmacogenomics, and general medicine. She can be contacted at email: linawati.hananta@atmajaya.ac.id.