Advances in Health Sciences Research, volume 41
Proceedings of the 1st Tarumanagara International Conference on Medicine and Health (TICMIH 2021)

Depression Among Healthcare Workers During the Covid-19 Pandemic

Nurul Salamah[1,] Naomi Soetikno[2,] Roswiyani Roswiyani[3*]

[1,2,3]*Professional Psychology Magister Program, Tarumanagara University, West Jakarta, 11440, Indonesia*
**Corresponding Author. Email : roswiyani@fpsi.untar.ac.id*

ABSTRACT
During the COVID-19 pandemic, healthcare workers have important roles in clinical management. In carrying out this clinical management, a higher rate of depression also occurs in healthcare workers. The high level of depression in healthcare workers during the COVID-19 pandemic might be caused by an increase in workload, fear of being infected, violence and exclusion. This study aims to describe the phenomenon of depression in healthcare workers during the COVID-19 pandemic. This research was conducted in April 2021 involving 419 healthcare workers, which were medical and non-medical personnels. In addition to collecting demographic data, participants also filled out an online questionnaire that measure depression using the Beck Depression Inventory-II, which was adapted into Indonesian language. The results showed that 16.5% of healthcare workers experienced symptoms of depression. Significantly higher rates of depression were experienced by healthcare workers who are under 30 years old, divorced, do not reside with their family and have non-medical professions.

Keywords: *Depression, Healthcare workers, Pandemic, COVID-19.*

1. INTRODUCTION

During the last two decades, there have been 3 respiratory outbreaks occurred worldwide. The first was the SARS-CoV epidemic in 2002 [1], then MERS-CoV in 2012 [2], and the COVID-19 that was declared a pandemic by WHO in 2019 [3). A total of 204 million individuals have been infected with this respiratory virus, and more than 4 million people have died globally [4]. In Indonesia, there are more than 3.7 million people infected and at least 110 thousand have died.

Similar to other outbreaks, COVID-19 puts healthcare workers in an important position in suppressing the spread of this virus [5]. Although Personal Protective Equipment (PPE) has been distributed to healthcare workers, Mitigation Team of the Executive Board of the Indonesian Doctors Association (PB IDI) reported that the death rate, as well as depression rates [7,8,9] amongst the healthcare workers continues to increase [Santosa, 2021], as well as depression rates

The increasing level of depression in healthcare workers can be caused by an increased workload [10], fear of being infected and transmitting infections to their loved ones [11,12,13], as well as experiences of violence [14,15,16,17] and exclusion caused by negative stigma towards the healthcare workers [18,19].

Individuals with major depression experiences sleep disturbances, high levels of financial tension, limitations in physical and occupational functioning, and poor health status [20]. In addition, depression is also a compromise psychosocial functioning such as relationship with family and friends [21,22]. Therefore, it is extremely important to examine this phenomenon.

There have been many studies examining this phenomenon in infected countries in East Asia, Middle East, Europe, South Asia, South America, North America and West Africa [23,24,25]. This study will focus on investigating this phenomenon in Indonesia. Not only inspecting the level of depression in healthcare workers, but this study will also discuss what aspects of

depression that are most commonly experienced by healthcare workers.

2. METHODS

This study recruited 419 healthcare workers, who were employed in the outpatient clinics or emergency departments of healthcare facilities during the COVID-19 pandemic and who met the study criteria. Participants included in this study were those who are between the ages of 18 and above 61 years old, work during the COVID-19 pandemic, domicile in Indonesia and understand the Indonesian language and signed a written informed consent form. All participants included in this study filled out an online questionnaire on Google Form to minimize physical contact due to the COVID-19 infection risks. All participants submitted sociodemographic data form as well as Beck Depression Inventory-II (BDI-II).

2.1. Sociodemographic Data

The sociodemographic data form included information such as age, gender, marital status, domicile, living arrangement, and profession.

2.2. Beck Depression Inventory-II (BDI-II)

Beck Depression Inventory-II (BDI-II), an inventory that was intended to measure depressive symptom was originally created by Beck in 1976 with reference to the depression criteria in the DSM-IV. This inventory was adapted into Indonesian language with a reliability coefficient of 0.90 [26]. Meanwhile, in this study, this measuring instrument has a reliability value of 0.888. BDI-II consists of 21 statement items arranged on an intensity scale of 4 points with a score of 0 to 3. Each score submitted by participants in each item will be added up so that a total score is obtained with a range of values from 0 to 63. Scores in the range of 0 and 13 indicate no depression, 14 to 19 mild depression, 20 to 28 moderate depression, and scores 29 or more indicate severe depression. The higher the score, the higher the level of depression experienced by the individual.

BDI-II measures four aspects of depressive symptoms, such as emotional, cognitive, motivational and vegetative and physical aspects. The emotional aspect measures the presence or absence of symptoms such as sadness, dissatisfaction, feelings of guilt, dislike of oneself, crying and irritability. The cognitive aspect measures the presence or absence of feelings of punishment, self-criticism, doubt in making decisions, the impression of a bad body image, and health anxiety. The motivational aspect measures the presence or absence of feelings of failure, suicidal ideation, withdrawal from association, and work productivity. The last aspect is the vegetative and physical aspects which include the presence or absence of sleep disturbances, fatigue, decreased appetite, decreased body weight and decreased interest in sex.

2.3. Statistical Method

The findings of this study were valuated using the statistical analysis software, SPSS 20 (Statistical Package for Social Sciences) for Windows. Frequency (f), percentage (%), arithmetic mean (X), standard deviation (Sd) were calculated for the analysis of the data. The existence of a statistically significant difference between the independent groups was analysed using t-test for independent samples, when the number of independent groups was two, while one-way analysis of variance (One-Way ANOVA) was utilized when the number of independent groups was more than two. Statistical significance was defined by a value of $p<0.05$.

3. RESULT

A total of 419 participants, 203 medical personnel and 216 non-medical personnel working during COVID-19 were included in the study. The majority of participants were between 22 and 25 years old. The number of female participants was 339 (80,9%) and the number of male participants was 80 (19,1%). Most of the participants were married (64%), reside with a family (59,4%) and domicile in South Sumatera (85%). Sociodemographic data of the participants were presented in table 2.

It was determined that the number of participants without depression was 350 (83,5%), with mild depression was 46 (11%), with moderate depression was 17 (4,1%) and the number of participants with severe depression was 6 (1,4%). Depression levels of the participants were presented in table 1.

Table 1
Depression level in participants.

Depression	Skor	f	(%)
Not Depressed	0 – 13	350	83.5%
Mild	14 - 19	46	11%
Moderate	20 - 28	17	4.1%
Severe	=> 29	6	1.4%
Total		419	100%

Emotional aspect of depression was the one aspect that most commonly experienced by participants (X = 2.22). Followed by a decrease in the cognitive (X = 1.9) and vegetative and physical aspects (X = 1.83). Motivational aspect is the least to occur amongst the participants (X = 0.7).

Age-based comparison of the scale scores for the participants indicates an increase in BDI-II scores for the participants under the age of 30 years old compared

Table 2
Differences in depression rates based on demographic data.

			Depression		Emotional		Cognitive		Motivational		Vegetative & Physical	
	n	**%**	**Mean Rank**	**P**	**Mean Rank**	**P**	**Mean Rank**	**P**	**Mean Rank**	**P**	**Mean Rank**	**P**
Age[1]												
18-21	6	1.4%	10.67		2.83		3.67		2.00		3.00	
22-25	87	20.8%	7.25		2.44		2.24		1.02		1.95	
26-29	72	17.2%	7.11		2.64		2.14		0.75		2.06	
30-33	78	18.6%	7.56		2.91		2.28		0.71		2.03	
34-37	46	11%	5.57		1.87		1.72		0.59		1.85	
38-41	58	13.8%	5.47	0.036	1.86	0.023	1.53	0.116	0.55	0.035	1.86	0.283
42-45	34	8.1%	3.47		1.26		1.15		0.32		0.97	
46-49	11	2.6%	3.91		1.27		1.00		0.27		1.55	
50-53	12	2.9%	4.92		1.83		1.92		0.33		1.17	
54-57	8	1.9%	3.88		1.00		0.88		0.63		1.50	
58-61	4	1%	1.25		0.50		0.00		0.00		0.75	
>61	3	0.7%	1.67		1.00		0.33		0.00		0.33	
Gender[2]												
Male	80	19.1%	6.04	0.731	2.05	0.493	1.85	0.835	0.95	0.047	1.53	0.154
Female	339	80.9%	6.34		2.27		1.92		0.64		1.90	
Marital Status[3]												
Not Married	137	32.7%	7.91		2.72		2.34		1.13		2.15	
Married	268	64%	5.30	0.000	1.96	0.021	1.62	0.003	0.47	0.000	1.59	0.002
Widow	7	1.7%	5.71		1.71		1.57		0.29		2.43	
Divorce	7	1.7%	12.43		3.29		4.43		1.29		4.14	
Domicile[4]												
Aceh	1	0.2%	3.00		1.00		1.00		0.00		2.00	
Banten	4	1%	6.50		4.00		1.25		0.00		2.00	
Bengkulu	2	0.5%	7.00		2.00		1.00		3.50		1.00	
Yogyakarta	2	0.5%	4.50		0.50		1.50		1.50		2.00	
Jakarta	8	1.9%	6.13		1.75		1.63		0.88		2.13	
Jambi	3	0.7%	3.67		1.33		1.00		0.67		0.67	
West Java	11	2.6%	8.27		2.18		2.82		1.00		2.91	
East Java	2	0.5%	6.50		3.50		2.00		0.00		1.50	
Central Java	2	0.5%	9.00	0.937	1.50	0.95	2.50	0.932	2.00	0.208	3.50	0.587
South Borneo	1	0.2%	1.00		1.00		0.00		0.00		0.00	
East Borneo	2	0.5%	7.50		2.50		3.00		1.50		1.00	
Bangka Belitung	6	1.4%	7.00		2.00		2.50		1.33		1.50	
Lampung	11	2.6%	10.18		3.18		3.36		1.09		3.18	
Riau	2	0.5%	12.50		3.50		4.00		1.50		4.00	
South Sulawesi	4	1%	5.00		1.50		1.75		0.75		1.25	
West Sumatera	1	0.2%	0.00		0.00		0.00		0.00		0.00	
North Sumatera	1	0.2%	2.00		0.00		2.00		0.00		0.00	
South Sumatera	356	85%	6.12		2.22		1.84		0.64		1.77	
Living Arrangement[5]												
Nuclear Family	249	59.4%	5.45		1.94		1.64		0.55		1.68	
Extended Family	128	30.5%	6.63	0.001	2.41	0.004	2.03	0.008	0.67	0.000	1.92	0.192
Alone	40	9.5%	10.15		3.43		3.10		1.63		2.43	
With Housemate(s)	2	0.5%	10.00		2.50		3.00		2.50		2.50	
Profession[6]												
Medical Personnel	203	48.4%	5.25	0.003	1.88	0.006	1.44	0.000	0.75	0.792	1.44	0.000
Non-medical	216	51.6%	7.25		2.55		2.34		0.64		2.19	

[1]Mean=5.49, SD=2.247; [2]Mean=1.81, SD=0.349; [3]Mean=1.72, SD=0.578; [4]Mean=29.11, SD=7.468; [5]Mean=1.51, SD=0.686; [6]Mean=1.52, SD=0.5

to other participants of different age (p = 0.036), especially in the emotional and motivational aspects (p = 0.023; p = 0.035). However, gender and domicile did not cause any statistically significant difference.

Depression was also found to be significantly higher for the participants who are divorced and it is the lowest for those who are widowed. There was a statistically significant difference between groups (p = 0.000).

Divorced participants score significantly higher on all aspects of depression, such as emotional, cognitive, motivational and vegetative and physical aspect compared to participants with other maritial status (p = 0.021; p = 0.003; p = 0.000; p = 0.002).

Furthermore, living arrangement-based comparison indicates that those who live alone have a significantly higher score on BDI-II (p = 0.000), especially on the

emotional and cognitive aspect (p = 0.004; p = 0.008). Meanwhile, participants who moved out and live with housemate(s) scored higher on the motivational aspect (p = 0.000).

By comparing medical and non-medical personnel, depression was also found to be higher for the non-medical personnel, such as nurses, pharmacists, and so on. There was a statistically significant difference between these groups (p = 0.003), especially on the emotional (p = 0.006), cognitive (p = 0.000) and vegetative and physical aspects (p = 0.000). Environmental health personnel experienced significantly higher symptoms in cognitive aspects (p = 0.007) and pharmacists experienced higher symptoms in vegetative and physical aspects (p = 0.006).

4. DISCUSSION

This study suggests that the majority of healthcare workers are encountering a considerable degree of depression during the COVID-19 pandemic. The findings of this study show that only 16.5% of healthcare workers experienced depression. Healthcare workers who experienced severe depression were 1.4%, those who experienced moderate depression were 4.1% and those who experienced mild depression were 11%.

However, the rate of depression in healthcare workers in this study was not as high as previously described by [7,8,9]. This could be due to the availability and accessibility of vaccines that were not available last year. This study was conducted on April 17, 2021, when vaccinations distributed to healthcare workers had reached 99.74% for the first dose and 90.14% for the second dose. [27,28]. A recent study stated that 51 percent of respondents suffering from depression were those who had not been vaccinated. Meanwhile, those who had been vaccinated experienced less depression than those who had not received the vaccination or refused to receive the COVID-19 vaccination [29]. It is not yet confirmed whether the level of depression is significantly associated with the vaccination, but the presence of vaccination can be a strong predictor of lower depression symptoms in the participants.

In this study, younger participants, especially those who are under 30 years old, had a higher level of depression than other age groups. This shows that younger healthcare workers are prone to have higher symptoms of depression when compared to older healthcare workers, especially in the emotional and motivational aspects. The results of this study are in line with the previous study by [29,30,31]. According to David Lazer, this could be caused by the more dynamic lifestyle they have, compared to older adults. At this age range, most of them have just finished school, found a new job, started a family, which are all disrupted by the pandemic [29].

In terms of the marital status of the participants, those who were divorced and never remarried had higher levels of depression in all aspects including emotional, cognitive, motivational and vegetative and physical. Divorce causes many negative impacts such as economic problems, disappointment in partners, stress, loss of communication, emergence of hostility, feelings of resentment, anger, blaming parents, sadness, self-blame, feelings of dislike, loss of security and warmth, decreased achievement and aggressiveness, depression, and loneliness [32]. These social and economic problems cause higher rates of depression to occur in divorced individuals, because of the divorce itself [33].

As described in previous research [34], this study also found that participants who live alone were more prone to experiencing higher symptoms of depression, especially in the emotional and cognitive aspects. This can be due to the loneliness felt by most individuals who live alone [35]. It is important to note that between living alone and loneliness, loneliness contributes much more to depression symptom scores than living alone. However, lonely individuals show a higher number of depressive symptoms if they live alone than if they live with other people [35].

The COVID-19 pandemic is a health crisis where more people are affected by emotional disorders than are affected by COVID-19 [36]. This is in line with the findings of this study which states that the emotional aspect is the aspect of depression that is most commonly experienced by healthcare workers. According to previous surveys, fear of contracting COVID-19 is not as high as concerns about the psychological and social impact of the pandemic [37]. This emotional disturbance is caused by factors related to circumstances that occur due to COVID-19, such as the potential for infection and the death of close relatives [38]. As well as economic difficulties, disruption of future plans and associated physical and psychological conditions are also amongst the contributing factors [39].

5. LIMITATION

This study has several limitations. First, this study only focuses on the healthcare profession. Future research is expected to enrich the demographic data, such as by adding the frequency of contact with infected patients, a significant increase in workload, loss of loved ones due to the virus or socioeconomic changes due to the pandemic. Secondly, this study only discusses depression in healthcare workers, and therefore cannot measure whether the severity of depression in healthcare workers is significantly different from depression in the general population.

AUTHORS' CONTRIBUTIONS

All authors conceived and designed the study. N. Salamah acquired the data, performed analyses and took responsibility for the integrity of the data and the accuracy of the data analysis. R. Roswiyani and N. Soetikno critically reviewed the manuscript. All authors contributed to manuscript's revisions. All authors approved the final version of the manuscript for the publication.

ACKNOWLEDGMENTS

The authors would like to thank all the participants for their active participation in the study. We also would like to thank Faculty of Psychology, Tarumanagara University for the support in conducting the research. Meanwhile, we would like to thank Sameera Masyhur for her help with the proofreading process.

REFERENCES

[1] N. Zhong, B. Zheng, Y. Li, L. Poon, Z. Xie, K. Chan, P. Li, S. Tan, Q. Chang, J. Xie, X. Liu, J. Xu, D. Li, K. Yuen, J. Peiris, & Y. Guan, Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2013. Lancet 362, 2003. 1353-1358, DOI: 10.1016/s0140-6736(03)14630-2

[2] A. Zumla, D. Hui, & S. Perlman, Middle East respiratory syndrome. The Lancet, 386(9997), 2015. 995–1007. DOI: 10.1016/s0140-6736(15)60454-8

[3] M. L. Holshue, C. DeBolt, S. Lindquist, K. H. Lofy, J. Wiesman, H. Bruce, C. Spitters, K. Ericson, S. Wilkerson, A. Tural, G. Diaz, A. Cohn, L. Foz, A. Patel, S. I. Gerber, L. Kim, S. Tong, X. Lu, S. Lindstrom, M. A. Pallansch, W. C. Weldon, H. M. Biggs, T. M. Uyeki, & S. K. Pillai, First Case of 2019 Novel Coronavirus in the United States. New England Journal of Medicine, 2020. DOI: 10.1056/nejmoa2001191

[4] "Coronavirus cases:" Worldometer. [Online]. Available:https://www.worldometers.info/coronavirus/. [Accessed: 11-Aug-2021].

[5] Kementerian Kesehatan RI. (2020). Pedoman Pencegahan dan Pengendalian Coronavirus Disease (COVID-19). Available: https://covid19.go.id/storage/app/media/Protokol/REV05_Pedoman_P2_COVID-19_13_Juli_2020.pdf [Accessed: 2-Oct-2020].

[6] D. A. Santosa. Memprihatinkan, Kematian Nakes Akibat Covid-19 Tembus 1.500, 2021, Available: https://www.beritasatu.com/kesehatan/805399/memprihatinkan-kematian-nakes-akibat-covid19-tembus-1500 [Accessed: 11-Aug-2021].

[7] Y. Deng, Y. Chen, & B. Zhang, Different prevalence trend of depression and anxiety among healthcare workers and general public before and after the peak of COVID-19 occurred in China: A meta-analysis. Asian Journal of Psychiatry, 2021, doi.org/10.1016/j.ajp.2021.102547

[8] D. Onchonga, E. Ngetich, W. Makunda, P. Wainaina, D. Wangeshi, & P. Viktoria, Anxiety and Depression due to 2019 SARS-CoV-2 among Frontier Healthcare Workers in Kenya, Heliyon, 2021. doi:10.1016/j.heliyon.2021.e06351

[9] A. Y. Hanggoro, L. Suwarni, S. Selviana, & M. Mawardi, Dampak Psikologis Pandemi Covid-19 pada Tenaga Kesehatan: A Studi Cross-Sectional di Kota Pontianak. Jurnal Kesehatan Masyarakat Indonesia, (15)2, 2021. DOI: 10.26714/jkmi.15.2.2020.13-18

[10] W. Lu, H. Wang, Y. Lin, & L. Li, Psychological status of medical workforce during the COVID-19 pandemic: A cross-sectional study. Psychiatry Research, 288, 2020, 112936. doi:10.1016/j.psychres.2020.112936

[11] J. Zhang, W. Wu, X. Zhao, et.al., Recommended psychological crisis intervention response to the 2019 novel coronavirus pneumonia outbreak in China: a model of West China Hospital. Precision Clinical Medicine, 2020. doi:10.1093/pcmedi/pbaa006

[12] Y. T. Xiang, W. Li, Q. Zhang, Y. Jin, W. Rao, L. N. Zeng, B. J. Hall, Timely research papers about COVID-19 in China. The Lancet, 2020. doi:10.1016/s0140-6736(20)30375-5

[13] P. Fauziah, Memaknai Perjuangan Tenaga Medis, Tidak Bertemu Keluarga Saat Lebaran Demi Tangani Pasien Covid-19. Pikiran Rakyat Depok, 2020. Available: https://depok.pikiran-rakyat.com/nasional/pr-09388526/memaknai-perjuangan-tenaga-medis-tidak-bertemu-keluarga-saat-lebaran-demi-tangani-pasien-covid-19 [Accessed: 2-Oct-2020]

[14] D. O. Purba, Pria Ini Pukuli Tenaga Medis karena Kesal Tak Bisa Ikut Rapid Test. Kompas, 2020. Available: https://regional.kompas.com/read/2020/06/04/19554271/pria-ini-pukuli-tenaga-medis-karena-kesal-tak-bisa-ikut-rapid-test?page=all [Accessed: 2-Oct-2020]

[15] R. R. Patty, Ini Alasan Keluarga Ambil Paksa Jenazah dan Pukul Tenaga Medis. Kompas, 2020.

Available:https://regional.kompas.com/read/2020/06/27/21565251/ini-alasan-keluarga-ambil-paksa-jenazah-dan-pukul-tenaga-medis?page=2 [Accessed: 2-Oct-2020]

[16] R. Belarminus, Tenaga Kesehatan di Surabaya Dilumuri Kotoran Saat Jemput Pasien Corona. Kompas, 2020. Available: https://regional.kompas.com/read/2020/10/01/05290041/tenaga-kesehatan-di-surabaya-dilumuri-kotoran-saat-jemput-pasien-corona [Accessed: 2-Oct-2020]

[17] B. A. Ramadhani, Nakes Diserang, Jenazah yang Dimakamkan di Tegal ternyata positif COVID-19. Suarajawatengah.id, 2020. Available: https://jateng.suara.com/read/2020/09/28/123604/nakes-diserang-jenazah-yang-dimakamkan-di-tegal-ternyata-positif-covid-19?page=all [Accessed: 2-Oct-2020]

[18] Ihsanuddin, Pemerintah Sebut 135 Tenaga Medis Diusir Karena Stigma Negatif. Kompas, 2020. Available: https://nasional.kompas.com/read/2020/07/18/19014101/pemerintah-sebut-135-tenaga-medis-diusir-karena-stigma-negatif [Accessed: 2-Oct-2020]

[19] S. Taylor, C. A. Landry, G. S. Rachor, M. M. Paluszek, & G. J. G. Asmundson, Fear and avoidance of healthcare workers: An important, under-recognized form of stigmatization during the COVID-19 pandemic. Journal of Anxiety Disorders, 2020. 102289. doi:10.1016/j.janxdis.2020.102289

[20] L. L. Judd, M. P. Paulus, K. B. Wells, & M. H. Rapaport, Socioeconomic burden of subsyndromal depressive symptoms and major depression in a sample of the general population. American Journal of Psychiatry, 1996, 153(11), 1411-1417.

[21] R. M. Hirschfeld, D. L. Dunner, G. Keitner, D. N. Klein, L. M. Koran, S. G. Kornstein, M. B. Keller, Does psychosocial functioning improve independent of depressive symptoms? a comparison of nefazodone, psychotherapy, and their combination. Biological Psychiatry, 2002, 51(2), 123–133. doi:10.1016/s0006-3223(01)01291-4 [5] X

[22] E. I. Fried & R. M. Nesse, The Impact of Individual Depressive Symptoms on Impairment of Psychosocial Functioning. PLoS ONE, 2014, 9(2): e90311. doi:10.1371/journal.pone.0090311

[23] Y. Li, N. Scherer, L. Felix & H. Kuper, Prevalence of depression, anxiety and post-traumatic stress disorder in health care workers during the COVID-19 pandemic: A systematic review and meta-analysis. PLoS ONE, 2021, 16(3): DOI: 10.1371/journal.pone.0246454

[24] H. M. Aly, N. A. Nemr, R. M. Kishk, N. M. A. B. Elsaid, Stress, anxiety and depression among healthcare workers facing COVID-19 pandemic in Egypt: a cross-sectional online-based study. BMJ Open, 2021, 11, DOI:10.1136/bmjopen-2020-045281

[25] S. Pappa, V. Ntella, T. Giannakas, V. G. Giannakoulis, E. Papoutsi, & P. Katsaounou, Corrigendum to "Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis", Brain Behavior Immunity. 88, 2020, pp 901–907. DOI:10.1016/j.bbi.2020.11.023

[26] H. Ginting, G. Näringa, W. M. Veld, W. Srisayekti, E. S. Becker, Validating the Beck Depression Inventory-II in Indonesia's general population and coronary heart disease patients. International Journal of Clinical and Health Psychology, 13(3), 2013, pp 235-242. DOI:10.1016/S1697-2600(13)70028-0

[27] T. Nurdiana, Vaksinasi mulai 14 Januari 2021, ini cara daftar & verifikasi vaksinasi corona gratis, Kontan, 2021. Available: https://nasional.kontan.co.id/news/vaksinasi-mulai-14-januari-2021-ini-cara-daftar-verifikasi-vaksinasi-corona-gratis [Accessed: 4-Jun-2021]

[28] S. Mashabi, UPDATE 17 April: 5.889.716 Orang Sudah Disuntik Vaksin Covid-19 Dosis Kedua, Kompas, 2021. Available: https://nasional.kompas.com/read/2021/04/17/17545941/update-17-april-5889716-orang-sudah-disuntik-vaksin-covid-19-dosis-kedua [Accessed: 4-Jun-2021]

[29] R. H. Perlis, J. Green, M. D. Simonson, D. Lazer, M. Baum, K. Ognyanova, J. Druckman, M. Santillana, J. Lin, A. Uslu, & A. Quintana, The COVID States Project #47: Update on COVID-19 vaccine attitudes among healthcare workers, 2021. DOI: 10.31219/osf.io/p4q9h

[30] U. S.Talukder, M. J. Uddin, N. Mohammad Khan, M. M. Billah, T. A. Chowdhury, M. F. Alam, & M. S. Alam, Major depressive disorder in different age groups and quality of life. Bangladesh Journal of Psychiatry, 28(2), 2017, pp 58–61. doi:10.3329/bjpsy.v28i2.32738

[31] S. Yang, S. G. Kwak, E. J. Ko, & M. C. Chang, The Mental Health Burden of the COVID-19 Pandemic on Physical Therapists. International

Journal of Environmental Research and Public Health, 17(10), 2020. doi:10.3390/ijerph17103723

[32] R. Humairah, Dampak perceraian terhadap kondisi psikologis keluarga (Skripsi). Universitas Islam Negeri Ar-Raniry Darussalam, Banda Aceh, 2016.

[33] S. Symoens, S. Van de Velde, E. Colman, & P. Bracke, Divorce and the Multidimensionality of Men and Women's Mental Health: The Role of Social-Relational and Socio-Economic Conditions. Applied Research in Quality of Life, 2013. doi:10.1007/s11482-013-9239-5

[34] S. T. Stahl, S. R. Beach, D. Musa, & R. Schulz, Living alone and depression: the modifying role of the perceived neighborhood environment. Aging & Mental Health, 21, 2016. 10.1080/13607863.2016.1191060.

[35] L. Lim, & E. Kua, Living Alone, Loneliness, and Psychological Well-Being of Older Persons in Singapore. Current gerontology and geriatrics research, 2011. 673181. 10.1155/2011/673181.

[36] A. L. Pedrosa, L. Bitencourt, A. C. F. Fróes, M. L. B. Cazumbá, R. G. B. Campos, S. B. C. S. de Brito, & A. C. S. Silva, Emotional, Behavioral, and Psychological Impact of the COVID-19 Pandemic. Frontiers in Psychology, 2020. DOI: 10.3389/fpsyg.2020.566212

[37] Mental health COVID-19, Survey Results: Understanding People's Concerns About the Mental Health Impacts of the COVID-19 Pandemic, 2020. Diakses pada 31 Juli 2021 dari https://acmedsci.ac.uk/file-download/99436893

[38] B. Pfefferbaum, and C. S. North, Mental health and the Covid-19 Pandemic. The New England Journal of Medicine. 383, 2020, p 510–512. DOI: 10.1056/NEJMp2008017

[39] S. M. D.-U. Islam, M. Bodrud-Doza, R. M. Khan, M. A. Haque, & M. A. Mamun, Exploring COVID-19 stress and its factors in Bangladesh: a perception-based study. Heliyon, 6, 2020. DOI: 10.1016/j.heliyon.2020.e04399

Advances in Health Sciences Research

SERIES HOME

ISSN (Online):
2468-5739

ISSN (Print):
N/A

Series Editor(s):
vacant

NEW CONTENT ALERTS

The proceedings series ***Advances in Health Sciences Research*** aims to publish proceedings from conferences in fields of health sciences and health professions and those addressing the use of science and technology in the delivery of healthcare. Read full Aims & Scope

All proceedings in this series are **open access**, i.e. the articles published in them are immediately and permanently free to read, download, copy & distribute. Each volume is published under the **CC BY-NC 4.0** user license which defines the permitted 3rd-party reuse of its articles. The online publication of each proceedings is sponsored by the conference organizers and hence no additional publication fees are required.

Should you wish to publish a proceedings in this series, then please request a proceedings proposal form by sending an email to contact@atlantis-press.com. Your proposal will be evaluated by a Series Editor(s) and/or a scientific evaluation committee consisting of senior researchers in the relevant field. This is to ensure the integrity and quality of the proceedings that we publish

that we publish.

For any questions about this series, please contact our publishing team.

Latest Volumes

Most Downloaded

Most Cited

Upcoming Volumes

Proceedings of the International Conference on Health and Well-Being (ICHWB 2021)

Editors: Dr. dr. Burhanudin Ichsan; dr. Dodik Nursanto. M Biomed.; drg. Septriyani Kaswindiarti, MDSc, Sp.KGA.; Siti Nurokhmah, S.Gz., M.Sc; Mitoriana Porusia,S.KM., M.Sc.; Ns. Dian Hudiyawati, M.Kep.; Suryo Saputro Perdana, M.Sc.PT;

Volume 49, April 2022

Proceedings of 1st International Conference on Health Sciences and Biotechnology (ICHB 2021)

Editors: Abu Bakar; Rinnita Amelia; Shih-Chieh Lee; Valendriyani Ningrum;

Volume 47, March 2022

Proceedings of the 2nd Aceh International Dental Meeting 2021 (AIDEM 2021)

Editors: Prof. Dr. drg. Boy M Bachtiar, Ph.D; Asst. Prof. Chun-Yen Liu; Dr. Talat Hasan Al-Gunaid, DDS, Ph.D;

Volume 48, March 2022

View More Latest Volumes

Atlantis Press

Atlantis Press – now part of Springer Nature – is a professional publisher of scientific, technical & medical (STM) proceedings, journals and books. We offer world-class services, fast turnaround times and personalised communication. The proceedings and journals on our platform are Open Access and generate millions of downloads every month.

For more information, please contact us at: contact@atlantis-press.com

- PROCEEDINGS
- JOURNALS
- BOOKS
- POLICIES
- MANAGE COOKIES/DO NOT SELL MY INFO
- ABOUT
- NEWS
- CONTACT
- SEARCH

Home Privacy Policy Terms of use

Series: Advances in Health Sciences Research

Proceedings of the 1st Tarumanagara International Conference on Medicine and Health (TICMIH 2021)

PREFACE

The 1st Tarumanagara International Conference on Medicine and Health (TICMIH) 2021 was held by Consortium of Health Science of LLDIKTI Region III collaborated with Untar Institute of Research & Community Engagement (LPPM Untar). It was held online from August 5 to 6, 2021, using Zoom Platform.

The conference brought a topic about “Challenges and Opportunities for Overcoming Infectious Diseases in the 21st Century.” The keynote speakers at this conference were Professor Tania Sorrell, MD., Ph.D., from the University of Sydney, Australia (subtopic: Global trends in emerging infectious diseases – How to manage them) and Dr. dr. Erni J. Nelwan, Sp.PD., Ph.D., from the University of Indonesia (subtopic: Emerging infectious diseases in Indonesia: Where are we now?).

This conference facilitated lecturers, students, and researchers to publish their articles in indexed international proceeding. The scope of the articles included but was not limited to the following: Medicine, Health, Public Health, Infectious Disease & Tropical Medicine, Community Medicine, Dentistry, Pharmacy, Nursing, Nutrition, Obstetrics, and Clinical Psychology.

Articles submitted to TICMIH 2021 was reviewed by expert reviewers before being presented. The results of those reviewed articles were later be further reviewed to be published according to the scientific publication standard

criteria and requirements.

TICMIH 2021 Organizing Committee would like to thank Prof. Dr. Agus Setyo Budi, M.Sc, as the Head of Administration of LLDIKTI Region III at Ministry of Education and Culture of the Republic of Indonesia; Prof. Dr. Agustinus Purna Irawan as the Rector of Tarumanagara University; Ir. Jap Tji Beng, Ph.D. as the Head of LPPM Untar; Dr. dr. Saelan Tadjudin, Sp.KJ as the Dean of Untar Medical Faculty; Dr. dr. Meilani Kumala, MS., Sp.GK(K); Chairperson, members, and PIC of Consortium of Health Science of LLDIKTI Region III; TICMIH 2021 Organizing Committee; the Authors included in this proceeding; and all parties who contributed to this conference.

Jakarta, November, 2021
Organizing Committee
Dr. dr. Arlends Chris, M.Si.

Series: Advances in Health Sciences Research

Proceedings of the 1st Tarumanagara International Conference on Medicine and Health (TICMIH 2021)

ORGANIZERS

Honorary chair

Prof. Dr. Ir. Agustinus Purna Irawan

Universitas Tarumanagara, Indonesia

Steering Committee

Assoc. Prof. Hugeng, MT, Ph.D.

Universitas Tarumanagara, Indonesia

Jap Tji Beng, Ph.D.

Universitas Tarumanagara, Indonesia

Dr. dr. Meilani Kumala, M.S., Sp.GK(K)

Universitas Tarumanagara, Indonesia

Organizing Committee/Chairman

Dr. dr. Arlends Chris, M.Si.

Universitas Tarumanagara, Indonesia

Organizing Committee/Treasurer

Bujung Hong, Dr. med

Department of Neurosurgery Hannover Medical School, Germany

Lawrence Ong, MBBS, Ph.D

Department of Imunology, Westmead Hospital, NSW, Australia

Prof. Herdiman T. Pohan, MD

Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia

Erni J. Nelwan, MD, PhD

Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia

Sharifah Shakinah, MD

Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia

Prof. Saptawati Bardosono, MD, PhD

Cipto Mangunkusumo General Hospital, Faculty of Medicine University of Indonesia

Dr. phil. Edo Sebastian Jaya, M.Psi., Psikolog

Faculty of Psychology, University of Indonesia

Velma Herwanto, MD, PhD

Faculty of Medicine, Universitas Tarumanagara, Indonesia

Atlantis Press

Atlantis Press – now part of Springer Nature – is a professional publisher of scientific, technical & medical (STM) proceedings, journals and books. We offer world-class services, fast turnaround times and personalised communication. The proceedings and journals on our platform are Open Access and generate millions of downloads every month.

For more information, please contact us at: contact@atlantis-press.com

- PROCEEDINGS
- JOURNALS
- BOOKS
- POLICIES
- MANAGE COOKIES/DO NOT SELL MY INFO
- ABOUT
- NEWS
- CONTACT
- SEARCH

Home Privacy Policy Terms of use