

Psychometric assessment of patients with congestive heart failure by using hospital anxiety and depression scale

Hedya Nadhrati Surura¹, Al Bukhari¹, Dizi Bellari Putri², Handy Khairul Fikri³, Neily Maulida Ulfa⁴

¹Emergency Department, Subulussalam General Hospital, Aceh, Indonesia

²Medical Editor Department, Alodokter, Jakarta, Indonesia

³Ophthalmology Emergency Department, Sabang Merauke Eye Center Hospital, Pematangsiantar, Indonesia

⁴Emergency Department, Mitra Medika General Hospital, Medan, Indonesia

Article Info

Article history:

Received Jun 27, 2023

Revised Mar 30, 2024

Accepted Apr 9, 2024

Keywords:

Congestive heart

Depression scale

Hospital anxiety

Prevalence

Psychometric

ABSTRACT

Congestive heart failure (CHF) is a progressive health problem that has increased morbidity and mortality. However, studies on validating measures of anxiety and depression symptoms of CHF patients are still limited. The observational study enrolled 53 CHF patients who visited the Internal Medicine Department of Subulussalam General Hospital, Aceh, Indonesia. By using the total sampling method, the sample inclusion criteria were patients who were diagnosed with CHF and never consumed antidepressants before the diagnosis. Diagnosis data of CHF and its classification were obtained from clinical findings by an internist and evaluation of chest X-ray imaging with CTR>50%. The Hospital Anxiety and Depression Scale (HADS) was used in this study to show the prevalence of patients with depression and anxiety symptoms in Aceh, Indonesia. This finding might be valuable to Indonesian public policy in the context of health services.

This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



Corresponding Author:

Al Bukhari

Subulussalam General Hospital

Jl. Hamzah Fansuri No.118, Subulussalam Sel., Simpang Kiri, Subulussalam, Aceh 24782, Indonesia

Email: albukhari.doctor@gmail.com

1. INTRODUCTION

Congestive heart failure (CHF), also known as heart failure (HF), is a progressive health problem associated with increased morbidity and mortality [1]. In Indonesia, HF is more prevalent among younger individuals compared to Europe and America and often manifests with severe clinical symptoms [2]. Depression is a leading cause of disability worldwide and frequently coexists with HF, posing additional burdens for patient care [3]. Depression in HF patients is linked to worse outcomes, including heightened morbidity, mortality, HF-related hospitalizations, and diminished quality of life [4]. However, depression in HF is often underdiagnosed and inadequately treated [5], [6].

Additionally, heart failure is a clinical syndrome wherein the heart fails to provide sufficient blood supply to peripheral tissues, impairing the body's metabolic demands [7]. Heart failure frequently occurs concomitantly with other pathologies, known as comorbidities, exacerbating the heart failure condition [8], [9]. The distribution of these comorbidities varies across different age groups, with uncontrolled Hypertension being one such comorbidity that further complicates heart failure [10].

Initial observation in the Subulussalam General Hospital, Aceh, Indonesia, revealed that many of the families who accompany the patient for routine control treatment have less enthusiasm, little appetite, are frequently silent, and have trouble sleeping because of CHF. Moreover, CHF can cause comorbid psychiatric diseases, which will exacerbate the course of CHF disease so that it is likely to cause other complications [11]. The psychiatrist was unavailable in the Subulussalam General Hospital, Aceh, Indonesia. Consequently,

patients cannot be consulted with the specialist regarding their grievances. Those situations indicated the importance and urgent need for the hospital anxiety and depression scale (HADS) to evaluate the patient's family accompanying the patient regarding the possibility of depression [12].

Previous studies have extensively explored the relationship between CHF and the presence of depression and anxiety symptoms in patients [13]. Multiple studies have reported a higher prevalence of depression and anxiety symptoms among CHF patients compared to the general population. The prevalence rates vary but have been consistently found to be significantly elevated in CHF patients [3]. A study in 2022 at Pulo Kemiri village, Babussalam, Aceh, reported that the majority of respondents 26-35 years old had moderate anxiety and depression levels [14]. Depression and anxiety symptoms in CHF patients have been associated with a significant decrease in quality of life. These psychological conditions often contribute to a worsened perception of physical symptoms, impaired social functioning, and reduced overall well-being [15]. Depressive and anxiety symptoms in CHF patients have been linked to worse clinical outcomes. These include increased mortality rates, higher rates of hospitalization, more extended hospital stays, and greater healthcare utilization. The relationship between CHF, depression, and anxiety is likely influenced by a complex interplay of biological, psychological, and social factors. Contributing factors may include neurohormonal dysregulation, inflammation, psychosocial stressors, and reduced social support [16]. Even though anxiety and depression have a significant negative influence on CHF patients, these illnesses are frequently misdiagnosed and inadequately managed. Lack of routine screening, insufficient training for healthcare providers, and patient underreporting of symptoms are some obstacles to diagnosis and treatment [17]. According to research, people with CHF who also exhibit symptoms of depression and anxiety may benefit from an integrated care approach that combines the expertise of cardiologists and mental health professionals [1]. Medicine, psychotherapy, self-management techniques, and lifestyle changes may be used as treatment approaches [18]. Overall, previous studies have emphasized the high prevalence, adverse impact, and potential clinical implications of depression and anxiety symptoms in CHF patients [19]. Further research is needed to explore optimal screening methods, effective interventions, and strategies for improving the integration of mental health care into the management of CHF [20].

In this research, we investigated the prevalence of CHF patients who experience anxiety and depression symptoms based on the HADS assessment. This study would also emphasize the correlation between HADS and several descriptive patient backgrounds such as age, sex, New York Heart Association (NYHA) classification, compliance with medication, routine consultation, accompanying disease, Hypertension, and education. The hospital management might consider this study so patients can get further evaluation and proper medical treatment.

2. METHOD

In this observational descriptive study, 53 CHF patients who visited the Internal Medicine Department of Subulussalam General Hospital, Aceh, were enrolled. The inclusion criteria included the patients diagnosed with CHF who had not previously consumed antidepressants. The diagnosis of CHF and the determination of the NYHA classification were based on clinical findings by an internist, as well as the evaluation of chest X-ray imaging (CTR>50%) [21]. Informed consent was obtained from all participants according to the Ethical Approval No. 02/KOMET/LPMKA/2022. The presence of depression and anxiety symptoms was assessed using the Hospital Anxiety and Depression Scale (HADS) [22]. The validity test with Pearson's correlation method ($p < 0.06$) and the reliability test with Cronbach's method ($\alpha > 0.6$) [23]. The measured total scores were utilized to categorize the symptoms as normal, borderline, or abnormal. The primary outcomes of this study focused on determining the prevalence of depression and anxiety symptoms in patients with CHF.

3. RESULTS AND DISCUSSION

The HADS score depression exhibited an extreme prevalence of depression in HF patients, as an abnormal case was found in about 92.4% of 53 respondents. There was no normal score, although Borderline was 7.6%. However, the HADS score anxiety showed normal (62.2%), and borderline (37.7%), and no abnormal case was found. Data are shown in Table 1.

Table 1. Prevalence of depression and anxiety assessed by HADS

Score	HADS score depression (%/respondent)	HADS score anxiety (respondent/%)
Normal: 0-7	0 (0%)	33 (62.2%)
Borderline: 8-10	4 (7.6%)	20 (37.7%)
Abnormal (case): 11-21	49 (92.4%)	0 (0%)
Total respondent		53 (100%)

In more detail, the abnormal case of depression could be explained based on data presented in Table 2. The older people, male gender, and HF class III were correlated to depression cases. Moreover, compliance with medication, as well as routine consultation, were strongly related to depression symptoms. Diabetes mellitus was indicated as the most accompanied disease, as well as hypertension at most [24]. The majority of respondents with depression are low-educated individuals. The most exciting finding was that all respondents showed no symptoms of anxiety. In contrast, a meta-analysis study reported that nearly 30 % of heart failure patients experienced clinically significant levels of anxiety based on anxiety questionnaires [25].

Table 2. Descriptive backgrounds of CHF patients

Descriptive	Abnormal (case) HADS score		
	HADS score depression (responden/%)	HADS score anxiety (responden/%)	
Age	Adult (6) (26-45 y.o)	5 (17%)	0 (0%)
	Elderly (47) (>45 y.o)	44 (83%)	0 (0%)
Sex	Man (35)	34 (64.1%)	0 (0%)
	Women (18)	15 (28.3%)	0 (0%)
NYHA classification	I	12 (22.6%)	0 (0%)
	II	13 (24.5%)	0 (0%)
	III	20 (37.7%)	0 (0%)
	IV	3 (5.6%)	0 (0%)
Compliance on medication	Yes	52 (98.2%)	0 (0%)
	No	1 (1.8%)	0 (0%)
Routine on consultation	Yes	53 (100%)	0 (0%)
	No	0 (0%)	0 (0%)
Accompanying diseases	Diabetes mellitus	13 (24.5%)	0 (0%)
	Coronary artery disease	8 (15%)	0 (0%)
	Chronic obstructive pulmonary disease	7 (13.2%)	0 (0%)
	Others	25 (47.3%)	0 (0%)
Hypertension	Yes	53 (100%)	0 (0%)
	No	0 (0%)	0 (0%)
Education	Elementary	9 (17%)	0 (0%)
	Mid-school	10 (19%)	0 (0%)
	Senior high school	13 (24.5%)	0 (0%)
	College	5 (9.4%)	0 (0%)
	Lack of education	16 (30.1%)	0 (0%)

Patients with heart failure have been associated in several studies with a higher risk of depression and the development of depressive symptoms. Depression in HF is associated with increased mortality and morbidity. A meta-analysis study showed that the combined outcome of death and cardiovascular events was two-fold higher in heart failure patients with depression [26]. It was discovered that depressed symptoms were associated with a two-fold more significant risk of mortality or heart attack in a meta-analysis of eight studies looking at the prospective connection between increasing depressive disorders and HF outcomes [26]. Because of the roles that physiological, cognitive, and social factors play, age appears to have an impact on the rise in depression symptoms in heart failure patients. In populations of people with heart failure, elderly patients and women are at increased risk of developing depression [27]. A study reported that the bereaved individuals who scored low on certainty about mental states reported more symptoms of anxiety and depression; in this context, palliative care is a crucial solution [23].

Although there are certain similarities in the physio-pathological mechanisms, such as elevated levels of catecholamines, cortisol, and inflammatory cytokines (IL-6, IL-1 β , TNF- α), the correlation between depression and congestive heart failure remains somewhat unclear [5]. However, the presence of these factors underscores the clinical and prognostic significance of depression. Notably, depression has a detrimental impact on the patient's quality of life and functional status, leading to reduced physical activity levels and a decline in survival rates [28]. We also discovered, based on the literature, that there is still tiny and ambiguous information available about the connection between heart failure patients and anxiety. In a study concentrating on anxiety symptoms, there was no significant correlation found between anxiety and death in HF patients after adjusting for pertinent demographic and medical characteristics. However, patients who have HF and increased depressive symptoms and the presence of comorbid anxiety increase the risk of adverse cardiac outcomes, including rehospitalization and death [3].

Frequently occurring non-cardiac comorbidities are often disregarded in the routine management of CHF despite their significant impact on hospitalizations and mortality rates. Among the most crucial comorbidities in patients with heart failure are renal insufficiency, diabetes mellitus, chronic obstructive pulmonary disease (COPD), sleep disorders such as obstructive and central apnea syndromes, and anemia [29].

Clinicians and researchers have considered depression and anxiety as essential outcomes in the evaluation of heart failure therapy. A study found that depression in heart failure patients increased 2.5 times in NYHA class III and IV compared to NYHA class I and II. Their results showed that the prevalence of depression with heart failure was most commonly found in patients with heart failure NYHA class III and IV, as much as 54.7% [9]. So, depression is associated with increased risk factors for morbidity and mortality in heart failure patients. This may be due to the disease's severity, symptoms' exacerbation, and the patient's inability to carry out daily activities [30]. Individuals with congestive heart failure commonly experience a diminished quality of life, and the majority of patients face a limited life expectancy, characterized by a high mortality rate within five years of diagnosis. Notably, depression affects a significant portion, approximately one-fifth, of CHF patients, further exacerbating their NYHA functional classification [21]. It is worth highlighting that the prevalence of depression in these patients is two to three times higher compared to the general population [2].

Assessment based on the EuroQol-visual analogue scales (EQ-VAS) method reported that depressed patients with heart failure are better at a higher NYHA class [28]. The EQ-VAS is used in clinical settings to assess health-related quality of life (HRQoL) from the patient's perspective. It is often used in conjunction with the EQ-5D questionnaire, which measures health across five dimensions (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) [31]. A possible explanation for such condition is the improved quality of life by effective cardiac medical interventions [30]. The use of the HADS score in indicating depression and anxiety is categorized as a screening tool that can be relied upon in a diagnostic, simple, and concise approach. However, the lack of the HADS score does not have questions about physical symptoms resembling CHF symptoms [32]. It focuses on anhedonia, so the results are at risk of bias and cannot predict the severity of the diagnosis of depression and anxiety with certainty [33]. However, this questionnaire should not be used as a diagnostic tool for psychiatric disorders but to identify patients who require further psychiatric treatment. This is because HADS is considered lacking in evaluating cognitive symptoms and suicidal ideation in patients [34].

4. CONCLUSION




This study exhibited that the prevalence of depression was found to be substantial among patients with congestive heart failure (CHF). These findings emphasize the importance of implementing a comprehensive management program that addresses depression and anxiety symptoms associated with heart failure. It is feared that depression and anxiety will reduce the quality of life of CHF patients, thereby reducing compliance with medication and causing a less than optimal therapeutic effect. The primary goal of such a program would be to reduce morbidity, mortality, and rehospitalization rates and enhance the quality of life for CHF outpatients. It is recommended to conduct future studies utilizing a cohort design and a larger sample size to investigate further the progression of depression and anxiety in CHF patients, as well as to refine the management program accordingly.

REFERENCES




- [1] J. Leung, "Self-Management Behaviours, Depression, And Anxiety In Heart Failure: A Systematic Review," Toronto Metropolitan University. Thesis, 2021, doi: 10.32920/ryerson.14655888.v1 2021.
- [2] N. Tsabedze, J. L. H. Kinsey, D. Mpanya, V. Mogashoa, E. Klug, and P. Manga, "The prevalence of depression, stress and anxiety symptoms in patients with chronic heart failure," *International Journal of Mental Health Systems*, vol. 15, no. 1, pp. 1–6, 2021, doi: 10.1186/s13033-021-00467-x.
- [3] J. Veskovc *et al.*, "Depression, anxiety, and quality of life as predictors of rehospitalization in patients with chronic heart failure," *BMC Cardiovascular Disorders*, vol. 23, no. 1, pp. 1–11, 2023, doi: 10.1186/s12872-023-03500-8.
- [4] N. Wang, S. Hales, R. Gallagher, and G. Tofler, "Predictors and outcomes of quality of life in elderly patients with heart failure," *American Heart Journal Plus: Cardiology Research and Practice*, vol. 19, no. July, p. 100188, 2022, doi: 10.1016/j.ahjo.2022.100188.
- [5] I. S. Forrest *et al.*, "Genetic and phenotypic profiling of supranormal ejection fraction reveals decreased survival and underdiagnosed heart failure," *European Journal of Heart Failure*, vol. 24, no. 11, pp. 2118–2127, 2022, doi: 10.1002/ejhf.2482.
- [6] J. N. Njoroge and J. R. Teerlink, "Pathophysiology and therapeutic approaches to acute decompensated heart failure," *Circulation Research*, vol. 128, no. 10, pp. 1468–1486, 2021.
- [7] R. Amelia, D. L. Adiputro, A. Biworo, M. Rudiansyah, and O. Illiandri, "Comorbid hypertension at Ulin Hospital Banjarmasin," (in Indonesia), *Homeostatis*, vol. 5, no. 3, pp. 679–689, 2022.
- [8] A. Sitepu, B. Loebis, and M. S. Husada, "Correlation between Indonesian version of montreal cognitive assessment score and hospital anxiety and depression scale scores for post-stroke patients," *Open Access Macedonian Journal of Medical Sciences*, vol. 10, no. T7, pp. 54–58, 2022.
- [9] T. M. T. Pio, J. B. Prihanto, Y. Jahan, N. Hirose, K. Kazawa, and M. Moriyama, "Assessing burden, anxiety, depression, and quality of life among caregivers of hemodialysis patients in indonesia: a cross-sectional study," *International Journal of Environmental Research and Public Health*, vol. 19, no. 8, 2022, doi: 10.3390/ijerph19084544.
- [10] B. B. Tiksnadi, C. P. Iswandi, T. L. Bijaksana, and N. N. D. Wahjoepramono, "Discovering the relationship between anxiety or depression and risk factors of coronary artery disease," *Open Access Macedonian Journal of Medical Sciences*, vol. 11, no. B,

- pp. 5–8, 2023, doi: 10.3889/oamjms.2023.10832.
- [11] R. A. Syafwan, M. J. Simbolon, and V. Camellia, “The correlation between the level of anxiety according to the hospital anxiety and depression scale-anxiety subscale with the duration of illness, the age of the caregiver, and the age of first illness in the biological mother who takes care of boys with,” *Open Access Macedonian Journal of Medical Sciences*, vol. 7, no. 16, pp. 2656–2660, 2019, doi: 10.3889/oamjms.2019.822.
- [12] A. V. Christensen *et al.*, “Psychometric properties of the danish hospital anxiety and depression scale in patients with cardiac disease: results from the DenHeart survey,” *Health and Quality of Life Outcomes*, vol. 18, no. 1, pp. 1–13, 2020, doi: 10.1186/s12955-019-1264-0.
- [13] M. Giezeman, K. Theander, A. B. Zakrisson, J. Sundh, and M. Hasselgren, “Exploration of the feasibility to combine patients with chronic obstructive pulmonary disease and chronic heart failure in self-management groups with focus on exercise self-efficacy,” *Scandinavian Journal Primary Health Care*, vol. 40, no. 2, pp. 208–216, 2022, doi: 10.1080/02813432.2022.2073961.
- [14] S. Handayani and D. Susanti, “Psychological analysis of the community based on the hospital anxiety and depression scale (hads) during the COVID-19 pandemic in Pulo Kemiri Village, Babussalam District, Southeast Aceh Regency,” (in Indonesia), *Jurnal Kesehatan Tambusai*, vol. 3, no. 1, pp. 211–216, Mar. 2022.
- [15] N. A. Gilotra *et al.*, “Caregiver health-related quality of life, burden, and patient outcomes in ambulatory advanced heart failure: A report from revival,” *Journal of the American Heart Association*, vol. 10, no. 14, 2021, doi: 10.1161/JAHA.120.019901.
- [16] Medlineplus25, “Heart Failure.” [Online]. Available: <https://medlineplus.gov/heartfailure.html>. (Accessed: Nov 29, 2023).
- [17] C. Civilotti, D. Acquadro Maran, F. Santagata, A. Varetto, and M. R. Stanizzo, “The use of the Distress Thermometer and the Hospital Anxiety and Depression Scale for screening of anxiety and depression in Italian women newly diagnosed with breast cancer,” *Supportive Care in Cancer*, vol. 28, no. 10, pp. 4997–5004, 2020.
- [18] P. Rebora *et al.*, “Effectiveness of motivational interviewing on anxiety, depression, sleep quality and quality of life in heart failure patients: secondary analysis of the MOTIVATE-HF randomized controlled trial,” *Quality of Life Research*, vol. 30, no. 7, pp. 1939–1949, 2021, doi: 10.1007/s11136-021-02788-3.
- [19] Y. Mo, M. Chu, W. Hu, and H. Wang, “Association between the nurse-led program with mental health status, quality of life, and heart failure rehospitalization in chronic heart failure patients,” *Medicine (United States)*, vol. 100, no. 10, p. E25052, 2021, doi: 10.1097/MD.00000000000025052.
- [20] J. Fitz *et al.*, “Influence of baseline parameters on one-year physical, mental, and health-related quality of life in patients with heart failure and preserved ejection fraction,” *ESC Heart Failure*, vol. 8, no. 6, pp. 4635–4643, 2021, doi: 10.1002/ehf2.13593.
- [21] NYHA, “Classes and stages of heart failure,” *American Heart Association*, 2023.
- [22] A. K. Upadhyaya and I. Stanley, “Hospital anxiety depression scale,” *The British Journal of General Practice*, vol. 43, no. 373, pp. 349–350, 1993.
- [23] V. Lenzo, A. Sardella, A. Musetti, M. C. Petralia, I. Grado, and M. C. Quattropani, “Failures in Reflective functioning and reported symptoms of anxiety and depression in bereaved individuals: a study on a sample of family caregivers of palliative care patients,” *International Journal of Environmental Research and Public Health*, vol. 19, no. 19, 2022, doi: 10.3390/ijerph19191930.
- [24] S. Andriani, E. Effendy, and N. M. S. Nasution, “Factors related to anxiety scores in diabetes mellitus outpatients at the universitas sumatera utara hospital,” *Open Access Macedonian Journal of Medical Sciences*, vol. 9, no. T3, pp. 196–200, 2021, doi: 10.3889/oamjms.2021.6349.
- [25] E. C. Gathright, C. M. Goldstein, R. A. Josephson, and J. W. Hughes, “Depression increases the risk of mortality in patients with heart failure: A meta-analysis,” *Journal of Psychosomatic Research*, vol. 94, pp. 82–89, 2017.
- [26] H. Mulugeta, P. M. Sinclair, and A. Wilson, “Prevalence of depression and its association with health-related quality of life in people with heart failure in low- and middle-income countries: A systematic review and meta-analysis,” *PLoS One*, vol. 18, no. 3 March, pp. 1–17, 2023, doi: 10.1371/journal.pone.0283146.
- [27] M. Sbolli, M. Fiuzat, D. Cani, and C. M. O’Connor, “Depression and heart failure: the lonely comorbidity,” *European Journal of Heart Failure*, vol. 22, no. 11, pp. 2007–2017, 2020, doi: 10.1002/ehfj.1865.
- [28] M. Marthoenis *et al.*, “Quality of life, depression, and anxiety of patients undergoing hemodialysis: Significant role of acceptance of the illness,” *International Journal of Psychiatry in Medicine*, vol. 56, no. 1, pp. 40–50, 2021, doi: 10.1177/0091217420913382.
- [29] S. W. Siddiqui, T. Ashok, N. Patni, M. Fatima, A. Lamis, and K. K. Anne, “Anemia and heart failure: a narrative review,” *Cureus*, vol. 14, no. Id, pp. 1–10, 2022, doi: 10.7759/cureus.27167.
- [30] R. Hosseini, Z. P. Mofrad, E. Ayubi, and F. Najafi, “The effect of self-management-based discharge planning on anxiety, depression, and re-admission in patients with chronic heart failure,” *Evidence Based Care Journal*, vol. 13, no. 2, pp. 46–54, 2023, doi: 10.22038/EBCJ.2023.68925.2807.
- [31] C. Schatz, N. Klein, A. Marx, and P. Buschner, “Preoperative predictors of health-related quality of life changes (EQ-5D and EQ VAS) after total hip and knee replacement: a systematic review,” *BMC Musculoskeletal Disorders*, vol. 23, no. 1, pp. 1–12, 2022, doi: 10.1186/s12891-021-04981-4.
- [32] A. Billis, N. Pandria, S. A. Mouratoglou, E. Konstantinidis, and P. Bamidis, “Development of cognitive and physical exercise systems, clinical recordings, large-scale data analytics, and virtual coaching for heart failure patients: Protocol for the biotechcoach-forall project,” *JMIR Research Protocols*, vol. 9, no. 5, 2020, doi: 10.2196/17714.
- [33] S. Liang, Y. Wu, L. Hanxiaoran, A. J. Greenshaw, and T. Li, “Anhedonia in Depression and Schizophrenia: Brain Reward and Aversion Circuits,” *Neuropsychiatric Disease and Treatment*, vol. 18, no. July, pp. 1385–1396, 2022, doi: 10.2147/NDT.S367839.
- [34] B. B. Tiksnadi, N. Triani, F. Y. Fihaya, I. J. Turu’ Allo, S. Iskandar, and D. A. E. Putri, “Validation of Hospital Anxiety and Depression Scale in an Indonesian population: a scale adaptation study,” *Family Medicine and Community Health*, vol. 11, no. 2, pp. 1–8, 2023, doi: 10.1136/fmch-2022-001775.




BIOGRAPHIES OF AUTHORS

Hedy Nadhrati Surura    is a general practitioner at the Emergency Department of Subulussalam General Hospital, Aceh. She graduated from the Medical Faculty of Malikussaleh University, Aceh. She is a general practitioner at Alodokter, Indonesia's biggest telemedicine start-up company. She has publications in Jurnal Teknologi Laboratorium and Averrous Journal. She is interested in exploring mental illness in rural areas and passionately exploring biomedical science. She can be contacted at hedyanadhrati3@gmail.com.






Al Bukhari    is a general practitioner at the Emergency Department of Subulussalam General Hospital, Aceh. He graduated from the Medical Faculty of Syiah Kuala University, Banda Aceh, and was a Lecturer at the Midwifery Academy of Medika Bakti Persada, Subulussalam, Aceh. He has published in several medical journals, such as the Journal of the Medical Association. He has a specific interest in Radiology and Cardiology. He can be contacted at email: albukhari.doctor@gmail.com.






Dizi Bellari Putri    is a general practitioner with experience as a subinvestigator and researcher in a multinational-scaled new COVID-19 vaccine randomized clinical trial. Currently, she is working as a medical writer at Alodokter, an Indonesia's biggest telemedicine and medical journal start-up company. She graduated from the Medical Faculty of Malikussaleh University, Aceh. She has interest in digital health and passion in contributing to global health improvement. She can be contacted at email: dizibellari@gmail.com.



Handy Khairul Fikri    is a general practitioner at Sabang Merauke Eye Center Hospital, Pematangsiantar Branch, Indonesia. Currently, he works in Ophthalmology Emergency and as Director of Medical Services. He graduated from the Medical Faculty of Malikussaleh University. He has published journals in the Indonesian Ophthalmology Journal, Al-Muslim Health Journal, and Malikussaleh University Journal. He can be contacted at email: fikrihandy49@gmail.com.



Neily Maulida Ulfa    is a general practitioner at Mitra Medika General Hospital, Medan, in the Emergency Dept. She graduated from the Medical Faculty of Syiah Kuala University, Banda Aceh. She is interested in researching Neurology and Internal Medicine. She can be contacted at email: neilymaulidaulfa@gmail.com.