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Heart Failure with Atrial Fibrillation: Physical Domain Severely Compromised Despite Preserved Mental Well-Being


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ARTICLE INFO	ABSTRACT
<p>Article history Received 06 Sep 25 Revised 23 Sep 25 Accepted 04 Oky 25</p> <p>Keywords: Atrial fibrillation, chronic heart failure, quality of life, SF-36.</p>	<p>Atrial fibrillation (AF) frequently coexists with chronic heart failure (CHF), imposing a “double chronic burden” that may severely affect patients’ quality of life (QoL). This study aimed to evaluate QoL in CHF patients with AF using the SF-36 questionnaire, focusing on the most impaired physical and mental domains. A descriptive study was conducted on 30 adult patients (≥40 years) attending the Cardiology Clinic of Mitra Medika Amplas Hospital, Medan. QoL was assessed using the validated Indonesian version of SF-36, and data were analyzed descriptively. The mean age was 62 years, with 70% female, 76.7% having non-valvular AF, and common comorbidities including coronary artery disease (43.3%) and hypertension (33.3%). Physical domains were severely impaired, with role physical (24.17), general health (37.00), and physical functioning (44.00), resulting in a low Physical Component Summary (PCS) of 30.0. In contrast, mental domains were relatively preserved, with mental health (80.93), vitality (80.17), and social functioning (76.35), yielding a Mental Component Summary (MCS) of 57.5. These findings indicate that CHF patients with AF experience substantial physical limitations despite maintained mental well-being, highlighting the importance of interventions targeting physical function while supporting psychosocial health.</p> <p>This is an open access article under the CC-BY-SA license.</p> 

INTRODUCTION

Atrial fibrillation (AF) is a supraventricular arrhythmia characterized by rapid and irregular atrial electrical activity, resulting in the loss of effective atrial contraction. Globally, atrial fibrillation (AF) is one of the most commonly encountered cardiac arrhythmias, and its prevalence increases with age^{1,2}. The 2024 European Society of Cardiology (ESC) Guidelines project that the prevalence of AF will double by 2050 due to the aging population and growing burden of comorbidities.¹ In Indonesia, epidemiological data show a rising incidence of AF, in line with increased life expectancy and the prevalence of structural heart disease³.

AF not only increases the risk of stroke, heart failure, and mortality, but also has a significant impact on patients' quality of life, both physically and psychologically. Symptoms such as palpitations, chest pain, dyspnea, and fatigue can limit daily activities and affect patients' emotional well-being⁴.

Quality of life assessment is an important indicator in the long-term management of chronic patients, including those with AF. One of the widely used instruments is the Short Form-36 Health Survey (SF-36), which evaluates eight health domains: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health. These eight components are further grouped into two main summary components: Physical Component Summary (PCS) and Mental Component Summary (MCS)⁵.

SF-36 is a generic tool applicable across various populations and disease conditions, providing a comprehensive overview of patients' physical and psychological aspects, as well as allowing cross-group comparisons. The instrument is internationally standardized, highly valid and reliable, and has been made available in Indonesian, making it relevant for both research and clinical practice⁵.

Based on local research in Indonesia, the use of the SF-36 questionnaire has shown that atrial fibrillation significantly impacts patients' quality of life. The validation study of the Indonesian version of the Atrial Fibrillation Severity Scale (AFSS) found a significant negative correlation between total AFSS scores and total SF-36 scores, indicating that the more severe the AF symptoms, the lower the overall quality of life⁶. Meanwhile, the validation study of the Indonesian version of the Atrial Fibrillation Effect on Quality of Life (AFEQT) revealed that the daily activities domain has a high correlation with several SF-36 physical domains, including physical functioning, role physical, bodily pain, and PCS, as well as a moderately high correlation with MCS. These findings indicate that in the Indonesian population, atrial fibrillation tends to predominantly affect patients' physical aspects, although mental impairment is also significant⁷.

Although data on quality of life in atrial fibrillation (AF) patients are increasingly available, reports directly using SF-36 in the Indonesian population remain limited, as most studies only employ it to validate AF-specific questionnaires. Consequently, information on mean scores per

domain, value distribution, and factors influencing quality of life in Indonesian AF patients is not yet comprehensively available⁷. This study also uniquely focuses on patients with both chronic heart failure (CHF) and AF, representing a “double chronic burden,” where the coexistence of two chronic cardiovascular diseases intensifies physical impairments, such as fatigue, dyspnea, and exercise intolerance, while also amplifying emotional and mental strain⁸. By analyzing SF-36 scores in this dual-disease population, the study aims to identify the most impaired dimensions of quality of life, providing a more relevant and comprehensive understanding of the multidimensional impact of combined CHF and AF, and highlighting the need for targeted interventions addressing both physical and psychological domains⁸.

METHODS

This study employed a quantitative descriptive design to describe the quality of life of heart failure patients with atrial fibrillation based on SF-36 domains. The study was conducted on outpatients at the Cardiology Clinic of Mitra Medika Amplas Hospital in Medan in May 2025.

The sample size in this study was determined using a single population proportion formula with a 95% confidence level ($Z = 1.96$), an assumed prevalence of impaired quality of life among heart failure patients with atrial fibrillation of 20% ($p = 0.2$), and a precision (d) of 0.15. Substituting these values into the formula $n = Z^2 \times p(1-p) / d^2$ yielded a minimum required sample size of 27 subjects. To account for potential non-response or incomplete data, the number was rounded up to 30. Therefore, this study included 30 patients who met the inclusion and exclusion criteria.

The study subjects were adult patients aged ≥ 40 years diagnosed with AF based on medical records and meeting inclusion and exclusion criteria. Inclusion criteria included patients with an AF diagnosis, aged ≥ 40 years, willing to participate by signing informed consent, and able to complete the questionnaire independently or with minimal assistance. Exclusion criteria included patients with severe neuropsychiatric disorders, terminal conditions, or currently hospitalized.

Data were collected using the validated Indonesian version of the SF-36 questionnaire⁵. The SF-36 questionnaire assesses health-related quality of life across eight domains, each representing a different aspect of physical or mental health. Scores for each domain are first calculated by summing the responses to individual items within that domain, then transforming the raw scores to a 0–100 scale, where higher scores indicate better perceived health. To derive the two summary measures, the Physical Component Summary (PCS) and Mental Component Summary (MCS), domain scores are combined using a weighted scoring algorithm based on factor coefficients established from population norms. PCS primarily incorporates physical functioning, role physical, bodily pain, and general health, while MCS predominantly includes vitality, social functioning, role emotional, and

mental health⁵. Standardized cut-off values for both summary scores are set at 50, with scores below 50 indicating below-average health status and scores above 50 reflecting above-average health status. This method provides standardized measures that allow for comparison across populations and between physical and mental health dimensions.

Data were analyzed descriptively by calculating mean values and standard deviations for each domain and main component (PCS and MCS). No inferential statistical tests were performed because the study aimed to describe characteristics without examining relationships between variables.

This study has received ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, Universitas Muhammadiyah Sumatera Utara, with approval number 1504/KEPK/FKUMSU/2025. All research procedures were conducted in accordance with applicable health research ethics guidelines, and participants provided written informed consent prior to their involvement in the study.

RESULTS

The study included 30 patients, with an average age of 62 years, most of whom were older adults. Women made up the majority of participants (70.0%), while men accounted for 30.0%. In terms of etiology, non-valvular atrial fibrillation was more common (76.7%) compared to valvular atrial fibrillation (23.3%).

The clinical characteristics of the study population were assessed using several key variables. Etiology of atrial fibrillation was categorized into valvular and non-valvular types. Left ventricular ejection fraction (LVEF) was measured by echocardiography using either the Teichholz or Simpson's method, according to the clinician's preference, to evaluate systolic function. For descriptive purposes, patients were then categorized into three groups: reduced LVEF (<40%), mildly reduced LVEF (40–50%), and preserved LVEF (>50%). Stroke risk was determined using the CHA₂DS₂-VASc score, which incorporates clinical factors such as age, sex, history of hypertension, diabetes mellitus, heart failure, vascular disease, and prior stroke or transient ischemic attack. Comorbid conditions were also documented, including coronary artery disease in 13 patients, hypertension, diabetes mellitus, chronic obstructive pulmonary disease, chronic kidney disease or renal insufficiency, and a history of stroke.

The distribution of CHA₂DS₂-VASc scores showed that most patients had moderate to high risk, with the largest proportions at scores 3 (40.0%) and 4 (40.0%). Regarding comorbidities, coronary artery disease (CAD) was found in 43.3% of patients, hypertension in 33.3%, and diabetes mellitus in 13.3%. Additionally, some patients had other comorbidities such as chronic obstructive pulmonary disease (COPD) (16.7%), chronic kidney disease or renal insufficiency (10.0%), and history of stroke (3.3%). These findings indicate that most patients had a considerable comorbidity

burden, consistent with the general characteristics of AF patients in clinical practice. Study subject characteristics are presented in Table 1.

Table 1. Study Subject Characteristics

<i>Characteristic</i>	<i>Value</i>
Age (years)	62 (mean)
Sex	Male: 9 (30.0%) Female: 21 (70.0%)
Etiology	Valvular AF: 7 (23.3%) Non-Valvular AF: 23 (76.7%)
Left Ventricular Ejection Fraction	EF <40%: 7 (23.3%) EF 41–50%: 1 (3.3%) EF >50%: 22 (73.3%)
CHA ₂ DS ₂ -VASc Score	0: 0 1: 1 (3.3%) 2: 5 (16.7%) 3: 12 (40.0%) 4: 12 (40.0%)
Comorbidities	CAD: 13 (43.3%) Hypertension: 10 (33.3%) DM: 4 (13.3%) COPD: 5 (16.7%) CKD/Renal insufficiency: 3 (10.0%) History of stroke: 1 (3.3%)

The analysis of quality of life from this study showed that scores varied considerably across different domains. For interpretation, SF-36 scores were classified as poor (≤ 33), moderate (34–66), and good (≥ 67). The highest scores were observed in mental health (MH, 80.93) and vitality (VT, 80.17), which fall into the good category, indicating that most patients still perceived themselves as having relatively good energy levels and psychological status. Other domains with

relatively good scores included social functioning (SF, 76.35), suggesting that patients' social interactions were well preserved. Conversely, the lowest scores were found in role physical (RP, 24.17, poor) and general health (GH, 37.00, moderate), reflecting significant limitations in daily physical activities and a negative perception of overall health. Physical functioning (PF, 44.00) also fell within the moderate range, reinforcing the physical limitations experienced by AF patients. The summary scores indicated a PCS of 30.0 (poor), confirming that physical-related quality of life was low, while MCS was 57.5 (moderat), suggesting that patients' mental-psychological aspects were better preserved than their physical aspects.

Table 2. Mean Scores of Quality of Life Domains and Main Components in AF Patients

Domain / Main Component	Mean Score
Physical Functioning (PF)	44.00
Role Physical (RP)	24.17
Bodily Pain (BP)	53.17
General Health (GH)	37.00
Vitality (VT)	80.17
Social Functioning (SF)	76.35
Role Emotional (RE)	60.00
Mental Health (MH)	80.93
Physical Component Summary (PCS)	30.0
Mental Component Summary (MCS)	57.5

DISCUSSION

The results show that heart failure patients with atrial fibrillation (AF) experience a reduction in quality of life primarily influenced by physical aspects. Physical functioning, role physical, and general health scores were generally low, reflecting significant limitations in daily activities. Physiologically, AF causes loss of effective atrial contraction, decreased ventricular filling (atrial kick), and heart rate variability, reducing cardiac pump efficiency. In heart failure patients,

especially those with reduced ejection fraction, this further decreases cardiac output, lowering functional capacity. Consequently, patients easily experience fatigue, exercise intolerance, and dyspnea with minimal exertion⁸.

These findings are consistent with more recent studies highlighting the persistent burden of atrial fibrillation on quality of life. The NEAT-HFpEF trial demonstrated that AF patients with HFpEF experienced significant limitations in physical activity that translated into impaired health-related quality of life⁸. More recently, a randomized trial of AF ablation in HFpEF patients showed that catheter ablation significantly improved symptoms, exercise capacity, and quality of life compared with medical therapy alone, indicating that the restoration of sinus rhythm and reduction of AF burden can lead directly to better quality of life⁹. A recent meta-analysis of randomized controlled trials evaluating first-line therapy for symptomatic AF compared cryoablation with antiarrhythmic drug therapy. The study showed that patients who underwent cryoablation reported significantly greater improvements in atrial fibrillation-specific quality of life, as measured by the AFEQT questionnaire and EQ-VAS scores, along with better symptom control and treatment satisfaction compared to those receiving antiarrhythmic drugs. In Indonesia, the validation of the Indonesian version of the AFEQT questionnaire confirmed that more than half of AF patients experienced notable quality-of-life impairments, particularly in younger individuals, women, and those with comorbidities⁷.

In contrast, bodily pain scores were relatively higher than other physical domains, suggesting that pain is not a primary complaint in AF patients with heart failure, unlike dyspnea and palpitations. This is consistent with Lancini et al. who found that chest pain in AF patients is more often associated with coronary artery evaluation than directly caused by AF¹¹.

Interestingly, vitality and social functioning domains showed relatively high scores. Patients reported sufficient energy and the ability to maintain social interactions. This phenomenon may be influenced by psychosocial factors, including family support and adaptation to chronic conditions. Qualitative studies by McCabe et al. support this, showing that AF patients often develop coping mechanisms that allow them to maintain social functioning despite physical limitations¹².

Additionally, mental health scores in this study were also relatively good, indicating that patients did not experience significant depression or anxiety despite physical limitations. Socio-cultural factors, religiosity, and family roles in Indonesia may help maintain mental stability¹³.

Role emotional domain scores were moderate (mean RE 60.00) suggesting some emotional impact, though not as pronounced as physical impact. This contrasts with Bang et al¹⁴. who reported that AF symptom clusters, such as fatigue, low energy, insomnia, and dyspnea, were closely related to increased anxiety, depression, and significantly reduced quality of life. Differences may be explained by coping mechanisms, as reported by Minjie et al ¹⁵, where patients' perceptions of

illness play a key role in determining quality of life, with emotional symptoms and coping strategies as main mediators. Religiosity is also relevant, as Firdaus¹⁶ found that involvement in religious activities and spiritual beliefs supports mental health and enhances emotional resilience in individuals with chronic disease burden.

Looking at summary scores, the study found low PCS but relatively high MCS, reinforcing that AF patients in Indonesia are more affected by physical limitations than mental aspects. Tsounis et al. (2012) in Greece also reported correlations between low PCS and ventricular dysfunction and NYHA functional class, highlighting the importance of hemodynamic status in determining quality of life.

Looking at summary scores, the study found low PCS but relatively high MCS, reinforcing that AF patients in Indonesia are more affected by physical limitations than mental aspects. A recent retrospective cohort study in Colombia found that AF patients with reduced ejection fraction (HFrEF) were more likely to remain in worse NYHA functional class and had significantly worse physical QoL over time.¹⁷ Another community-based study among older adults with AF also showed that symptomatic AF is associated with substantially lower PCS compared to controls, even when MCS is less markedly changed¹⁸.

In addition to optimal medical therapy, interventional strategies such as catheter ablation have emerged as effective approaches to enhance quality of life in patients with atrial fibrillation, particularly by alleviating symptom burden and improving functional capacity. Meta-analysis by Kim et al¹⁹. demonstrated significant increases in PCS (≈ 6.33) and MCS (≈ 7.80) scores after ablation. Allan et al²⁰. further confirmed that catheter ablation improves both physical and mental health in the short term better than antiarrhythmic therapy. These findings suggest that patients with significant quality-of-life impairment, especially those with severe symptoms, may be considered for aggressive interventions to improve long-term clinical outcomes.

CONCLUSION

This study demonstrates that in heart failure patients with atrial fibrillation, quality of life is most impaired in physical aspects, which is reflected by low Physical Functioning, Role Physical, General Health, and PCS scores, while mental aspects are relatively preserved, with high Vitality, Social Functioning, Mental Health, and MCS scores. This confirms that AF has a greater impact on daily physical functioning than psychological condition, with social support and coping helping maintain mental quality of life. Clinically, interventions should focus on improving physical capacity through therapy and rehabilitation, while maintaining patients' psychosocial well-being.

REFERENCES

1. Van Gelder IC, Rienstra M, Bunting KV, et al. 2024 ESC Guidelines for the management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2024;45(36):3314-3414. doi:10.1093/eurheartj/ehae176
2. Lindberg T, Sanmartin Berglund J, Wimo A, Qiu C, Bohman DM, Elmståhl S. Prevalence of Atrial Fibrillation and Long-Term Survival of Older Adults; Findings from the SNAC Study. *Gerontol Geriatr Med*. 2024 Dec 3;10:23337214241304887. doi:10.1177/23337214241304887. PMID: 39628548; PMCID: PMC11613291.
3. Yuniadi, Y., Supit, A. I., Hanafy, D. A., et al. (2024). Prevalence of atrial fibrillation based on tertiary hospital survey in Indonesia: A smartphone-based diagnosis. *Journal of Arrhythmia*, 40(5), 1102–1107.
4. Hindricks, G., Potpara, T., Dagres, N., et al. (2021). 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association of Cardio-Thoracic Surgery (EACTS). *European Heart Journal*, 42(5), 373–498.
5. Salim, S., Yamin, M., Alwi, I. (2017). Validity and reliability of the Indonesian version of SF-36 quality of life questionnaire on patients with permanent pacemakers. *Acta Medica Indonesiana*, 49(1), 10–16.
6. Salim, S., Setiati, S., Pudianto, A. P., et al. (2023). Validity and reliability studies of the Indonesian version of Atrial Fibrillation Severity Scale (AFSS). *BMC Cardiovascular Disorders*, 23, 216.
7. Zulmiyusrini, P., Yamin, M., Muhadi, M., et al. (2023). The validity and reliability of the Indonesian version of atrial fibrillation effect on quality of life (AFEQT) questionnaire for atrial fibrillation patients. *Journal of Patient-Reported Outcomes*, 7(1), 133.
8. Patel, R. B., Vaduganathan, M., Felker, G. M., et al. (2019). Physical activity, quality of life, and biomarkers in atrial fibrillation and heart failure with preserved ejection fraction (NEAT-HFpEF trial). *American Journal of Cardiology*, 123(10), 1660–1666.
9. AlTurki A, Andrade JG, Macle L, et al. Atrial fibrillation ablation for heart failure with preserved ejection fraction: A randomized controlled trial. *Circulation*. 2023;147(11):798-809.
10. Jiang Y, Wang Y, Chen G, et al. Quality of life and safety outcomes after first-line cryoablation versus antiarrhythmic drug therapy in atrial fibrillation: A meta-analysis of randomized controlled trials. *Europace*. 2024;26(3):456-65.
11. Lancini, D., Greenslade, J., Martin, P., et al. (2022). Chest pain workup in the presence of atrial fibrillation: impacts on troponin testing, myocardial infarction diagnoses, and long-term prognosis. *European Heart Journal Acute Cardiovascular Care*, 11(10), 772–781.
12. Zheng M, Xie Z, Shi X, Qu S. Mediating effect of coping strategy and psychological status between illness perception and quality of life among patients with atrial fibrillation: a cross-sectional study. *BMC Cardiovasc Disord*. 2024;24(1):504. doi:10.1186/s12872-024-04176-4
13. Lukman, N. A., Merry, L. (2023). Religion, support and self-care experiences: A qualitative descriptive study with Indonesian adults with chronic disease living in Montreal, Canada. *Journal of Advanced Nursing*, 79(5), 1765–1777.
14. Bang, M., Kim, H., Kim, J. (2023). Symptom clusters, anxiety and depression, and quality of life in patients with atrial fibrillation. *Healthcare (Basel)*, 11(9), 1353.
15. Minjie, Y., Siyi, Z., Lin, H., et al. (2024). Illness perception, emotional symptoms, coping strategies and health-related quality of life in patients with atrial fibrillation. *BMC Cardiovascular Disorders*, 24, 4176.
16. Firdaus, Z. K. (2023). Religiusitas sebagai prediktor terhadap kesehatan mental: studi terhadap pemeluk agama Islam. *Aisyah Journal of Intellectual Research in Islamic Studies*, 3(2), 120–133.
17. García-Salazar LA, Latorre-Velásquez LA, Hernández N, et al. Atrial fibrillation and heart failure: Synergistic effect on functional class and quality of life. *Rev Colomb Cardiol*. 2024;31(4):393-401. doi:10.1016/j.rccar.2024.03.002
18. Suzuki S, Sagara K, Otsuka T, et al. Depression and quality of life in older adults with atrial fibrillation: A cross-sectional community-based study. *J Cardiol*. 2022;80(1):51-57. doi:10.1016/j.jjcc.2022.04.004
19. Kim, Y. G., Han, K. D., Choi, J. I., et al. (2016). Impact of radiofrequency catheter ablation on health-related quality of life and healthcare resource utilization in patients with atrial fibrillation. *PLoS One*, 11(10), e0163755.

20. Allan, K. S., Deyell, M. W., Andrade, J. G., et al. (2020). Catheter ablation for atrial fibrillation improves quality of life: a meta-analysis of randomized controlled trials. *Canadian Journal of Cardiology*, 36(11), 1765–1774.