Relationships between mental health literacy and stress, depression, and anxiety among patients with chronic heart failure in a cardiac outpatient department

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ABSTRACT

This cross-sectional analytical study investigated the relationships between mental health literacy and stress, depression, and anxiety in chronic heart failure patients within a cardiac outpatient department. A simple random sample of 116 patients was included. Data were collected using questionnaires covering participant demographics, clinical information, and mental health aspect. The content validity (IOC) ranged from 0.67 to 1, and reliability, assessed using Cronbach's alpha coefficient, was 0.78 to 0.90. Data were analyzed by descriptive statistics and Pearson's correlation statistics. Findings reveal an average participant age of 60.86±12.98 years, with a male majority (66.38%). Mean scores were: mental health literacy component 184.28±23.38, stress 3.15±2.32; depression 7.83±4.84, and anxiety 52.27±11.58. Significant negative correlation existed between mental health literacy and stress (r = -0.306, p<0.001), depression (r = -0.590, p<0.001), and anxiety (r = -0.574, p<0.001). The study indicated that mental health literacy was at a good level among chronic heart failure patients, demonstrating a negative association with stress, depression, and anxiety. Therefore, cardiac outpatient departments could integrate care management strategies to promote mental health literacy and mitigate stress, depression, and anxiety in these patients.

Keywords: mental health literacy; stress; depression; anxiety; heart failure

1. INTRODUCTION

Chronic heart failure (CHF) is a significant cause of morbidity and mortality globally, posing a significant public health challenge in virtually every country. It is a serious, chronic, and progressive disorder of the heart's functions that affects every aspect of a patient's life and every part of the body. Patients with CHF face numerous debilitating symptoms, making it a debilitating condition.

CHF predominantly arises due to the body's adaptive response to the heart's reduced ability to propel sufficient blood volume, leading to inadequate cardiac output relative to the hemodynamic requirements of the body. Consequently, patients with CHF often experience physical, mental, economic, and social hardships due to these underlying abnormalities. Patients with CHF may also experience common mental disorders such as stress, depression, and anxiety as a result of their illness. The

limitations imposed on daily activities and the feeling of being a burden also negatively affect their quality of life. A meta-analysis conducted by Rutledge et al. (2006) revealed that the prevalence of depression in patients with heart failure is as high as 22%. Depression is a significant factor that can double the risk of complications and mortality among patients with heart failure (O'Connor et al., 2008; Rutledge et al., 2006). Additionally, depression can impact the cost of medical treatment and result in a considerable reduction in the quality of life for patients (Baumeister et al., 2011; Samartzis et al., 2013). Therefore, the screening and management of mental disorders in patients with CHF are crucial considerations for healthcare providers.

Mental health literacy (MHL) is a concept initially introduced by Jorm et al. (1997). It refers to a person's knowledge and beliefs about mental health problems that enable them to recognize, manage, or prevent such issues. The definition of MHL was updated and revised in 2012. It now encompasses knowledge that can benefit the mental health of individuals and others, including ways to prevent mental health problems, awareness of the disorders associated with mental health problems, and knowledge of strategies for seeking help, treating, and coping with mental health issues. MHL encompasses comprehension of effective self-help methodologies for managing severe mental health conditions, alongside fundamental competencies in aiding individuals affected by such conditions (Jorm, 2012). Moreover, MHL entails being well-versed in strategies to offer support to oneself or others navigating mental health challenges, which includes proficiently managing such challenges. Furthermore, it encompasses an understanding of effective methods to promote the mental well-being of families (Reavley et al., 2012). Thus, individuals who possess sufficient MHL are more likely to manage and prevent their own mental health problems effectively. Additionally, research on preventing and managing mental health problems in patients with chronic heart failure remains limited.

Limited studies have examined MHL and the association between MHL and mental disorders in patients with CHF. Consequently, the researcher is keen on investigating MHL, mental disorders in CHF patients, and the correlations between MHL and mental disorders in this population. The objectives of this study were to assess the level of MHL among CHF patients in the cardiology outpatient clinic of the Chest Disease Institute, and to investigate the correlation between MHL and levels of stress, depression, and anxiety among CHF patients in the same setting.

2. MATERIALS AND METHODS

2.1 Study design and participants
This study was an analytical cross-sectional study, and the data were collected between March 27, 2020 and March 20, 2021. The population for this study consisted of 6,090 patients with CHF who visited the cardiology outpatient clinic at the Chest Disease Institute. The sample of patients with CHF in a cardiology outpatient clinic at the Chest Disease Institute in this research comprised 116 individuals. The sample size was calculated using the Epi Info™ application (Division of Health Informatics and Surveillance, 2018), based on a population size of 6,090 people, as reported in a meta-analysis by Rutledge et al. (2006). The acceptable margin of error of 5% at a confidence level of 80% was set, resulting in a required sample size of 111 people. To prevent incomplete data, the sample size was increased by 5%, and a total of 116 people were selected to participate in the study. The inclusion criteria for participants were: patients (1) with CHF who had been attending the cardiology outpatient clinic at the Chest Disease Institute for more than one year, (2) who could communicate easily in Thai, (3) did not have neuropsychiatric disorders, and (4) agreed to participate in this study. The exclusion criterion was patients with CHF experiencing acute illnesses requiring transfer to another acute care hospital.

The sampling method used in this study was simple random sampling. All members of the population were assigned identification numbers, and in this case, the hospital number was used to label each patient. The researcher then drew one number at a time until the required sample size was reached. To ensure that each individual had an equal chance of being randomly selected for the sample, each label chosen was immediately returned to the total population of candidates for selection.

2.2 Measures and data collection

2.2.1 General information and clinical information questionnaire
a. Personal information, including gender, age, marital status, highest level of education, occupation, income sufficiency, alcohol consumption, and smoking status.
b. Clinical information, including symptom severity (as measured by the New York Heart Association functional classification: NYHA FC), left ventricular ejection fraction (LVEF), comorbidities, and duration of chronic heart failure.

2.2.2 MHL assessment form
The researcher adapted the MHL questionnaire for the elderly by Posai et al. (2021), based on the concept of Jorm (2000). The adapted questionnaire consists of six elements, with 10 questions per element. The 60 questions are closed-ended and answered on a 5-point Likert scale (1 = least knowledgeable to 5 = most knowledgeable), and it takes approximately 20 min to complete.

2.2.3 The stress assessment form (ST5)
The stress assessment form (ST5) from the Department of Mental Health, Ministry of Public Health, was utilized for this study. This is a 4-level rating scale consisting of 5 items, with scoring criteria ranging from 0 (rarely) to 3 (regularly), resulting in a score range of 0-15 points. The results were divided into 4 levels: 0-4 indicating less stressful, 5-7 indicating moderately stressful, 8-9 indicating very stressful, and 10-15 indicating the most stressful.

2.2.4 Depression assessment
For depression assessment, questions were adapted from the 10-item Center for the Epidemiological Studies of Depression Short Form (CES-D-10) (Andresen et al., 1994). It is a 4-point scale of 10 items, with a scoring criterion ranging from 1 point (never felt at all or rarely (less than 1

day) to 4 points (feeling it very much or almost all the time (5-7 days). A score of 10 or higher indicates depression, while a score below 10 indicates no depression.

2.2.5 Anxiety assessment

Questions were adapted from the State-Trait Anxiety Inventory form Y-1 (STAI form Y-1) by Spielberger et al. (1983) and translated into Thai by Thapinta (1991). The questionnaire consists of 20 items, including 10 positive and 10 negative statements, rated on a 4-point scale. Negative feelings are scaled from 1 point (not at all) to 4 points (the most severe), while positive feelings are scored from 1 (not at all), to 4 points (the most intense). Scores of 20-40, indicate mild anxiety, 41-60 indicate moderate anxiety, 61-70 indicate high anxiety, and 71-80 indicate severe anxiety.

The research tools were validated by three specialists: a medical professional specializing in Cardiac Medicine, a professional nurse with expertise in health behavior, and a cardiac patient. The content validity (IOC) ranged from 0.67 to 1, ensuring the quality of the tools. Reliability was tested using the modified questionnaire with a sample of 30 chronic heart failure patients, similar to the study population. Cronbach's Alpha coefficient, ranging between 0.78 and 0.90, was used to evaluate the questionnaire's reliability.

2.3 Data analysis

The data were analyzed using the IBM SPSS Statistics 23 program. Descriptive statistics were used to analyze participant characteristics and study variables. Pearson's correlation analysis was conducted to examine the relationships among the study variables. Results were considered statistically significant when the *p*-value was less than 0.05.

2.4 Ethical considerations

This research received approval from the Human Research Ethics Committee of the Chest Disease Institute, Department of Medical Services, Ministry of Public Health (certification document number 070/2563, issued on March 26th, 2020). Participants provided informed consent prior to their participation in the study. Data collection ensured privacy and confidentiality, with findings presented in a general manner.

3. RESULTS AND DISCUSSION

The sample had an average age of 60.86±12.98 year, with most participants over 60 years old. Among the sample, 66.38% were male and 33.62% were female. In terms of marital status, 70.70% were single, while 17.20% were married. Regarding education, 35.34% had a middle school education. With respect to occupation, 21.55% engaged in trade. Half of participants came from families with sufficient income but no savings; 83.62% reported no alcohol consumption, and 90.52% reported no smoking. The majority of participants (75.86%), had NYHA FC Class II symptom severity, and 67.24% had comorbidities. In addition, 82.76% reported a duration of CHF illness of between 1-5 years, and 58.62% had a left ventricular ejection fraction (LVEF) of less than 40% (Table 1).

Table 1. General information and clinical information data of participants (n=116)

Characteristics	n (%)
Gender	
Male	77 (66.38)
Female	39 (33.62)
Age (year) Mean=60.86±12.98, Min=24, Max=88	
< 60	46 (39.66)
≥ 60	70 (60.34)
Marital status	
Single	82 (70.70)
Married	20 (17.20)
Widowed/divorced/separated	13 (11.20)
Not specified	1 (0.90)
Highest level of education	
No school	5 (4.31)
Elementary school	37 (31.90)
Middle school	41 (35.34)
High school	27 (23.28)
≥High school	5 (4.31)
Not specified	1 (0.86)
Occupation	
Agriculture	12 (10.34)
Trade	25 (21.55)
Contractor	21 (18.10)
Pensioner	13 (11.21)
None	16 (13.79)
Not specified	29 (25.00)
Families' income sufficiency	
Sufficient income	47 (40.52)
Sufficient income but no savings	58 (50.00)
Insufficient income	11 (9.48)
Alcohol consumption	
No consumption	97 (83.62)
< 1 time/week	12 (10.34)
2-3 time/week	5 (4.31)
> 4 time/week	2 (1.72)
Smoking status	
No smoking	105 (90.52)
≤ 1 pack/day	9 (7.76)
> 1 pack/day	2 (1.72)
NYHA FC*	
Class I	22 (18.97)
Class II	88 (75.86)
Class III	6 (5.17)
Left ventricular ejection fraction	
<40% (HFrEF)	68 (58.62)
40-49% (HFmrEF)	25 (21.55)
≥50% (HFpEF)	23 (19.83)
Comorbidities	
Yes	78 (67.24)
No	38 (32.76)
Duration of illness with CHF (year)	
1-5	96 (82.76)
6-10	16 (13.79)
> 10	4 (3.45)

Note: *NYHA FC = New York Heart Association Functional Classification

Overall, the level of MHL was moderate with an average score of 184.28±23.38. The components with the highest scores in MHL were attitudes that supported perception and seeking of appropriate help (38.99±6.76). Components with moderate scores in MHL were knowledge and beliefs about risk factors and their causes (28.65±5.24), knowledge and beliefs about professional help (32.84±6.15), and knowledge and belief about self-help (33.47±7.04). The components with the lowest scores on MHL were knowledge regarding searching for mental health information (24.74±12.08) and an individual's ability to perceive abnormalities or psychological distress (25.58±7.47) (Table 2).

The sample group had an average stress score of 3.15±2.32 with the majority (76.72%) reporting low levels of stress, followed by moderate stress (18.97%). The average depression score was 7.83±4.84), with 32.76% reporting some degree of sadness; however, the majority of the sample (67.24%) reported no depression. The average anxiety score was 52.27±11.58), with most subjects reporting moderate anxiety (59.48%), followed by mild and high anxiety, both at 17.24% (Table 3).

The correlation between MHL and stress was moderate and negative ($r = -0.306$, $p<0.001$). The correlation between MHL and depression was high and negative ($r = -0.590$, $p<0.001$). Similarly, there was a statistically significant negative correlation between MHL and anxiety ($r = -0.574$, $p<0.001$) (Table 4).

Table 2. The level of MHL (n=116)

Variables	Range (min - max)	Mean±S.D.	Level
Mental health literacy	131-251	184.28±23.38	Moderate
1. Individual's ability to perceive abnormalities or psychological distress	10-45	25.58±7.47	Lowest
2. Knowledge and beliefs about risk factors and their causes	18-43	28.65±5.24	Moderate
3. Knowledge and belief about self-help	19-49	33.47±7.04	Moderate
4. knowledge and beliefs about professional help	18-50	32.84±6.15	Moderate
5. Attitudes that supported perception and seeking of appropriate help	15-50	38.99±6.76	High
6. Knowledge regarding searching for mental health information	10-50	24.74±12.08	Lowest

Table 3. The level of stress, depression, and anxiety (n=116)

Variables	Range (min - max)	Mean±SD	n (%)
Stress	0.00-12.00	3.15±2.32	
Low (Score = 0-4)			89 (76.72)
Moderate (Score = 5-7)			22 (18.97)
High (Score = 8-9)			2 (1.72)
Highest (Score = 10-15)			3 (2.59)
Depression	00.00-23.00	7.83±4.84	
Yes (Score ≥10)			38 (32.76)
No (Score <10)			78 (67.24)
Anxiety	22.00-80.00	52.27±11.58	
Low (Score = 20-40)			20 (17.24)
Moderate (Score = 41-60)			69 (59.48)
High (Score = 61-70)			20 (17.24)
Highest (Score = 71-80)			7 (6.03)

Table 4. The correlations between the MHL on stress, depression, and anxiety among patients with chronic heart failure in cardiac outpatient department at the Chest Disease Institute of Thailand. (n = 116)

Variables	Stress	Depression	Anxiety	MHL
Stress	1			
Depression	0.388**	1		
Anxiety	0.235*	0.436**	1	
MHL	*-0.306**	*-0.590**	*-0.574**	*1*

Note: *$p<0.05$, **$p<0.001$

Patients with chronic heart failure demonstrated a moderate level of MHL, which may explain why most subjects had a moderate level of knowledge. This may be attributed to the fact that the majority of the sample group comprised moderately dependent elderly individuals who were homebound (87.50%), and late elderly individuals (44.30%) who were unable to carry out activities independently. This population may have difficulty accessing health information and seeking help from others, contributing to their moderate level of MHL. Additionally, as individuals age, they may also experience other impairments such as visual and hearing loss, as well as declines in intelligence and cognitive function, which can make it difficult for them to access and analyze health information related to mental disorders or distress, including understanding the causes of their symptoms. Based on the study by Kim et al. (2017) on MHL in the elderly, age was found to be a predictor of MHL in the

elderly. Additionally, the majority of the participants in this study had no more than a primary education level (72.80%), which may limit their reading ability and ability to understand and analyze data.

Another factor that may be related to MHL is marital status. In this study, approximately 60% of the survey respondents were single, widowed, separated, or divorced, which may have resulted in a lack of support in accessing information about mental health and other forms of support. These results are consistent with the literature review on MHL in the elderly, which revealed that marital status has been found to be a predictor of MHL in elderly people (Kim et al., 2017). That same 2017 study showed a low level of MHL in a sample of elderly people aged 65 years and over. Fisher and Goldney (2003) investigated MHL differences between individuals aged 65-74 and 15-24 years old; those aged 65-74 had lower MHL compared to their younger counterparts.

Of the patients with CHF in the study, 18.97% had moderate stress, 32.76% had depression, 59.48% experienced moderate anxiety, and 17.24% suffered from high anxiety. This is consistent with a study by Rutledge et al. (2006), which found that the prevalence of depression among heart failure patients was as high as 22%. These findings are also consistent with previous research on the psychological impact of chronic illness, which has shown that individuals with chronic conditions often experience high levels of psychological distress, including depression and anxiety. The high prevalence of psychological distress among patients with CHF highlights the need for healthcare professionals to address both the physical and psychological aspects of the disease. Interventions aimed at improving patients' psychological well-being, such as cognitive-behavioral therapy, mindfulness-based interventions, and relaxation techniques, may be helpful in reducing symptoms of depression and anxiety in this population.

Certainly, the relationship between the pathophysiology of a disease, such as a low ejection fraction in heart failure, and mental health involves complex interactions. In the case of heart failure, a reduced ejection fraction means that the heart is less effective at pumping blood throughout the body, including to the brain. This diminished cardiac function can lead to decreased cerebral perfusion, resulting in inadequate delivery of oxygen and nutrients to brain tissue. Furthermore, the psychological impact of living with a chronic illness like heart failure cannot be overlooked. Patients may experience heightened levels of stress, anxiety, and depression due to the physical limitations, lifestyle adjustments, and uncertainty about their health. These mental health challenges can further exacerbate the overall burden of the disease and may contribute to a cycle of worsening symptoms and outcomes (Jiang et al., 2021; Mene-Afejuku et al., 2019).

Therefore, addressing both the physiological aspects of heart failure, such as optimizing cardiac function and improving perfusion, and the psychological and emotional aspects through appropriate support and interventions, is crucial for comprehensive patient care. This integrated approach can help improve both physical and mental health outcomes for individuals living with heart failure. Furthermore, the findings of this study suggest that routine screening for psychological distress should be incorporated into the standard care of patients with CHF.

Early identification and intervention of psychological distress may prevent the development of more severe mental health problems and improve overall quality of life for patients with CHF. It is essential that healthcare professionals recognize the impact of psychological distress on patients with CHF and take steps to address this issue in their care.

The study's findings support the hypothesis that MHL is negatively associated with stress, depression, and anxiety among patients with CHF. The concept of MHL, as proposed by Jorm et al. (1997), emphasizes the importance of knowledge and skills in recognizing, managing, and preventing mental health problems. Patients with higher levels of MHL may be better equipped to recognize early signs of stress, depression, and anxiety and take appropriate steps to manage their symptoms. For instance, patients with greater MHL may be more likely to seek out professional support, engage in self-care activities, and adopt coping strategies that promote mental well-being. Conversely, patients with lower levels of MHL may be less likely to recognize their symptoms and or seek help, potentially exacerbating their condition.

The results of this study suggest that interventions aimed at enhancing MHL may be effective in improving the psychological well-being of patients with CHF. Healthcare professionals can play an important role in promoting MHL by providing education and resources to patients, encouraging patients to seek help when needed, and addressing any misconceptions or stigma surrounding mental health.

Limitations of this study include its cross-sectional design, which limits the ability to establish causality between mental health literacy and the levels of stress, depression, and anxiety among patients with CHF. Additionally, the study relied on self-reported data from questionnaires, which may introduce response bias and inaccuracies. The sample size of 116 patients may not fully represent the broader population of patients with CHF, potentially affecting the generalizability of the findings. This study also did not investigate some important factors that may affect the stress, depression, and anxiety of the sample group, such as reimbursement schemes. Future research should conduct a more comprehensive study, addressing these factors.

4. CONCLUSION

In conclusion, the study found that the average age of participants was 60.86±12.98 years with a majority of male participants. The mean score of MHL was 184.28±23.38, while the mean scores for stress, depression, and anxiety were 3.15±2.32, 7.83±4.84, and 52.27±11.58, respectively. The results also revealed significant negative correlations between MHL and stress, depression, and anxiety. The study suggests that MHL among patients with CHF is generally good, and its promotion may help prevent and reduce the severity of stress, depression, and anxiety in this population. Therefore, the cardiac outpatient department could provide care management plans to promote MHL and address the mental health needs of patients with CHF. Overall, the findings of this study emphasize the importance of MHL in improving mental health outcomes among patients with CHF.

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