Review

The Effectiveness of Non-Pharmacological Therapy on Fatigue Level in Patients with Congestive Heart Failure (CHF)

Gede Krishna Eka Yudha, Ni Putu Kamaryati, I Nengah Adiana, & Kadek Sutini

1Institute of Technology and Health Bali, Denpasar, Indonesia

Article Info

Abstract

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Introduction: The consumption of a large number of drugs over a long period of time makes CHF patients experience anxiety. So, it is faster to cause fatigue due to physical and psychological problems. Without significant treatment efforts, it will cause serious problems for patients for a long time. This study aims to present a literature review related to the effectiveness of non-pharmacological therapies to reduce fatigue in heart failure patients.

Methods: We searched three databases (PubMed, Google Scholar, and ProQuest) from 2018 to 2023 both English and Bahasa, and utilized the PRISMA guideline.

Results: We found that non-pharmacological therapies were used, such as back massage, hypnosis, and virtual reality. Those therapies have relaxing effects and release endorphins to reduce the activity of the sympathetic and parasympathetic systems. If heart disease cases are not treated seriously, they will increase annually. Besides, previous research has examined the effectiveness of back massage but this research only used 2 samples with a case study design. Consequently, in terms of reliability and validity, it is still inadequate.

Conclusion: As a result, the number of researches conducted on interventions focusing on back massage therapy for fatigue in CHF patients is still limited. The findings of this study are expected to be the basis for complementary therapy and can be implemented as an independent and innovative intervention in nursing care.

Keywords: congestive heart failure, fatigue, complementary

*Corresponding Author:
e-mail: kamaryati.stikesbali@gmail.com

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INTRODUCTION

Congestive heart failure is the inability of the heart to pump blood in sufficient quantities due to abnormalities in heart function so that the metabolic needs of the tissues are not met [1]. World Health Organization (WHO) data in 2016 showed that in 2015 as many as 23 million people or around 54% of deaths were caused by cardiovascular disease, namely congestive heart failure (CHF). In Indonesia, the 2018 Riskesdas (basic health research) data shows a heart failure rate of 1.5% [2]. A study shows that the prevalence of deaths from heart disease in developing countries tends to increase exponentially with age, as a person ages it will cause a decrease in heart function, this figure increases to around 20 cases of heart failure per 1000 population at the age of 65 years-69 and 80 cases per 1000 population aged 85 years and over. One study conducted in Indonesia stated that the cause of heart failure is strongly related to hypertension. Uncontrolled hypertension can cause heart failure because the heart muscle is damaged due to long-term work overload, continuous high blood pressure causes the supply of heart oxygen demand to increase [3]. Early symptoms that generally occur in patients with heart failure are dyspnea (shortness of breath), easy fatigue and fluid retention [4]. Fatigue is reported to be one of the most disturbing symptoms in cardiac patients. Fatigue occurs due to an imbalance between oxygen supply and demand, because the heart cannot maintain the circulatory process, so the energy supply does not meet energy needs, which can affect the patient mentally and physically [5]. The impact of this fatigue can cause a level of discomfort, mental disturbance, sadness or suffering that can affect the patient’s psychology [6]. With annual trends in heart failure rates and high mortality rates, without significant treatment efforts, congestive heart disease will pose a serious problem for the global community. The Indonesian government has launched (integrated coaching) Posbindu-based treatment and non-communicable disease (NCD) surveillance efforts. However, both efforts have not had an optimal impact. Pharmacological treatment can be considered effective when the patient feels comfortable and has no side effects. In addition, pain relievers have many unpleasant side effects. In these patients, morphine can cause respiratory sedation, hypertonia, and nausea. In this case, a non-pharmacologic approach is attractive as a therapy to reduce the effects of anxiety-induced fatigue [7].

Non-pharmacological therapies that can be used to reduce fatigue in patients with congestive heart failure are the application of breathing exercises, back massage, Benson’s relaxation technique, Hypnosis, Virtual Reality, and massage of limbs [8]. This study generally aims to determine the effectiveness of back massage in reducing fatigue scores in CHF patients. It is hoped that this research can be used as input material and provide information about back massage therapy as a non-pharmacological therapy to reduce fatigue scores in CHF patients so that it can increase insight and knowledge in the field of nursing, especially medical surgery.
METHODS

The research design used is a literature study or literature review. The preparation of related questions in the article using the PICOS method is P: congestive heart failure patients (male, female), I: Non-pharmacological therapy, C: Control group with standard therapy or intervention other than therapy used by researchers, O: fatigue level, S: RTC or quasi-experimental. The search was conducted using three databases, namely Pubmed, Google Scholar, and ProQuest. The search for literature sources used inclusion criteria, namely articles in Bahasa or English, interventions regarding non-pharmacological therapies against fatigue, sample populations with congestive heart failure, and articles from 2018-2023. Exclusion criteria are articles not available in full text form and duplicate articles. In the initial stage of searching journals, a total of 1094 articles were obtained in the range of 2018 - 2023. The search for research articles used keywords adjusted to the Medical Subject Heading (MeSH), namely non-pharmacology therapy OR non-pharmacology intervention OR Complementary OR Complementary intervention and fatigue, congestive heart failure OR Congestive heart failure OR CHF. After that, a search is carried out for the relevance of the articles to be compiled. Of these, only about 53 articles were considered relevant. There were 5 articles with complete criteria, 2 articles with moderate quality, and two articles with low quality. Researchers excluded low-quality studies to avoid bias in the validity of the results and recommendations of the review. As a result, the final selection of articles used in this literature review included fifteen articles. The results of the selection of research articles can be depicted in the attached prism diagram.

RESULTS

A total of fifteen studies were selected for inclusion in the final analysis. One randomized control trial article, one pre-experimental article, and one cross-sectional article, and four case study articles.
Research was identified through databases:
Pubmed (n= 311,614)
Google Scholar, (n= 32)
Pro Quest (n= 114,459)

Total articles (n=426,105)

Duplicate issued (n= 246)

Total articles after screening (n= 425,859)

Issued (n= 425,841)
Does not meet the inclusion and exclusion criteria, such as population, year of publication, intervention and outcome.

Full text fit file for purpose (n= 18)

Issued (n= 18)
Assessment of the quality of the article on the main question is the focus of the review

Studies included in the final screening (n=15)

Fig. 1. Flow diagram based on PRISMA
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<tr>
<th>Author and Year</th>
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<tr>
<td>Floriane Rousseaux, Marie Elisabeth Faymonville, Anne Sophie Nyssen, Nadia Dardenne, Didier Ledoux, Paul B. Massion, Audrey Vanhauden huyse (2020).</td>
<td>a. <strong>Research design</strong> <em>A randomized control trial</em> &lt;br&gt;b. <strong>Time</strong> Year 2019 &lt;br&gt;c. <strong>Sample</strong> 100 adult respondents under the supervision of a cardiologist. &lt;br&gt;d. <strong>Data collection method</strong> Pre and post test with control group approach &lt;br&gt;e. <strong>Instruments used</strong> Observation sheet, hypnosis and VR SOPs.</td>
<td>The aim of this study was to evaluate the feasibility of hypnosis and VR in improving comfort including anxiety, pain, and fatigue in patients undergoing cardiac procedures. This technique alleviates clinical symptoms especially anxiety and pain.</td>
<td>The research findings show that hypnosis and VR have been shown to be effective in reducing pain perception and anxiety.</td>
</tr>
<tr>
<td>Sezgin Dilek &amp; Mert Hatice (2021). [7].</td>
<td>a. <strong>Research design</strong> <em>Descriptive research and cross-sectional study</em> &lt;br&gt;b. <strong>Time</strong> Year 2020 &lt;br&gt;c. <strong>Sample</strong> 104 patients with a diagnosis of heart failure &lt;br&gt;d. <strong>Data collection method</strong> Filling out the questionnaire &lt;br&gt;e. <strong>Instruments used</strong> Observation sheet, CD, Blood Pressure Meter (telemetry)</td>
<td>The use of therapeutic or complementary herbal medicine among patients with heart failure is expected to prevent side effects of medical treatment and improve health by taking vitamins and complementary medicines.</td>
<td>The findings showed that no significant association could be detected between sociodemographic and disease-related patient characteristics and complementary and alternative medicine use.</td>
</tr>
<tr>
<td>Tri Endah Pangastuti Sudrajat, Febriana Mangngi, Y.Kalvein. M. (2021). [9]</td>
<td>a. <strong>Research design</strong> <em>Pre-post test design</em> &lt;br&gt;b. <strong>Time</strong> Year 2020 &lt;br&gt;c. <strong>Sample</strong> 30 intervention group, 30 control group &lt;br&gt;d. <strong>Data collection method</strong> Pre and post test with control group approach &lt;br&gt;e. <strong>Instruments used</strong> observation sheet, Benson’s relaxation SOP, FSS questionnaire</td>
<td>The results showed that after Benson's relaxation can affect the decrease in fatigue levels in heart failure patients with a p value (0.000) and in the control group there was no change in p value (0.073).</td>
<td>Benson relaxation therapy is effectively used to reduce fatigue and anxiety levels in patients with heart failure. This study did not include factors that affect the effectiveness of Benson's relaxation.</td>
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<tr>
<td>Siti Zahrotin (2019) [10]</td>
<td>a. <strong>Research design</strong> <em>Case study</em> &lt;br&gt;b. <strong>Time</strong> Year 2019 &lt;br&gt;c. <strong>Sample</strong></td>
<td>The results showed a change in the patient’s vital signs before and after the intervention was</td>
<td>The results showed a change in the patient’s vital signs before and after the intervention was</td>
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</table>
Case study  
b. **Time**  
Year 2021  
c. **Sample**  
2 sample patients with heart failure  
d. **Data collection method**  
Observation and interview  
e. **Instruments used**  
Observation sheet, and SOP for back massage | The application results showed that after being given the intervention both samples experienced a decrease in fatigue from a score of 20 to 38 with a p value (0.00; <0.05). | Based on these findings, the decrease in fatigue levels in this study was caused by back massage therapy which can help improve fatigue scores with heart failure because the benefits of back massage can stimulate parasympathetic receptors. |
Case study  
b. **Time**  
Year 2022  
c. **Sample**  
2 patients in the Heart Disease Room of Jend. Ahmad Yani Metro Hospital.  
d. **Data collection method**  
Observation and interview  
e. **Instruments used**  
Observation sheet, back massage SOP, FACIT fatigue scale | The results showed that after doing breathing exercise, the fatigue level of coronary heart patients experienced a change where previously it had a moderate category to a mild category with a P value = 0.000 (<0.05). | Many factors influence the outcome of reducing fatigue levels in cardiac patients, be it psychological, environmental and physical problems including ineffective breathing patterns. |
Pre experimental, One group pre-post test design.  
b. **Time**  
November, 2019  
c. **Sample**  
20 Respondents  
d. **Data collection method**  
Pre and post test with 1 intervention group  
e. **Instruments used**  
Observation sheet | The results showed that before the limb massage was obtained a value of 0.370 after the limb massage was obtained a significant value of 0.558. The results of p value (0.000) <α (0.05) so that it appears that there is a decrease in fatigue due to leg massage in heart failure patients. | Age and gender factors are considered influential in reducing fatigue levels in cardiac patients. The results of this study are expected to be the basis for complementary therapy and can be implemented as an independent and innovative intervention in nursing care in CHF patients. |
| Astuti (2020) | a. **Research design**  
Case study | In this study used as many as eight articles | The results of this study can be used as |
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<td></td>
<td>December 2020</td>
<td>that have been analyzed and obtained as many as two articles that discuss about nursing interventions giving semi fowler positions, two articles discussing the action of nursing, namely Slow Deep Breathing, one article discussing the administration of 30-degree foot position, one article that discusses the provision of deep breath relaxation techniques, and two articles discussing cardiac rehabilitation or physical exercise.</td>
<td>input for the installation of health services is expected to improve the performance of nurses and medical personnel so as to improve nursing care for patients, especially patients with Congestive Heart Failure (CHF).</td>
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|                 | c. **Sample**
|                 | 8 articles                                                   |                                                                          |                     |
|                 | d. **Data collection method**
|                 | Database which used in the form of Proquest and Google Bachelor with using the keyword action intervention or action intervention or nursing intervention and CHF or congestive heart failure or congestive heart failure and decreased cardiac output or decreased cardiac output. |                                                                          |                     |
|                 | e. **Instruments used**
|                 | Found article based on predetermined keywords then synthesized and analyzed according to inclusion and exclusion criteria. The inclusion criteria used included the population of CHF patients who experienced decreased cardiac output, the outcome of nursing interventions for CHF patients who experienced decreased cardiac output and the study design in the form of study descriptive and case studies. |                                                                          |                     |
|                     | Case study                                                  |                                                                          |                     |
|                     | b. **Time**
|                     | 3 days of intervention                                       |                                                                          |                     |
|                     | c. **Sample**
|                     | 60 respondents                                               |                                                                          |                     |
|                     | d. **Data collection method**
|                     | Pre and post intervention in control group and intervention group |                                                                          |                     |
|                     | e. **Instruments used**
|                     | Fatigue severity scale (FSS) questionnaire containing 9 questions/statements |                                                                          |                     |
| Joko Tri Wahyudi & Romiko (2023) [12] | a. **Research design**
|                     | Pre Experimental                                             |                                                                          |                     |
|                     | b. **Time**
|                     | 2022                                                        |                                                                          |                     |
|                     | c. **Sample**
|                     | 22 sample                                                   |                                                                          |                     |

The results of this application illustrate that after Benson relaxation can affect the decrease in the level of fatigue in heart failure patients with a p value (p value 0.000) and in the control group there is no change with a p value (p value = 0.073) With these results it can be concluded that the benson relaxation intervention has an effect on reducing the level of fatigue in heart patients.

Based on the results of the dependent t test analysis, a p value of 0.000 was obtained (p value <0.05), thus it can be interpreted SEFT therapy can have an effect on reducing fatigue in patients with cardiovascular disease.
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<td><strong>d. Data collection method</strong>&lt;br&gt;Pre and post intervention</td>
<td>that there is a difference in the fatigue score of patients with cardiovascular disease between before and after the SEFT therapy intervention.</td>
<td>To intervene related to hot ginger foot therapy in reducing Fatigue Scale in heart failure patients.</td>
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<td><strong>e. Instruments used</strong>&lt;br&gt;In collecting data, researchers used a questionnaire with using the functional fatigue assessment for chronic illness therapy (FACIT) scale.</td>
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<td><strong>b. Time</strong>&lt;br&gt;2022</td>
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<td></td>
<td><strong>c. Sample</strong>&lt;br&gt;76 respondents with heart failure in the working area of Jalan Gedang Bengkulu Health Center with a target of 15 samples</td>
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<td><strong>d. Data collection method</strong>&lt;br&gt;Pretest and posttest and without a controlled design.</td>
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<td></td>
<td><strong>e. Instruments used</strong>&lt;br&gt;Questionnaire of fatigue scale</td>
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<td>Rissa Latifardani &amp; Dian Hudiyawati (2023) [14]</td>
<td><strong>a. Research design</strong>&lt;br&gt;correlative descriptive</td>
<td>Based on the results of the study, the majority of fatigue levels are in the severe fatigue category. While the quality of life is mostly in the bad category. Patients with severe fatigue tend to have a poor quality of life.</td>
<td>There is a relationship between fatigue and quality of life in heart failure patients RSUD Dr. Moewardi Surakarta.</td>
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<td><strong>b. Time</strong>&lt;br&gt;December 2022 to January 2023</td>
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<td><strong>c. Sample</strong>&lt;br&gt;Respondents were 106 in heart failure patients</td>
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<td><strong>d. Data collection method</strong>&lt;br&gt;Share the questionnaire</td>
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<td><strong>e. Instruments used</strong>&lt;br&gt;Fatigue Assessment Scale (FAS) and questionnaire World Health Organization Quality Of Life-BREF (WHOQOL-BREF).</td>
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<td>Toar Calvin Christo Paat, Kadek Ayu Erika, Ariyanti Saleh (2020) [15]</td>
<td><strong>a. Research design</strong>&lt;br&gt;A systematic review using the Preferred reporting items for systematic review and meta-analysis (PRISMA)</td>
<td>Six articles were identified and determined to conduct this systematic review. All studies were conducted using intervention trials of complementary therapy to increase quality of life. Those therapy included Music therapy, a</td>
<td>It is concluded that complementary therapy showed strong evidence to improve the quality of life in heart failure patients. In practice, official standard procedures are needed.</td>
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<td><strong>b. Time</strong>&lt;br&gt;2010 to 2020</td>
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<tr>
<td></td>
<td><strong>c. Sample</strong>&lt;br&gt;Six articles</td>
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<td></td>
<td><strong>d. Data collection method</strong>&lt;br&gt;Determined articles about intervention articles that discuss the effectiveness of</td>
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<td>Fitriani, Maha Sari Carolina, Siti Zahara Nasution (2023) [16]</td>
<td>complementary therapies to improve quality of life in heart failure patients e. <strong>Instruments used</strong> MLHFQ is the most widely used assessment instrument, the rest are EuroQol, KCCQ and WHOQOL. All studies revealed the significance improvement of quality of life.</td>
<td>walking exercise program with regulates breathing patterns, Benson's relaxation, yoga practice, tai chi. These therapy provided by trained nurse.</td>
<td>This study shows significant results that aromatherapy such as lavender, lemon, peppermint, and rose is widely used in chronic diseases, especially cancer, heart disease, DM, osteoarthritis and CRF for complaints of pain, nausea, vomiting, quality of sleep, anxiety and fatigue and pruritus.</td>
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| Nisa Utami, Ero Haryanto, Anisa Fitri (2019) [17] | a. **Research design** Quantitative descriptive b. **Time** 1 day of intervention c. **Sample** 30 respondents d. **Data collection method** Share questionnaires e. **Instruments used** Fatigue Assessment for Chronic Illness Therapy (FACIT) | The results showed that 18 respondents (60%) experienced severe fatigue. | Improve the assessment of fatigue in order to determine appropriate interventions in nursing care |
DISCUSSION

A total of 185 patients were involved in this study. The participants in all studies included both males and females. The mean age of the patients was around 60 years, ranging between 48 and 80 years. The clinical condition of the participants was diagnosed with Congestive Heart Failure (CHF).

Non-Pharmacologic Therapeutic Interventions

All the studies analyzed had varied interventions. The study conducted by [18], Implementing Breathing Exercises in Coronary Heart Disease (CHD) patients to reduce fatigue. This research uses a case study design using two samples. Therapy was carried out for three days and carried out twice a day. The researcher explained that after breathing exercises, the fatigue level of coronary heart patients changed from previously moderate fatigue, and after breathing exercises, the fatigue level was at a low-moderate level. A study conducted by [3] applied massage to the back. This study used a case study design by taking two samples of heart failure patients. Therapy was given for three days to both samples and it was found that the application of back massage can reduce the level of fatigue in heart failure patients. A study conducted by [8] applied limb massage to reduce fatigue in CHF patients. The design used in this study was one group pre-test post-test design. The number of samples used amounted to 20 heart failure patients who experienced fatigue. The results showed that there was a decrease in the level of fatigue due to limb massage.

Another study conducted by [10] used a back massage intervention for patients with heart failure who experienced fatigue. This study used a case study design with one sample of heart failure patients. The intervention was carried out for three days and showed the results that there were significant changes in the level of fatigue before and after the intervention.

Another study conducted by [19] examined the use of complementary medicine combined with pharmacological therapy. The design used was a descriptive design using 104 samples of patients with heart failure after three months of diagnosis. The results of this study indicate that there is an effect that occurs if the patient is on medication and vary in using alternative or complementary medicine.

Another study by [9] states that another non-pharmacological therapy that can be used is Benson’s relaxation therapy. This study used a pre-test post-test experiment design with a sample size of 60 people, namely 30 people as an intervention group and 30 people as a control group. The intervention was given for three days, two times a day, in the morning and evening. The result is that after applying Benson’s relaxation therapy, there is a decrease in fatigue levels. Another research by [7] applied hypnosis and virtual reality as non-pharmacological therapy. This study used a prospective randomized design with a sample size of 100 people. The intervention was given in two sessions, one day before surgery and one day after surgery. The results showed that both interventions were efficient in
reducing fatigue and anxiety in cardiac patients.

**Clinical Outcome**

Thirteen studies (86%) showed significant results that non-pharmacological therapies can effectively reduce fatigue levels in patients with heart failure. Five of the fifteen studies evaluated fatigue levels due to anxiety and side effects as outcomes. Even non-pharmacological therapy in the form of hypnosis can reduce anxiety levels in patients with heart disease. [7]

**Side Effects**

All studies reported no side effects during the procedure, but one study showed that if side effects occur, a rest period is required before repeating the procedure. Therefore, this therapy can be used as an alternative to concurrent pharmacological treatment.

**DISCUSSION**

Based on the results of the review of articles that have been conducted as a whole, it states that non-pharmacological therapies are given to reduce the level of fatigue in patients with congestive heart failure. However, there are several studies that state that non-pharmacological therapy is not effective in reducing fatigue levels in patients with heart failure.

Each study has differences in the non-pharmacological therapies used, this also affects how quickly or slowly the therapy can work. There are several factors that influence the effectiveness of therapy on fatigue levels [20]. Studies mention that the effectiveness of therapy is strongly influenced by the emotional state and physical problems of clients while undergoing this therapy. Physical problems include activity intolerance, inefficient breathing patterns, and others, while psychological problems due to heart failure include anxiety, chronic stress, and depression. The combination of physical and psychological problems leads to fatigue. [18]

Another study also mentioned that medical history affects the level of fatigue in patients with congestive heart failure. The most common comorbid chronic disease suffered by CHF patients is hypertension. The results of the blood pressure examination resulted in the majority of CHF patients having pre-hypertension blood pressure. In someone with hypertension, heart failure is caused by the presence of excess pressure due to the development of left ventricular hypertrophy (LVH), which then causes an increase in left ventricular filling pressure and diastolic heart failure [3]. Most congestive heart failure patients feel tired on a 3-point scale, sometimes tired sometimes not, and on a 4-point scale every day. The study conducted by Sudrajat et al., (2021) showed the results of a study that showed the level of fatigue felt by most respondents is quite tired. The GFI score was 22.9. The moderate level of fatigue experienced by patients causes patients to feel tired during normal physical activity but improves with rest. Fatigue contributes the most to decreased functional performance. Fatigue can be a symptom that is difficult to control, but managing fatigue
should be a priority for heart failure patients due to its debilitating effects. [21]

The effect provided by non-pharmacological therapy provides stimulation that can reduce fatigue, one of the studies conducted a massage that will cause a relaxing effect and can stimulate the release of endorphins to reduce the activity of the sympathetic and parasympathetic systems. The effects that may occur are refreshing and relaxing through peripheral nerve stimulation and can increase peripheral skin circulation through the sympathetic nervous system so as to relax the muscles and can widen vascular circulation, provide a sense of comfort can reduce the level of fatigue in heart failure. [8]

Other studies mention that the use of non-pharmacological therapies such as dietary supplements, vitamins, or herbal medicines does not yet have sufficient data on the safety and effectiveness of the use of these products. Heart failure patients who use complementary or alternative medicine may have adverse effects and unknown consequences. Healthcare professionals should inform patients about complementary and alternative medicine techniques and non-pharmacological therapies that will be used. [19]

The implication of this literature study is that there are special programs, especially non-pharmacological therapies that can be given to patients with congestive heart failure in health care units, especially by professional health workers. The approach taken with safe non-pharmacological therapies can be given together with drug therapy to cardiac patients. These two things are given together and are expected to reduce the level of fatigue, especially due to physical and psychological problems. Nurses as health professionals can provide this non-pharmacological therapy according to what patients need in all care units with heart disease patients, especially congestive heart disease.

CONCLUSION

This systematic review shows that non-pharmacological therapy is an effective therapy in reducing fatigue levels in patients with congestive heart failure according to the psychological state and physical problems experienced by patients. The results of this study are expected to be the basis for complementary therapy and can be implemented as an independent and innovative intervention in nursing care. Further research is needed to examine non-pharmacological therapies that have better effectiveness in reducing fatigue levels in heart failure patients. If heart disease cases are not treated seriously, they will increase from year to year. Apart from that, previous research has examined the effectiveness of back massage, but this research only used 2 samples and had a case study design. So, in terms of reliability and validity, it was not yet adequate. Apart from that, there is still minimal research conducted with interventions focusing on back massage therapy for fatigue in CHF patients. Therefore, in this study, researchers will focus on back massage therapy on the level of fatigue scores in CHF patients. This research used a quasi-experimental design with two groups, namely a treatment group and a control group.
CONFLICT OF INTEREST

The author states that there is no conflict of interest in writing this article.

FUNDING

There is no relevant financial or material interest in the research described in this article.

ETHICAL APPROVAL

Not applicable.

AUTHOR CONTRIBUTIONS

All authors contributed to the review process. Author 1 conducted article search the and literature review. After completing the manuscript, each author reviewed the findings.

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