



THE EFFECT OF *TELEREHABILITATION* TO IMPROVE *QUALITY OF LIFE* IN PATIENT OF *HEART FAILURE (HF)*

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ABSTRAK

Heart failure is one of the biggest causes of death worldwide. The fragility of heart failure patients becomes more vulnerable and at greater risk of physical, functional, cognitive, and emotional decline leading to decreased quality of life. Telerehabilitation provides rehabilitation services at a distance through information technology and telecommunications, such as telephone, internet, and video conferencing conducted at the patient's home as an effective and safe complementary alternative in improving the quality of life. This study aimed to determine the quality of life before and after the implementation of Telerehabilitation. A quasi-experimental study of a single group. A purposive sampling technique was used to collect the data, with a sample of 17 respondents. Data was collected using a Minnesota Living with Heart Failure Questionnaire (MLHFQ) before and after the intervention. The statistical test used was Paired Sample T Test. Heart failure patients will carry out a telerehabilitation program that has been agreed upon by the nurse and doctor. The results of the Paired Sample T Test Quality of Life above show the P value (Sig. 2-tailed) 0.00 or less than 0.005 (<0.05), so it can be concluded that the implementation of Telerehabilitation affects improving the quality of life in Heart Failure patients.

Keywords: heart failure; telerehabilitation; telemonitoring; quality of life

INTRODUCTION

Heart failure (HF) is a complex clinical syndrome characterized by a decreased ability of the heart to pump blood to meet the body's oxygen needs (Smeltzer and Bare, 2010). According to WHO in 2016 estimated that 41 million people worldwide died or equivalent to 71% of all deaths caused by heart disease (17.9 million), cancer (9.0 million), chronic respiratory disease (3.8 million), and diabetes (1.6 million) (WHO, 2020). Heart disease is still the highest contributor to death in the world and this is predicted to continue to increase until 2030 (WHO, 2020, 2021). Meanwhile, the prevalence of heart failure in Indonesia according to Riskesdas data also increased from 25.8% (2013) to 34.1% (2018) (RISKESDAS, 2013, 2018a) and according to the results of the Indonesian Health Profile data at the end of December 2020, it showed that heart disease was the disease with the most cases, namely 11,592,990 cases (MOH, 2021). Cases of heart disease in the province of South Sulawesi alone in 2018 according to Riskesdas there were reported as many as 49,396 cases with the highest level being in the Makassar area with 11,199 cases. (RISKESDAS, 2018b).

RSUP Ibnu Sina Makassar is one of the hospitals in the city of Makassar that has integrated cardiac services. Based on the results of a preliminary study conducted, it was found that in 2021 there were 1,371 visits with heart failure patients at the heart clinic compared to 2016 there were 477 visits. This indicates that there is a significant increase above 100% in patients with heart failure in the last 5 years. The data above shows that fluctuations in heart failure patients continue to increase every year. The increasing prevalence of heart failure patients will cause changes in the physical and psychological aspects of patients.

Physical changes include dyspnea, dizziness, edema, weakness or lack of energy, and sleep disturbances. In addition, psychological changes include stress, anxiety, and depression due to changes in heart function. This makes the quality of life in patients with heart failure decreasing (Alpert et al, 2017). Having a poor quality of life affects not only the physical aspect but also the emotional state of the HF patient. This results in depressive symptoms which can adversely affect the patient's self-care. Without proper self-care, the patient's condition can quickly become fragile and deteriorate regardless of age. The fragility of patients with HF makes them more vulnerable and at greater risk of physical, functional, cognitive and emotional decline (Gonzalez, 2016). One of the right choices in improving the quality of life of heart failure is by telerehabilitation / telemonitoring.

Telerehabilitation is the provision of rehabilitation services at a distance through information technology and telecommunications, such as telephone, internet and video conferencing conducted at the patient's home as an effective and safe complementary alternative in improving the quality of life (Brouwers et al., 2020). According to research conducted by (Madigan et al., 2013; Mizukawa et al., 2019; Ong et al., 2016; Rohde et al., 2021; Seto et al., 2012) it can be concluded that the application of telerehabilitation/telemonitoring is able to improve the quality of life of patients as seen from the significant difference in values before and after the application of the intervention, besides that this application is also able to improve health status, self-care, self-efficacy, clinical management, and education as well as reduce rehospitalization and rates. death in heart failure patients. The purpose of this study was to assess the effect of telerehabilitation on improving quality of life

METHOD

The research design used in this study was a quasi-experimental pre and post one group design. The population in this study were all heart failure patients at the Cardiology Clinic of RS Ibnu Sina, Makassar. The sample size are 17 people using purposive sampling technique, with the following criteria:

1. Inclusion criteria

- a) HF diagnosis (primary or secondary), NYHA (New York Heart Association) class II-IV (Madigan et al., 2013; Seto et al., 2012)
- b) Decompensated heart failure/ADHF (defined as heart failure with initiation) (Ong et al., 2016)
- c) Able to access phone or smartphone (Madigan et al., 2013; Mizukawa et al., 2019; Ong et al., 2016; Rohde et al., 2021; Seto et al., 2012)

2. Exclusion criteria

- a) Patient on heart transplant waiting list (Rohde et al., 2021)
- b) Patients on waiting list Surgical or percutaneous (coronary or valvular) intervention (Rohde et al., 2021)
- c) Inability to understand or interact with SMS/phone/smartphone text messages due to cognitive disability or social problems (Ong et al., 2016; Rohde et al., 2021; Seto et al., 2012)
- d) Severe comorbidities that have treatment priorities (Madigan et al., 2013; Mizukawa et al., 2019)

The procedure starts when the heart failure patient enters the Cardiology Poly room and the researcher explains the benefits that will be obtained during the telerehabilitation implementation program. After that, the doctor explained the rules for taking medication, a brief explanation about heart failure and self care that must be done at home for approximately 10-15 minutes. After that, the patient gave informed consent and filled out the Minnesota Living

with Heart Failure Questionnaire (MLHFQ) in the Heart Poly waiting room. Researchers distributed 2 leaflets related to heart failure information and heart failure self care and made a time contract in the implementation of the telerehabilitation / telemonitoring program 2 days after the patient returned home from hospital control. Patients will be sent SMS (Short Message Service) twice a day, at 07.00 WITA and 16.00 WITA. The first day in the morning at 07.00 WITA the patient will be reminded of the schedule for taking medicine and doing self care, and in the afternoon at 16.00 WITA by confirming the medicine that has been taken, self-care that has been carried out, information about heart failure that you want to ask, and reminding again to medication schedule. The second day in the morning at 07.00 WITA, the patient will be confirmed again regarding the drugs that have been taken yesterday, information about heart failure that you want to ask, being reminded again about the schedule for taking medicine and doing self care today, and in the afternoon at 16.00 WITA by confirming the medicine that has been taken. taken, self care that has been done, information about heart failure that you want to ask, and reminding you to take medication. This procedure is performed every day for one month or until the control patient returns to the hospital. Ibn Sina Makassar. Evaluation was carried out upon arrival of the next control by filling out the Minnesota Living with Heart Failure Questionnaire (MLHFQ) in the waiting room of the Cardiology Clinic.

Table 1.
Telerehabilitation / Telemonitoring Implementation Program (Madigan et al., 2013; Mizukawa et al., 2019; Ong et al., 2016; Rohde et al., 2021; Seto et al., 2012)

| Telerehabilitation | Clock | |
|---------------------------------------|---|--|
| | 07.00 | 16.00 |
| Day 1 | <ol style="list-style-type: none"> 1) Remind the schedule for taking medication 2) Remind to do Self care (according to the leaflet provided) | <ol style="list-style-type: none"> 1) Confirm the medication taken this morning (type & time) 2) <i>self care</i> which is conducted 3) Heart failure information you want to ask 4) Remind the schedule for taking medication |
| Day 2 | <ol style="list-style-type: none"> 1) Confirm the drugs taken yesterday (type & time) 2) Heart failure information you want to ask 3) Remind the schedule for taking medication 4) Remind to do self care | <ol style="list-style-type: none"> 1) Confirm the medication taken this morning (type & time) 2) <i>self care</i> which is conducted 3) Heart failure information you want to ask 4) Remind the schedule for taking medication |
| Day 3 | <ol style="list-style-type: none"> 1) Confirm the drugs taken yesterday (type & time) 2) Heart failure information you want to ask | <ol style="list-style-type: none"> 1) Confirm the medication taken this morning (type & time) 2) <i>self care</i> which is conducted 3) Heart failure information you want to ask |
| ↓ | | |
| Day 30 | <ol style="list-style-type: none"> 3) Remind the schedule for taking medication 4) Remind to do self care | <ol style="list-style-type: none"> 3) Heart failure information you want to ask 4) Remind the schedule for taking medication |
| Done up to 30 days or further control | | |

RESULT

Table 2.
Frequency Distribution of Respondents' Characteristics (n=17)

| Characteristics | f | % |
|--------------------------|----|------|
| Age | | |
| Middle Ages(45-59 Years) | 10 | 58.8 |
| Elderly(60-74 Years) | 7 | 41.2 |
| Education | | |
| SD | 8 | 47.1 |
| Junior High School | 3 | 17.6 |
| Senior High School | 3 | 17.6 |
| Bachelor | 3 | 17.6 |

Characteristics of respondents based on table 2, it is known that most of the respondents fall into the Middle Age category, aged between 45-59 years as many as 10 respondents (58.8%). Most of the respondents' last education was elementary school as many as 8 respondents (47.1%).

Table 3.
Quality of life of respondents (n=17)

| | mean | f | Std. Deviation | Std. Error Mean |
|---------------|-------|----|----------------|-----------------|
| Pair 1 Before | 45.59 | 17 | 5.896 | 1,430 |
| After | 93.76 | 17 | 3.437 | .834 |

Based on the results of the analysis of the quality of life of the respondents, it is known that the quality of life of the patients before the implementation (pretest) of telerehabilitation is 45.59% and the results of the analysis of the quality of life of the respondents, it is known that the quality of life of the patients after the application (posttest) of telerehabilitation is 93.76%.

Table 4.
Paired t-test Quality of life respondents (n=17)

| | <i>Paired Differences</i> | | | | t | df | Sig. (2-tailed) | |
|-----------------------|---------------------------|----------------|-----------------|---|---------|---------|-----------------|-------|
| | mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | | | | Upper |
| Pair 1 Before - After | -48.176 | 4,545 | 1,102 | -50,513 | -45.840 | -43.707 | 16 | .000 |

The result of the Paired Sample T Test is determined by its significance value (Sig. 2-tailed). If the significance value is <0.05, it indicates a significant difference between the initial variable and the final variable or a significant effect on the difference in treatment given to each variable and if the significance value is >0.05, it indicates that there is no significant difference between the initial variable and the final variable. or there is no significant effect on the difference in the treatment given to each variable. Based on the results of the Paired Sample T Test Quality of Life above, the results of the P value (Sig. 2-tailed) are 0.001 or less than 0.05 (<0.05), so it can be concluded that the implementation of Telerehabilitation has an effect on improving the quality of life in Heart Failure patients.

DISCUSSION

Implementation of Telerehabilitation in improving Quality of Life in Heart Failure patients

Quality of life according to the World Health Organization Quality of Life (WHOQoL) group, is defined as an individual's perception of the individual's position in life in the context of the culture and value system in which the individual lives and its relationship to the goals, expectations, standards set and one's concerns. It is a concept of levels, summarized in a complex manner including physical health, psychological status, level of independence, social relationships, personal beliefs and relationships to the characteristics of their environment (WHOQOL, 2012). The changes that heart failure patients will experience are physical and psychological changes. Physical changes include dyspnea, dizziness, edema, weakness or lack of energy, and sleep disturbances. In addition, psychological changes include stress, anxiety, and depression due to changes in heart function. This makes the quality of life in patients with heart failure decreasing (Alpert et al, 2017). Having a poor quality of life affects not only the physical aspect but also the emotional state of the HF patient. This results in depressive symptoms which can adversely affect the patient's self-care. Without proper self-care, the patient's condition can quickly become fragile and deteriorate regardless of age. The fragility of patients with HF makes them more vulnerable and at greater risk of physical, functional, cognitive and emotional decline (Gonzalez, 2016).

Age is one of the important factors in carrying out treatment actions. A person's age also affects the perception and mindset. The older you get, the more your grasping power and mindset will develop, so that the knowledge you get is getting better (Erdian, 2009). In addition to age, the level of education also affects the process of self-care. According to Santrock, J. (2014), states that the higher a person's level of education, the easier it is to receive information so that they have more experience and will have an impact on their cognitive. Education is one of the important factors in everyday life. The level of education will affect a person's perception of cognitive. Therefore, telerehabilitation is an alternative in the self-care process to improve the quality of life of heart failure patients.

Telerehabilitation is the provision of rehabilitation services at a distance through information technology and telecommunications, such as telephone, internet and video conferencing conducted at the patient's home as an effective and safe complementary alternative in improving the quality of life (Brouwers et al., 2020). This telerehabilitation can help improve accessibility for people with heart failure starting from supervised regular physical exercise, educational programs related to conditions experienced, increasing exercise compliance and lifestyle modification, increasing medication adherence, cost savings and reduced utilization of health facility services, as well as weekly feedback regarding the condition of the patient's status (Cavalheiro et al., 2021).

Based on the results of the analysis of the quality of life of the respondents at the time of the pretest and posttest, it showed that there was an increase in the quality of life that occurred in the respondents after the implementation of telerehabilitation. The results of this study are in line with research conducted by (Ong et al., 2016) which states that there is an improvement in the quality of life of heart failure patients after telemonitoring/telerehabilitation. The mean quality of life score for 30 days was 31.23 and increased at the time of measurement at 180 days with an average of 30.49, so there was a significant difference in the quality of life scores of heart failure patients between the intervention group (mean=28.50) and the control group (mean=28.50). =32.63) unadjusted ($P = .02$) and adjusted ($P = .02$) analysis. Mizukawa et al., also stated that collaborative management also showed a significant difference in QOL (quality

of life) scores compared to usual care and self-management ($P=0.029$ at 18 months and $P=0.039$ at 24 months). QOL scores increased when collaborative management was combined with usual care (telerehabilitation) at 18 and 24 months ($P=0$) (Mizukawa et al., 2019). Similar studies were also conducted by Madigan et al., Rohde et al., and Seto et al., who stated that telerehabilitation/telemonitoring can improve quality of life in patients with heart failure (treatment effect=10.6, $P=0.05$, $P=0.02$) (Madigan et al., 2013; Rohde et al., 2021; Seto et al., 2012).

CONCLUSION

Telerehabilitation or mobile-based telemonitoring provides evidence in improving quality of life, clinical management, psychosocial status and preventing re-hospitalization. The use of a mobile-based system has a high level of compliance and is feasible for patients because mobile phones have become a primary need for the community so that this program can be used as an important additional program for health services for patients with heart failure in improving health status. With a simple and intensive education and self-care promotion strategy, this telerehabilitation program has proven to be effective and can be applied to a wider population around the world.

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