# Outcomes of Self-Care in Clients with Heart Failure before and after Treatment, using a Case Management Approach

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## ABSTRACT

*Purpose: Heart failure (HF) is a clinical syndrome that is the final stage of most types of heart diseases. Thailand - in the Asia-Pacific region - has an unusually high incidence as the risk factors for heart disease increase due to population structure changes. This article aims to compare the self-care of heart failure clients before and after treatment using case management.*

*Methods: A quasi-experimental research design was employed with 30 clients who were treated at the Khon Kaen University Heart Failure Clinic (KKU-HF) between April 2017 and March 2018. The research tool was a 2-part questionnaire that included demographic data and the comparison of scores of self-care before and after treatment using case management. Inferential statistics and paired t-test were used to analyze the data.*

*Results: Most of the clients were males (80%), and most of them (56.67 %) were around 60 years of age and older. A comparison of scores for knowledge and understanding of self-care, before and after the treatment, showed a statistically significant improvement at the level of 0.05. Self-care behavior had also improved. The general quality of life had improved by up to 66.67%.*

*Conclusion and Implications: The goal of this research study was to reduce the rate of re-hospitalization, the cost of medical treatment, and the death rate of heart failure clients. The findings can be used not only to develop self-care systems of the Khon Kaen University Heart Failure Clinic (KKU-HF) but also for other clinics to adopt.*

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## INTRODUCTION

Heart failure (HF) is a clinical syndrome that is the final stage of most types of heart diseases. There are 170 million heart failure clients worldwide and the figure is expected to increase to 200 million in the next 10 years. In 2012, for example, the United States had an average of more than 650,000 HF clients, 65 years of age and older (Masresha, 2014), while in 2014, there was an average of 360,000 clients in Germany (Hendricks et al, 2014). Thailand – based in the Asia-Pacific region, has an unusually high incidence as the risk factors for heart disease increase as the population structure changes (Kanjanawanich and Pornhaminthikul, 2017). It is reported that clients with HF have a high mortality rate of 10 % per year, on average. They have a reduced quality of life and Thailand is spending 150,000 baht per person per annum on care for those having heart failure, and being admitted in hospital with an average period of 10-20 nights per visit (Maharaj Nakorn Chiang Mai Hospital, 2016). The data also shows that more than half of the heart failure clients return to hospital within 3 - 6 months, and that the number of cases increased by 25 % - 54 % compared to the previous year (Therdsuthironnaphum, 2015). The number of people with cardiovascular diseases including heart failure in Thailand, increased from 887.20 in 2013 to 1,011.70 in 2015 (Apiromrat, 2017). In addition, the 2016 data found that in the mortality rate per 100,000 people, there were 32.3 deaths from heart disease and 48.7 deaths from vascular disease (Ariyachaipanich et al, 2019).

Chronic heart failure in Thailand is classified as a cardiovascular disease. There are as many as 3 conditions in this group of diseases (Medical Information Unit, 2017). In 2009, there were 142,843 persons with chronic heart failure, accounting for 46.55% of those diagnosed with cardiovascular diseases. The central region has the highest number of such clients, followed by the northeastern region, north region, and southern region, respectively (Chuekich and Srida, 2013). The Heart Failure Clinic of the Sirikit Heart Centre, connected to the Faculty of Medicine Khon Kaen University (KKU-HF), is one of the hospitals in the northeast region that has the largest number of clients with chronic heart failure. The statistics for clients diagnosed with chronic heart failure over the period of 2013 to 2015, were 1,146 cases (in 2013), 1,497 cases (ln 2014), and 1,297 cases (in 2015), respectively (Medical Information Unit, 2017). These individuals were at high risk of developing chronic heart failure due to their constant use of salt in foods such as

fish sauce and fermented fish. Symptoms exhibited by clients included signs of racing sensation in the chest, inability to lie down, getting tired while sleeping, fatigue, palpitations, swelling, and rapid weight gain (Chuekich and Srida, 2013). Besides, the clients were also affected psychologically and emotionally. Having to deal with stress or fear had caused breathing difficulty, and diuretics resulted in frequent bathroom visits. Feeling confined or excluded and isolated could have resulted in anxiety and depression, leading to their taking medication incorrectly or intermittently. The inability to take responsibility for themselves and be in control makes them feel uncertain, powerless, and unsafe (Tupairoa et al, 2009).

Clients should take care of themselves in order to reduce depression and to improve their quality of life after treatment. Previous studies have shown that the ratio of clients who receive care as per the hospital's requirements will have a reduced return or return to hospital (Hendricks et al, 2014). Clients who gain knowledge and understanding about self-care have better health care behavior than those who do not receive care according to the hospital's requirements (Moshki et al, 2016). For better understanding of health conditions, it is essential to convey information individually. Behaviors motivated by the patient's daily routine tools were: doing physical activities, exercising regularly, measuring one's own pulse, self-observation of abnormal symptoms, appointment with the doctor, compliance with doctor's recommendations while being treated, taking precautions while travelling, treatment of pacemaker infection, and managing self-stress properly (Pensri, 2017). Also, proper treatment of the disease by eliminating the most likely causes of heart failure or risk factors for heart failure, results in improved performance of the heart and/or prevents severe heart failure (Buttaro et al, 2013). Prevention and care of this disease is necessary; therefore, health personnel should learn how to manage clients appropriately and instruct their relatives accordingly, so that they have a better understanding of the kind of care required.

The concept of case management is one way to provide integrated and continuous health services. It focuses on patient-centered care, based on the coordination among various health services, to achieve treatment goals with efficient use of resources (Ross et al, 2011). The KKU-HF is a hospital that applies the aforementioned concept, for instance, nurses do a screening for heart failure before patients receive treatment at the Outpatient Nursing Registration Office.

1) Nurses evaluate health status by recording the client's history, making a physical examination, checking vital signs, conducting chest X-ray

examination, electrocardiogram, and blood collection; assess physical fitness with a 6 MWT walk (six-minute walk test); assess swelling and weight gain, and ask about symptoms of overweight conditions, such as tiredness, sleep, head elevation, inability to lie down, and activities that clients are able to do at home; perform three blood pressure measurements, including posture, sitting and standing, determine orthostatic hypotension, pulse, and oxygen saturation; assess knowledge and understanding of client care issues in matters such as medication, observing abnormal symptoms, and preliminary remedies dealing with swelling and tiredness; assess self-care behavior appropriately and evaluate drug collaboration with pharmacists, emphasizing that clients should bring the drugs they use, each time they visit.

2) Nurses make a nursing diagnosis and increase the accuracy of information on health problems of the clients.

3) Nurses teach their clients to take care of themselves. Teaching is based on the real experiences of the client; reflection of lessons learned takes place in order to ensure that clients better remember the necessary information. Moreover, nurses provide - on a case-by-case basis - knowledge and understanding on topics which the client does not understand and give them a self-care guide. After that, the client is referred to a doctor in order to get a medical diagnosis. Finally, the client will receive a prescription for drugs and can go home.

4) The final step is the continuous monitoring of the well-being of the client. Nurses do so by telephonic inquiry about the client's self-care behavior. In addition, it also provides an opportunity for the client to consult the nurse about other health problems.

With regard to this group of clients, the KKU-HF has a policy of quality development, to provide medical treatment on par with international standards and to be a top center for heart services. Therefore, it has supported the development of client care systems in all departments, both nursing and outpatient services. Accordingly, the nursing department has collaborated with a multidisciplinary team to develop a method for the management of clients with chronic heart failure. They then apply the case management model to establish client care systems in the KKU-HF. However, the guidelines used are still not as clear as they should be, in order to develop the quality of care that would help clients to remain as active as possible.

**Objective**

This research aimed to make a comparison of the outcomes of self-care before and after the treatment of heart failure clients using a case management approach.

# METHOD

### Study Design

This is a descriptive study of quantitative data for the period between April 2017 and March 2018. The case management model has been used for clients with heart failure who received treatment and follow-up at the KKU-HF. The study examined the outcomes of care on the knowledge and self-care behavior of clients.

### Study Population

The study sample consisted of 30 people, 15 years of age and above, who had a doctor's diagnosis of cardiac and vascular heart failure. They were undergoing treatment and follow-up in the hospital's heart failure clinic. Outpatients are seen every Wednesday of the week, and approximately 2-3 clients are admitted at the hospital every week. There are also some clients who return to the hospital within 2-3 months.

The selection criteria were as follows:

1) Clients who were 15 years of age and older, who were able to communicate and had volunteered to participate;

2) Clients diagnosed with heart failure by cardiovascular specialists;

3) Clients having echocardiogram results with ejection fraction (EF) less than or equal to 40% (Pelico, 2013); and,

4) Clients recommended by doctors or nurses for a case management approach because of the risk of repeated hospitalization.

The researcher and research assistants explained the purpose of the study to the clients and their relatives and obtained their written consent before data collection.

## Procedure

This was quasi-experimental research to study a single group over time. Data were collected the first time from the enrolled client prior to admission. Data were collected the second time from the same client after the first treatment, approximately three months later. Between the first and second time, the researcher made a follow-up call with the client at least once, to check on their knowledge and understanding of self-care and self-care behavior and to stress the importance of the next appointment with the doctor.

## Tools

The tool used in this research was a questionnaire consisting of 2 parts. The first has details about the general characteristics of the client. The second part is the assessment of the client's self-care approach. The questionnaire was examined for the validity of the content and reliability by 5 qualified persons with experience in heart failure. As a result, it has a content validity index of 0.88 and confidence with the Cronbach's alpha coefficient of 0.70 (Maharaj Nakorn Chiang Mai Hospital, 2016).

## Data Analysis

After every set of queries in the data collection process had been verified to ensure accuracy and completeness, inferential statistics were used, such as frequency, percentage, mean, and standard deviation. Statistical software packages were used for data processing.

## Ethical Considerations

This research article has been approved by the Khon Kaen University Ethics Committee in Human Research, ethical number HE611353.

# RESULTS

## Demographic Data

The majority of the 30 heart failure clients in the study sample were male (80%) and 20% were female. As many as 56.67% of them were 60 years of age and older, and 73.33% were using gold patents (special welfare benefit from the government) to receive treatment. Most of the clients were married (73.33%) and around

56.67% had their husbands or wives as caregivers while undergoing treatment. The majority (66.67%) had received primary school education and most of them were farmers (53.34%). Coronary heart disease was the cause of heart failure for 63.33% of the clients in the sample, while cardiovascular diseases accounted for 36.67% of them. The data is shown in Table 1.

**Table 1: Personal data of clients (N = 30)**

| General information | Pop | Percent |
|---|---|---|
| **Sex** | | |
| Male | 24 | 80.00 |
| Female | 6 | 20.00 |
| **Age** | | |
| Not over 60 years | 13 | 43.33 |
| More than 60 years | 17 | 56.67 |
| **Treatment rights** | | |
| Individual welfare (gold cards) | 22 | 73.33 |
| Government welfare | 8 | 26.67 |
| **Caregiver** | | |
| Husband or wife | 17 | 56.67 |
| Children/grandchildren or relatives | 12 | 40.00 |
| None | 1 | 3.33 |
| **Marital status** | | |
| Married | 22 | 73.33 |
| Single | 5 | 16.67 |
| Widowed/ divorced | 3 | 10.00 |
| **Education level** | | |
| Primary school | 20 | 66.67 |
| Secondary up | 7 | 23.33 |
| Bachelor's Degree or higher | 3 | 10.00 |
| **Occupation** | | |
| Farmer | 16 | 53.34 |
| Business / Government employees | 7 | 23.33 |
| Housewife / Not a career | 7 | 23.33 |
| **Causes of heart failure** | | |
| Coronary artery disease | 19 | 63.33 |
| Other cardiovascular diseases | 11 | 36.67 |

**Clients' Knowledge and Understanding of Self-care**

Comparison of the clients' knowledge and understanding before and after treatment showed that, in almost all aspects, clients had better knowledge after treatment, with statistical significance at the level of 0.05. Knowledge had improved with regard to reasons for heart failure, limiting of salt in food and controlling the amount of water intake, taking medication according to the doctor's treatment plan, and monitoring and managing symptoms of excess sodium and water. On the other hand, at the 0.05 level, there was no significant difference in their perception of regular exercise before and after treatment. The data is shown in Table 2.

**Table 2: Comparison of self-care knowledge and understanding before and after treatment (N = 30)**

| Knowledge and understanding | Mean | SD | Paired t-test | Sig. |
|---|---|---|---|---|
| Heart failure before being treated | 1.83 | 0.38 | 2.112 | 0.043* |
| Heart failure after being treated | 1.97 | 0.18 | | |
| Limiting sodium salts and controlling drinking water before treatment | 6.83 | 1.21 | 3.034 | 0.005* |
| Limiting sodium salts and controlling drinking water after treatment | 7.53 | 0.63 | | |
| Planning for medication adherence before admission | 4.47 | 0.94 | 2.719 | 0.011* |
| Taking the medication according to the doctor's treatment plan after treatment | 5.00 | 0.98 | | |
| Exercise regularly before being admitted. | 1.77 | 0.43 | 1.140 | 0.264 |
| Exercise periodically after being admitted. | 1.87 | 0.35 | | |
| Surveillance and management of symptoms of sodium and excess water before treatment | 7.83 | 1.29 | 5.761 | 0.000* |
| Monitoring and control of signs of sodium and excess water after treatment | 9.13 | 1.01 | | |

*\* Statistical significance at the level of 0.05*

**Clients' Self-care Behavior**

After receiving treatment, the changes among clients were as follows:

In terms of regularity and attention to medication, herbal medicine, bolus dose or dietary supplements, 73.33% had the highest level of self-care behavior of 3.70 points.

In following the doctor's treatment plan, 70% had a level of self-care behavior of 3.67 points.

On the other hand, the most neglected aspects of self-care was the limited sodium and water intake. Only 13.33 percent of the sample had a self-care behavior score of 2.85 points. The data is shown in Table 3.

**Table 3: Score comparison of self-care behavior before and after treatment (N = 30)**

| Self-care behavior | Mean | SD | Paired t-test | Sig. |
|---|---|---|---|---|
| Sodium restriction in food and control of drinking water before treatment | 2.85 | 0.58 | 2.940 | 0.006* |
| Sodium restriction in food and monitoring of drinking water after treatment | 3.08 | 0.43 | | |
| Taking medication according to the doctor's treatment plan before treatment | 3.67 | 0.42 | 1.153 | 0.258 |
| Taking medicines according to the doctor's treatment plan after treatment | 3.75 | 0.33 | | |
| In the use of other medicines, herbs, bolus dose or dietary supplements before treatment | 3.70 | 0.45 | 1.564 | 0.129 |
| In the use of other medicines, herbs, bolus dose or dietary supplements after treatment | 3.78 | 0.40 | | |
| Monitoring and management of symptoms caused by sodium and excess water before treatment | 3.08 | 0.75 | 2.151 | 0.040* |
| Monitoring and management of symptoms caused by sodium and excess water after treatment | 3.34 | 0.49 | | |
| Overall score before treatment | 3.12 | 0.37 | 3.182 | 0.003* |
| Overall score after treatment | 3.31 | 0.30 | | |

* Statistically significant 0.05

**Quality of Life of Clients**

Before treatment, most of the clients were not walking (60%). While 73.33% had no problems in bathing or wearing their clothes, 86.67% had issues with pain or physical discomfort. Some of them faced problems in performing regular activities and experienced anxiety or depression (66.67%).

After the treatment, the number of clients with such issues had decreased. Improvement in their general health had improved their quality of life. They are classified into 3 groups on the basis of their problems:

1) Initially 66.67% had problems in performing routine activities and experienced anxiety or depression, but after therapy the figure went down to 43.33%. The percentage of clients who complained of pain or discomfort reduced slightly from 86.67% to 83.33%.

2) Among those with walking problems (12 individuals or 40%), no difference was found after treatment.

3) The number of clients who had problems in bathing or putting on their clothes increased after treatment from 26.69% to 33.33%. It is possible that the clients' ability to help themselves deteriorates as the duration of illness increases. The data is shown in Table 4.

**Table 4: General quality of life of clients**

| Health dimension | Quality of life | Before | | After (6 months) | |
|---|---|---|---|---|---|
| | | Amount | % | Amount | % |
| Mobility | 1. No problem walking | 18 | 60.00 | 18 | 60.00 |
| | 2. Have a problem | 12 | 40.00 | 12 | 40.00 |
| Help yourself for bathing and wearing | 1. No problem | 22 | 73.33 | 20 | 66.67 |
| | 2. Have a problem | 8 | 26.67 | 10 | 33.33 |
| Doing regular activities | 1. No problem | 10 | 33.33 | 17 | 56.67 |
| | 2. Have a problem | 20 | 66.67 | 13 | 43.33 |
| Pain or discomfort | 1. No problem | 4 | 13.33 | 5 | 16.67 |
| | 2. Have a problem | 26 | 86.67 | 25 | 83.33 |
| Anxiety or depression | 1. No problem | 10 | 33.33 | 17 | 56.67 |
| | 2. Have a problem | 20 | 66.67 | 13 | 43.33 |

**Client Satisfaction from Admission to Treatment**

Over fifty-nine percent (59.26%) of clients rated the heart failure clinic as being excellent. Furthermore, the mean satisfaction rating of 3.59 out of a 4 is high. Satisfaction levels for individual aspects of the service give a different view. Clients are most satisfied with the information, advice, problem-solving, and

clarification of queries given by the health staff: a mean score of 3.68 points. This was followed by satisfaction of clients with the behavior of health staff with a mean of 3.64: e.g. good manners in welcoming and caring for customers. Satisfaction with time spent at the health centre was slightly less valued with a mean of 3.26. Finally, satisfaction with the facility itself was rated lowest with a mean of 3.18. In conclusion, the scores indicate that clients were quite satisfied with the services (See Table 5).

**Table 5: Number, percentage, mean and standard deviation of client satisfaction**

| Satisfaction issue | Excellent | Good | Medium | Less | Mean | SD |
|---|---|---|---|---|---|---|
| 1. Personnel are courteous to welcome and pay attention to clients | 64.29 | 35.71 | - | - | 3.64 | 0.49 |
| 2. Knowledge of service providing, advice, problem-solving, and clarification of queries by personnel | 67.86 | 32.14 | - | - | 3.68 | 0.48 |
| 3. Appropriateness of service duration | 37.04 | 51.85 | 11.11 | - | 3.26 | 0.66 |
| 4. The service place is clean and convenient, adequate numbers of clean and tidy bathrooms | 35.71 | 50.00 | 10.71 | 3.57 | 3.18 | 0.77 |
| **Overall satisfaction** | **59.26** | **40.74** | **-** | **-** | **3.59** | **0.50** |
| | | | | | | |

## DISCUSSION

In this study, the number of male clients with congestive heart failure was four times more than the female clients. Most of them were around 60 years of age. It shows that heart failure is most likely to occur in the elderly. Part of the problem comes from the elderly being left alone and often lacking in primary caregivers (Piwinram, 2013). However, there are other factors that indicate that the elderly are likely to be affected, such as low levels of education, farming careers, or no occupation, no income, making it difficult for them to reach a good healthcare system (Thepthong, 2012; Amporn, 2018). Since more than 70% of the clients in the sample were using the free public health benefits (gold card), it is likely that

their heart failure had other causes, including coronary heart disease and high blood pressure (Smeltzer, 2015).

By understanding the self-care of clients before and after treatment, many issues can be dealt with and clients can be guided in the right direction. It is important to limit sodium and control excessive drinking of water, and to take medication according to the doctors' prescribed treatment and supervision. Management of symptoms of excessive sodium intake can be done by watching relevant videos, reading manuals, or through telephone consultations. All these methods are to encourage clients to have correct knowledge and understanding in taking care of themselves efficiently (Pelico, 2013). On the other hand, there are some issues such as knowledge and understanding of exercise, in which there has been almost no change after treatment. It is possible that the client has knowledge and understanding, but cannot put it into practice. Therefore, the case management approach should be appropriate for each client, such as introducing light exercises for those who require it. Even walking is useful to help strengthen the body. In some cases, clients cannot exercise because of their physical condition. They tire easily because of reduced blood volume. The solution to this problem is to reduce activities by about 70% (Blinderman et al, 2008). However, case management is still very important in order to reduce the rate of recurrence as much as possible.

With regard to self-care behavior, after treatment there was an improvement in some areas, such as decreasing rates of taking herbal medicine, bolus dose or dietary supplements. Clients also began to pay attention to medication according to the doctor's treatment plan. They read the drug labels and followed the doctor's prescription. The reason could be anxiety that their illness would become worse. Moreover, they had faith in the advice of people who were knowledgeable and convincing, such as medical personnel, nurses, etc. In contrast to these changes, however, the clients continued to eat salty food. This deeply ingrained personal preference has become permanent behavior which is difficult to change and is a barrier to protecting themselves from heart failure. Instead of controlling sodium intake in food, they continued to prefer to cook with fish sauce, salt, soy sauce, soup cubes, and monosodium glutamate. They were also in the habit of buying ready-to-eat food from stores or markets. There is a risk of high levels of sodium in these foods (Sutthichareon, 2015). However, individual case management can be used to solve these problem behaviors. It can make the client aware of the importance of reducing or stopping the behavior that is detrimental to his/her treatment.

Case management also places great importance on the satisfaction of clients with services received. This leads to better cooperation with the course of treatment. Client satisfaction has many aspects. The first is satisfaction with the expertise of the personnel who provide information and advice to solve clients' problems. Next is satisfaction with the courtesy shown in the hospital, the enthusiasm and service of the medical personnel. Finally is their satisfaction with the cleanliness, comfort, and orderliness of the premises, such as having clean and adequate number of bathrooms. Since case management is effective for self-care of clients, the aspect of satisfaction should also be looked into in order to gain clients' cooperation.

**Limitations**

The study has several limitations. As a quasi-experimental research work, there are limitations to the internal fidelity of implementation. That is to say, there was a wide time span in the data collection period after the first treatment of the sample. Some clients returned to treatment within 1 month, while others took more than 3 months to revert. These factors, as well as different behavior patterns among clients, affect knowledge and understanding. Moreover, the clients in the sample group may have different characteristics and live in different environments, and this study has not focused on the individual factors that go into their care. In fact, the knowledge and capabilities of caregivers may vary greatly, and it is difficult to control such variables as the quality of caregivers, their knowledge, and their understanding. It is possible for other variables to influence the results of the study. Ultimately, the results of the single data collection cannot be relied on totally. For greater reliability, it is recommended that future studies should control other relevant factors. Additionally, the study of these factors should be further expanded to include issues such as the quality of caregivers.

## CONCLUSION

The approach to care for clients with heart failure admitted to the heart failure clinic uses the case management model in its multidisciplinary team approach. In such a model there should be one person as a liaison between the client and the healthcare professional over time (Amaritakomol, 2018). For example, when a client is in need of medical assistance, the nurse will coordinate the patient's visit to a doctor during that time. Also, in case the client is confused about taking medicine, the nurse will help to contact and coordinate with the pharmacist to gain

the necessary knowledge and understanding and inform the patient accordingly. Moreover, case management increases the likelihood that each client receives accurate information on how to best care for themselves.

In addition, each client had different levels of illness, a different economic status, different levels of knowledge of self-care, and there are also caregivers with different abilities. This study confirmed that a case management approach helps in solving a wide range of issues, giving each client the most comprehensive and timely care as possible. Furthermore, this approach helps nurses to manage a wider variety of cases. The continued improvement and development of a case management approach will help to achieve better quality of client care.

Prior to 2017, clients at KKU-HF Clinic had an average rate of recurring hospitalization within one year at 2.41 times per person. But after the group of clients who participated in a case management program, within one year the rate of re-hospitalization was reduced to 0.1 times per person. Case management of clients with heart failure is therefore likely to be one of the best and appropriate ways to manage clients and it is recommended to study opportunities to scale-up this approach to the care of such clients in other hospitals as well.

## ACKNOWLEDGEMENT

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