IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e- ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 7, Issue 2 Ver. IV (Mar-Apr .2018), PP 29-36
www.iosrjournals.org

A Self-Care Programme with Home-Based Exercise Improves Quality of Life in Patients with Heart Failure

Huey L. Liou[1] , Mei H. Chen[1] , Yueh L. Shih[1] , Su Y. Hung [2] , Kwei C. Chung[1] , Yu T. Huang[1] , Miao C. Lai [3]

[1] *(Department of Nursing, Taipei Veterans General Hospital, Taipei, Taiwan)*
[2] *(Department of Physical Medicine and Rehabilitation Physical Therapy, Taipei Veterans General Hospital, Taipei, Taiwan)*
[3] *(Department of Nursing, National Yang-Ming University Hospital, Taiwan)*
Corresdponding author: Huey L. Liou[1]

Abstract: *Although clinical evidence suggests that an exercise training programme for patients with heart failure is a good for patients with heart failure, but the implementation rate is low. The aim of the present study was to investigate the effectiveness of a self-care programme with home-based exercise training on compliance, physical function and quality of life in heart failure patients. All of the patients involved in the study participated in self-care programmes, and subjects were allocated into either a usual exercise (UE, n = 41) group or a cardiac rehabilitation group (CR, n = 30). For all participants, we measured the Kansas City Cardiomyopathy Questionnaire (KCCQ) and the New York Heart Association (NYHA) functional class a total of four times during the study period. Results for compliance with home-based exercise, hospital readmissions and mortality rates were also collected. The study findings revealed that compliance with home-based exercise at 3 months was similar in both groups (46.3% vs. 50% in the UE group and CR group, respectively, P = 0.76). The study also found that the self-care programme with home-based exercise after 3 months revealed significant increases in the 5 KCCQ domains in both the UE and CR groups. There was no significant difference in physical function. Present study showed that a self-care programme with home-based exercise may enhance heart failure patients' quality of life. Therefore, we recommend that a self-care home-based exercise programme be included in the guidelines for routine hospital-discharge planning.*

Keywords: *Heart failure, Home-based exercise with self-care programme, Quality of life.*

Date of Submission: 09-03-2018 Date of acceptance: 28-03-2018

I. Introduction

Heart failure (HF) is a global commonality of chronic diseases that increase the utilization of health resources[1, 2]. HF drug therapy can reduce mortality and morbidity, but many patients still struggle with poor endurance, fatigue, difficulty breathing and other symptoms. Therefore, improving clinical symptoms and quality of life through methods other than drug therapy is another important goal of HF treatment. Since the 1990s, a number of studies have demonstrated that cardiac rehabilitation can improve symptoms of fatigue and shortness of breath, reduce readmission rates, and improve quality of life in patients with heart failure[3-5]. The American Association of Cardiovascular (ACC) and Pulmonary Rehabilitation recommendation [6] suggests that the goal of patients' cardiac training is to make the exercise intensity achieve the maximum heart rate 60–80% or the Borg rating of perceived exertion of 11 to 13 points[7], every 10–60 min, 3–5 times a week.[6] Recent systemic reviews and meta-analysis showed that home-based and centre-based cardiac rehabilitation the results revealed similar improvements in exercise tolerance, self-efficacy, quality of life, and reduction in hospital admission and mortality[8-10].

Heart failure patients' exercise has been widely accepted as part of the management plan, and compliance with prescribed exercise is affected by many factors, such as patient-related factors, social and economic factors, the healthcare system, condition-related factors, and therapy-related factors[11]. In the van der Wal et al.[12] survey of 501 patients with heart failure, 80% of patients believed that exercise had a positive effect on health, but only 39% of patients were willing to engage in regular exercise.

Self-care is an individual on the basis of their beliefs to perform health promotion, disease prevention or maintenance of a sense of well-being in particular behaviors[13]. The relevant literature indicates that promoting patients' regular exercise through regular telephone or face-to-face contact can increase the use of a pedometer and audio-visual materials at home and thus increase the effect of exercise training [9, 14,15]. However, in our hospital, most of the care interventions used in patients with heart failure only focus on providing education related to risk factors and symptoms, with little or no formal education on home-based exercise. Therefore, the purpose of this study was to investigate the effectiveness of a self-care programme with home-based exercise training by nurse-lead instruction on compliance, physical function and quality of life in patients with heart failure.

III . Material And Methods

A quasi-experimental study was used to investigate the effectiveness of a self-care programme with home-based exercise on heart failure patients. This study was conducted in Taipei Veterans General Hospital, Taiwan, from April 2013 to June 2015. Participant-inclusion criteria were that patients were conscious, over 30 years old, and were able to communicate and to listen, speak, read, and write. The subjects were diagnosed as having congestive heart failure (systolic or diastolic dysfunction), a chest X-ray showed pulmonary edema or left ventricular ejection fraction of less than 40%, and

subjects were in the New York Heart Association (NYHA) functional class I–III. A total of 71 participants were recruited into either the home-based usual exercise (UE, n = 41) or the cardiac rehabilitation group (CR, n = 30) by convenience sampling. This study was approved by the Institutional Ethical Board of Taipei Veterans General Hospital, Taipei, Taiwan.

2.1-Intervention

- **Self-Care Programme**

Each participant received a one-day-long individual self-care training session (developed in previous research[16]) within one week of admission. The session included recognition of HF, adherence to prescription medication, dietary guidance, compliance with a low-salt, low-fat diet, limiting water intake, exercise guidelines, enforcement of lifestyle changes, assessment of the symptoms, and management of symptoms. After the self-care teaching session, patients received a teaching booklet and video-tape on self-care, as well as a daily log (recorded blood pressure, heart rate, diet, exercise and symptoms). Four care providers trained in interview techniques participated in all teaching instruction and all questionnaires, both during the validation process and with the study subjects, to maintain consistency in responses. Care providers carried out follow-up telephone calls at intervals of one week for the first month, every two weeks for the second month, and once during the third month after hospital discharge to obtain feedback from participants regarding their adherence to overall self-care and compliance with the exercise program.

- **Exercise Programmes**

Subjects with CHF discharged from hospital were invited to participate in a 12-week home-based cardiac rehabilitation exercise programme. The home-based cardiac rehabilitation exercise programme mainly used modified group-based aerobic interval training [17]. Before hospital discharge, a team consisting of nurses and physiotherapists instructed subjects in the home-based exercise of the cardiac rehabilitation programme. After hospital discharge, participants performed exercise training following the video or the teaching booklet, beginning with a warm-up, followed by high-intensity exercise, stretching, calisthenics, and finally a cool-down. Each exercise session lasted 10–30 min, 3 times weekly. Subjects were instructed to exercise at an 11–13 point intensity level based on Borg Rating of Perceived Exertion [17]. Participants in the control group were discharged from hospital and performed usual exercise, but they did not do the home-based cardiac rehabilitation programme exercise.

2.2- Measurements

The study questionnaire included demographic charracteritics and the Kansas City Cardiomyopathy Questionnaire (KCCQ).

The KCCQ is an HF specific measure of health status and quality of life. The original version of the KCCQ is composed of 23 items divided into 5 domains: physical limitations, symptoms, quality of life, self-efficacy, and social interference. Scale scores are transformed to a 0 to 100 range by subtracting the lowest possible scale score, dividing by the range of the scale and multiplying by 100, higher scores indicating better health[18]. The KCCQ, originally written in English, was translated into Mandarin, and then bilingual experts reviewed the English version and the translation to ensure there were no original-scale discrepancies in meaning. KCCQ subjects are requested to answer the 15 questions using Likert scales[18]. The reliability and validity of this instrument were confirmed in previous research. In the present study, the Cronbach's α was 0.86 for physical limitation, 0.88 for symptoms, 0.78 for quality of life, 0.74 for self-efficacy,0.92 for social interference [18]. In order to facilitate interpretation, two KCCQ summary scores were developed, with a range of 0 to 100, and higher scores indicating a better health status. Functional status score combined the physical limitation and symptom domains. The clinical summary score included the quality of life and social limitation domains. Both KCCQ summary scores were correlated with the NYHA class and were significantly lower than the baseline scores of patients who died or those who were readmitted between event-free survival, respectively[18]. In the present study, the Cronbach's α was 0.91 for the functional status score and 0.91 for the clinical summary score.

2.3-Outcome Measures

The primary outcome was the rate of compliance with the exercise prescription (3 times a week, each time for 10–30 min) during the study period (3months). The KCCQ and NYHA (New York Heart Association) functional class were measured before education (T0), and then at one month (T1), two months (T2), and three months after hospital discharge (T3). Secondary outcome measures included hospital readmissions and mortality rate.

II. Statistacial Analysis

Data are presented as means ± standard deviation (SD) or as numbers (percentages) as appropriate. Statistical analysis was performed with SPSS software (version 17.0 for Windows, Chicago, IL). The difference between the control and the experimental groups on the demographic outcome data was analyzed by independent *t* test or X^2-test. The Mann-Whitney U test was employed to compare the differences between the two groups. Logistic regression was used to examine the relationships of outcome factors with the selected characteristics between the two groups. Multiple regression was used to analyze the predictor of the two summary scores. Repeated general linear model (GLM) measurements were used to analyze the time series design to test for differences between and within subjects as appropriate. A P value < 0.05 was considered to be statistically significant. A sample size of 92 was justified based on the regression equation model testing using G-power 3.0[19]. A minimum sample size of 70 was estimated, given an effect size of 0.2, an alpha of 0.05, and a power of 0.80 with five variables entered as independent variables in separate regression equation model testing.

III. Results

Table 1 presents clinical and demographic characteristics. There was no significant difference between the two groups. The rate of compliance with the home-based exercise prescription for those who exercised at least three times a week, each time for 10–30min, at 3 months was similar for the two groups (46.3% vs. 50% in the UE group and CR group, respectively, $P > 0.05$) (Table 1). Overall, 30-day hospital readmission was 11.3 % in this HF population (7.3% vs. 16.7% in patients with the control group and the experimental group, respectively, $P > 0.05$). The logistic regression analysis has been adjusted for gender and NYHA functional class at admission for rate of a 30-day hospital readmission, a 3-month hospital readmission and a 3-month mortality rate. There were also no significant differences between the two groups.

The results of the series of four measurements of KCCQ and the summary score of the functional status and clinical summary showed no significant differences between the two groups based on GLM analysis (Table 2). The effects of physical limitation, symptoms, self-efficacy, social interference and quality of life were significantly changed over the first months, and these changes persisted for 3 months within the groups. However, in the present study, the score of self-efficacy and quality of life in KCCQ, especially in the CR group, continued to increase, whereas there was no significant difference between the two groups (Figure 1 A, B, C, D, E). The self-care program with the home-based exercise UE group and the CR group also had a significant effect on the summary score of functional status and clinical summary over time for 3 months (Figure 2A, B). The NYHA functional class was not significantly improved after discharge in both groups.

On linear regression analysis, five variables (age, gender, level of education, number of comorbidities, total exercise minutes during 3 months) were subjected to examine the predictors of functional status and clinical summary at third month. Total exercise minutes during 3 months could predict 19% of functional status at third month. Number of comorbidities and total exercise minutes during 3 months could predict 24% of clinical summary at third month (Table 3).

IV. Discussion

Compliance is defined by the World Health Organization (WHO) as the extent to which the behavior corresponds with the agreed-upon recommendations from a health care provider [20]. Factors associated with compliance can be divided into patient-related factors, regimen-related factors, and factors related to the health care provider [11,12, 21] . In the current study, compliance with the home-based exercise prescription at 3 months was similar between the two groups (46.3% vs. 50% in the UE group and CR group, respectively). According to the study, although 80% of patients reported that exercise was important, the compliance rate was low, with only 39% of patients meeting exercise recommendations, and the main reason for this lack of compliance was the patients' physical condition[12]. In the present study, participants, either in the control or the experimental groups, self-declared that 40–50% discontinued exercise also due to physical conditions. Studies had shown that increased self-efficacy during exercise could predict physical activity in HF and had a positive effect on exercise compliance in HF[15,22,23] . Self-efficacy can be achieved by supervised exercise training, peer support and seeing peers exercising, realistic goal setting and support from family and friends[23]. In the current study, the self-efficacy of KCCQ changed significantly in the first month, and these changes persisted for 3 months in both groups, especially in the CR group, although there was no significant difference between the two groups. Thus, this self-care programme and home-based exercise will increase compliance and promote adaptation to new health practices as a habit of improving the quality of life. In 2003, the American Heart Association published a statement on exercise in congestive heart failure (CHF) patients that declared exercise to be safe and beneficial for that patient population, specifically with regard to exercise capacity and quality of life[24]. Short-term exercise training in patients with CHF had a positive impact on physical performance[10,25], quality of life [10,25,26], morbidity and mortality[19,38]. Home-based exercise for heart disease patients with simple heart attacks had been developed as a model of care focusing on the elderly, particularly those with chronic diseases, as it may be difficult to ensure reliable transportation to participate in hospital-based or rehabilitation-based exercise programs[8,10,26-28]. Several studies had demonstrated that comparing home-based cardiac rehabilitation with supervised center-based cardiac rehabilitation programmes had been associated with variable results[8,12,27,28]. A supervised home-based exercise programme and disease management following HF patients reported after 12 months of follow-up that participants reflected a positive change in perceived symptoms in the intervention group[28]. In the present study, a self-care programme was applied with home-based exercise UE and CR. Participants positively evaluated the home-based exercise programme, attaching importance to health service providers' additional phone contact, and improved overall reporting on physical limitations, symptoms, self-efficacy, social interference and quality of life during the three-month follow-up period.

Exercise persistence is the accumulation of time from start to stop of work measured from a measured time (e.g. number of weeks / month, and so on until stopped). As any healthy individual finds with exercise, physical activity can lead to fatigue until the individual becomes adequately fit to endure a particular level of training[20] . For HF patients with poor endurance, the ability to exercise depends on their functional status. In the absence of dyspnea and discomfort, by slowly increasing the activity, patients can refer to a perceived Borg score of 11–13 points (patients can also move the scene during the dialogue). Participants may adhere to some short-term exercise; if they cannot complete the exercise programme, patients can consider the completion of sub-times[23]. In the present study, two groups of home-based exercise training patients under the self-care programme were able to progressively increase their exercise time over a three-month follow-up period, thereby improving their health status and quality of life. Overall, the total exercise minutes over three months independently predicted the variation of the KCCQ clinical summary and functional score. According to this evidence, the prediction of the patients' clinical summary and functional score variation in KCCQ demonstrates that the cumulative duration of regular exercise has a significant benefit to the quality of life of patients with heart failure. Co-morbidities frequently accompany heart failure (HF), leading to increase morbidity and mortality, and impaired quality of life[29]. In van Deursen et al conducted a pilot survey[29], co-morbidities were prevalent in chronic HF patients and were related to the severity of the disease. In current study, on linear regression analysis, co-morbidities can explain the 24% variance in clinical summary score. This study finding is consisitent with other studies demonstated quality of life clinical outcome is significantly affected by co-morbidities [29]. The KCCQ summary score has been shown to be reliable and highly responsive

to the clinical changes that cardiologists consider important[18] . It had been reported in the literature that a low KCCQ summary score was an independent predictor of poor prognosis in outpatients[30]. In the present study revealed that a lower KCCQ summary score at the third month was more likely to be associated with mortality but not rehospitalization, whereas a lower KCCQ summary score was associated with a higher NYHA functional classification.

V. Limitations

This study also had several limitations. First, because the sample was recruited from one medical center hospital and included a high percentage of males, the sample's characteristics may not represent the general population of HF patients. Second, the convenience sampling and non-blind nature of this study may raise potential bias. Further research using an equivalent control group and randomized control design may exclude interference by other factors. Finally, present study evealed that the self-care programme with home-based exercise had a positive impact on quality of life during the 3-month period. Further research may track over a longer period in order to verify the measurement of the intervention effect.

VI. Conclusions

Present study revealed that combination of home-based exercise and self-care programmes can enhance patients to perform home-based exercise and improve health status and quality of life in patients with heart failure.

Acknowledgments

This study was supported by grants from the Taipei Veterans General Hospital, Taipei, Taiwan (VGH102C-209).The authors would like to thank Jiu Wen, Tang for assisting in the demonstration of motion video.

References

[1]. Young, J. B. (2004). The global epidemiology of heart failure. Medical Clinics of North America, 88(5), 1135-1143.
[2]. Clark, A. M., Freydberg, N., Heath, S. L., Savard, L,, McDonald, M., & Strain, L. (2008). The potential of nursing to reduce the burden of heart failure in rural Canada: what strategies should nurses prioritize? Canadian Journal of Cardiovascular Nursing, 18(4), 40-46.
[3]. Ismail, H., McFarlane, J. R., Nojoumian, A. H., Dieberg, G., & Smart, N. A. (2013). Clinical outcomes and cardiovascular responses to different exercise training itensities in patients with heart failure: A systematic review and meta-analysis. JACC Heart Failure, 1(6), 540-547.
[4]. Bocalini, D. S., dos Santos, L., & Serra, A. J. (2008). Physical exercise improvesthe functional capacity and quality of life in patients with heart failure. Clinics (Sao Paulo), 63(4), 437-442.
[5]. van Tol, B. A., Huijsmans, R. J., Kroon, D. W., Schothorst, M., & Kwakkel, G. (2006) . Effects of exercise training on cardiac performance, exercise capacity and quality of life in patients with heart failure: a meta-analysis. European Journal of Heart Failure,z8(8), 841-850.
[6]. American Association of Cardiovascular and Pulmonary Rehabilitation. (2004). Guidelines for cardiac rehabilitation and secondary prevention programs (4th ed.):Human Kinetics.
[7]. Borg , G. A. (1982) . Psychophysical bases of perceived exertion. Medicine and Science in Sports and Exercise , 14(5), 377-381.
[8]. Anderson L, Sharp GA, Norton RJ, Dala, H., Dean, S. G., Jolly, K., Cowie, A., Zawada, A., & Taylor, R.S. (2017). Home-based versus centre-based cardiac rehabilitation. Cochrane Database Systematic Review. 6, CD007130.
[9]. Hwang, R., Redfern, J., & Alison, J. (2008). A narrative review on home-based exercise training for patients with chronic heart failure. Physical Therapy Reviews, 13(4), 227-236.
[10]. Taylor RS, Dalal H, Jolly K, Zawada, A., Dean, S. G., Cowie, A., & rebecca, J. N. (2015). Home-based versus centre-based cardiac rehabilitation. Cochrane Database Systematic Review, 18(8), CD007130.
[11]. Conraads, V. M., Deaton, C., Piotrowicz, E., Santaulari, N., Tiemey, S., Piepoli, M. F., Schmid, J. P., Dickstein, K., Ponikowski, P. P., & Jaarsma, T. (2012), Adherence of heart failure patients to exercise: barriers and possible solutions: a position statement of the study group on exercise training in heart failure of the Heart Failure Association of the European Society of Cardiology. European Journal of Heart Failure, 14(5), 451-458.
[12]. van der Wal, M. H., Jaarsma, T., Moser, D. K., Veeger, N. J., van Gilst, W. H., & van Veldhuisen, D. J. (2006). Compliance in heart failure patients: the importance of knowledge and beliefs. European Journal of Heart Failure, 27(4), 434-440.
[13]. Orem, D. (2001). Nursing: concepts of practice. 6th ed. St Louis:Mosby..
[14]. Duncan, K. A., & Pozehl, B. (2002). Staying on course: the effects of an adherence facilitation intervention on home exercise participation. Progress in Cardiovascular Nursing, 17(2), 59-71.
[15]. Gary, R. (2006). Exercise self-efficacy in older women with diastolic heart failure: results of a walking program and education intervention. Journal of Gerontological Nursing, 32(7), 31-39.
[16]. Liou, H. L., Chen, H. I., Hsu, S. C., Lee, S. C., Chang, C. J., & Wu, M. J. (2015). The effects of a self-care program on patients with heart failure. Journal of the Chinese Medical Association, 78(11), 648-656.
[17]. Nilsson, B. B., Hellesnes, B., Westheim, A., & Risberg, M. A. (2008). Group-based aerobic interval training in patients with chronic heart failure: Norwegian Ullevaal Model. Physical Therapy, 88(4), 523-535.
[18]. Green, C.P., Porter, C. B., Bresnahan , D. R., & Spertus, J. A. (2000). Development and evaluation of the Kansas city cardiomyopathy questionnaire: a new health status measure for heart failure. Journal of the American College of Cardiology, *35*(5), 1245-1255.
[19]. Faul, F., Erdfelder, E., Lang, A.G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, 39, 175-191.
[20]. Sackett, D. L., & Haynes, R. B.(1976). Compliance with Therapeutic Regimens. Baltimore:Johns Hopkins University Press.
[21]. Dolansky, M. A., Stepanczuk, B., Charvat, J. M., & Moore, S. M. (2010). Women's and men's exercise adherence after a cardiac event: Does age make a difference? Research in Gerontological Nursing , 3(1), 30-38.
[22]. Pozehl, B., Duncan, K., Hertzog, M., & Norman, J. F. (2010). Heart failure exercise and training camp:Effects of a multicomponent exercise training intervention in patients with heart failure. Heart Lung, 39(6 Suppl), S1-S13.
[23]. Tierney, S., Mamas, M., Woods, S., Rutter, M. K., Gibson, M., Neyses, L., & Deaton, C. (2012). What strategies are effective for

exercise adherence in heart failure? A systematic review of controlled studies. Heart Failure Review, 17(1), 107-115.
[24]. Pina, I. L., Apstein, C. S., Balady, G. J., Belardinelli, R., Chaitman, B. R., & Duscha, B. D. (2003). Exercise and heart failure: a statement from the American Heart Association Committee on exercise, rehabilitation, and prevention. Circulation, 107(8), 1210-1225.
[25]. Sagar, V. A., Davies, E. J., Briscoe, S., Coats, A. J. S., Dalal, H. M., & Lough, F. (2015). Exercise-based rehabilitation for heart failure: systematic review and meta-analysis. Open Heart, 2(1), e000163.
[26]. Taylor, R. S., Dalal, H., Jolly, K., Moxham, T., & Zawada, A. (2010). Home-based versus centre-based cardiac rehabilitation. Cochrane Database Systematic Review. 20(1), CD007130.
[27]. Buckingham, S. A.,Taylor, R. S., Jolly, K., Zawada, A., Dean, S. G., Cowie, A., Norton, R. J., & Dalal, H. M. (2016). Home-based versus centre-based cardiac rehabilitation:abridged Cochrane systematic review and meta-analysis. Open Heart, 3(2), e000463.
[28]. Wall, H. K., Ballard, J., Troped, P., Njike, V. Y., & Katz, D. L. (2010). Impact of home-based, supervised exercise on congestive heart failure. International Journal of Cardiology, 145(2), 267-270.
[29]. van Deursen, V. M., Damman, K., van der Meer, P., Wijkstra, P. J., Luijckx, G. J., van Beek, A., van Veldhuisen, D. J., & Voors, A. A. (2014). Co-morbidities in heart failure. Heart Failure Review, 19(2), 163-172.
[30]. Heidenreich, P. A., Spertus, J. A., Jones, P. G., Weintraub, W. S., Rumsfeld, J. S., & Rathore, S. S. (2006). Health status identifies heart failure outpatients at risk for hospitalization or death. Journal of American College Cardiology, 47(4), 752-756.

Table 1 Demographics and Clinical Characterisitics of Participants

Characterisitic	Control (n = 41)	Experimental (n = 30)	Total (n = 71)
Age, y	71.4± 15.2	65.2 ± 13.7	68.8± 14.8
LVEF, %	41.8± 16.9	38.7 ± 14.6	40.3± 15.8
Male	28.0 (68.3%)	22.0 (73.3%)	50.0 (70.4%)
NYHA classification at admission			
Class I	1 (2.4%)	4 (13.3%)	5 (7.0%)
Class II	18 (43.9)	11 (36.7%)	29 (40.8 %)
Class III	22 (53.7%)	15 (50.0%)	37 (52.1%)
Class IV	0 (0%)	0 (0%)	0 (0%)
Number of previous HF admission			
0	5 (12.2%)	10 (33.3%)	15 (21.1%)
1-3	29 (70.7%)	17 (56.6%)	46 (64.8%)
>3	7 (17.1%)	3 (10.0%)	10 (14.1%)
Number of co-morbidities			
0	2 (4.9%)	1 (3.3%)	3 (4.2%)
1-3	29(70.7%)	25 (83.3%)	54 (76.1%)
>3	10(24.4%)	4 (13.3%)	14 (19.7%)
Compliance with exercise at the third month			
Yes	19 (46.3%)	15 (50.0%)	34 (47.9%)
No	22 (53.7%)	15 (50.0%)	37 (52.1%)
30-day readmission			
Yes	3 (7.3%)	5 (16.7%)	8 (11.3%)
No	38 (92.7%)	25 (83.3%)	63 (88.7%)
90-day readmission			
Yes	1 (2.4%)	3 (10.0%)	4 (5.6%)
No	40 (97.6)	27 (90.0%)	67 (94.4%)
30-day mortality			
Yes	0 (0%)	0 (0%)	0 (0%)
90-day mortality			
Yes	0 (0%)	2 (6.7%)	2 (2.8%)
No	41 (100%)	28 (93.3%)	69 (97.2%)

Data are expressed as numbers (%), or means ± SD(standard deviation); Abbreviations: NYHA, New York Heart Association Classification; HF, heart failure; LVEF, left ejection fraction;Comparison of the difference between control group *vs*. experimental group is shown by $P < 0.05$.

Table 2 General Linear Model of Repeat Measure of The Kansas City Cardiomyopathy Questionnaire (KCCQ)

	T0[a] mean ± SD	T1 mean ± SD	T2 mean ± SD	T3 mean ± SD	Between F	Within F	Interaction (variable X group)	Post comparison
Physical limitations					1.25	41.20‡	1.0	
Control (n = 41)	62.7 ± 22.3	65.0 ± 18.7	66.5 ± 19.3	80.6 ± 14.9				T3>T0‡, T3>T1‡, T3>T2‡
Experimental (n = 30)	54.5 ± 22.3	60.6 ± 16.7	62.9 ± 20.7	79.4 ± 19.2				T1>T0*, T3>T0‡, T3>T1‡, T3>T2‡
Symptoms					2.53	33.0‡	4.7‡	
Control (n = 41)	68.8 ± 18.2	73.7 ± 18.2	75.4 ± 14.1	78.9 ± 14.0				T1>T0*, T2>T0†, T3>T0‡, T3>T1*, T3>T2
Experimental (n = 30)	56.4 ± 15.8	68.4 ± 15.8	72.0 ± 17.2	78.3 ± 18.8				T1>T0‡, T2>T0‡, T2>T1*, T3>T0‡, T3>T1‡, T3>T2†
Self-efficacy					0.17	25.46‡	4.27*	
Control (n = 41)	69.5 ± 14.8	73.7 ± 10.9	76.3 ± 10.2	76.4 ± 9.9				T1>T0*, T2>T0†, T3>T0†, T1>T0*, T2>T1*
Experimental (n = 30)	63.0 ± 12.4	72.3 ± 11.0	76.7 ± 11.2	80.3 ± 12.5				T1>T0†, T2>T0‡, T3>T0‡, T3>T1‡, T3>T2*, T2>T1†
Social interference					1.10	10.38‡	2.27	
Control (n = 41)	51.1 + 23.9*	56.1 ± 23.7	57.6 ± 24.2	56.3 ± 23.3				T1>T0*, T2>T0*, T3>T0*,
Experimental (n = 30)	39.2 ± 21.7	50.2 ± 28.4	53.0 ± 29.7	55.7 ± 30.3				T1>T0*, T2>T0*, T3>T0†

Table 2 (continued)

	T0[a] mean ± SD	T1 mean ± SD	T2 mean ± SD	T3 mean ± SD	Between F	Within F	Interaction (variable X group)	Post comparison
Quality of life					0.85	25.41‡	7.28‡	
Control (n = 41)	66.2 ± 16.0†	70.8 ± 12.3	72.9 ± 12.5	72.3 ± 14.4				T1>T0*, T2>T0* T3>T0*
Experimental (n = 30)	54.3 ± 13.8	68.9 ± 14.6	72.2 ± 15.3	76.6 ± 18.6				T1>T0‡, T2>T1‡, T3>T0‡, T3>T1†, T3>T2*
Functional status					1.72	22.79‡	3.78*	
Control (n = 41)	66.8 ± 18.3*	70.4 ± 16.3	72.2 ± 16.2	73.8 ± 15.1				T2>T0*, T3>T0†, T3>T1†,
Experimental (n = 30)	56.8 ± 17.2	65.5 ± 14.5	68.3 ± 16.8	73.8 ± 20.2				T1>T0†, T2>T0†, T3>T0‡, T3>T1†, T3>T2†
Clinical summary					1.58	25.17‡	5.02*	
Control (n = 41)	57.5 ± 16.2*	61.1 ± 14.7	62.7 ± 14.8	63.4 ± 14.0				T1>T0*, T2>T0*,T3>T0†, T2>T1*
Experimental (n = 30)	47.8 ± 14.1	56.9 ± 14.7	59.5 ± 16.1	63.8 ± 18.7				T1>T0†, T2>T0‡, T3>T0‡, T3>T1†, T3>T2†

Data are expressed as means ± SD (standard deviation); Abbreviations: T0, [a] measured before education; T1, one month after hospital discharge; T2, two months after hospital discharge; T3, three months after hospital discharge; Comparison of the difference between control group *vs.* experimental group is shown by *P < 0.05, † P < 0.01, ‡ P < 0.001.

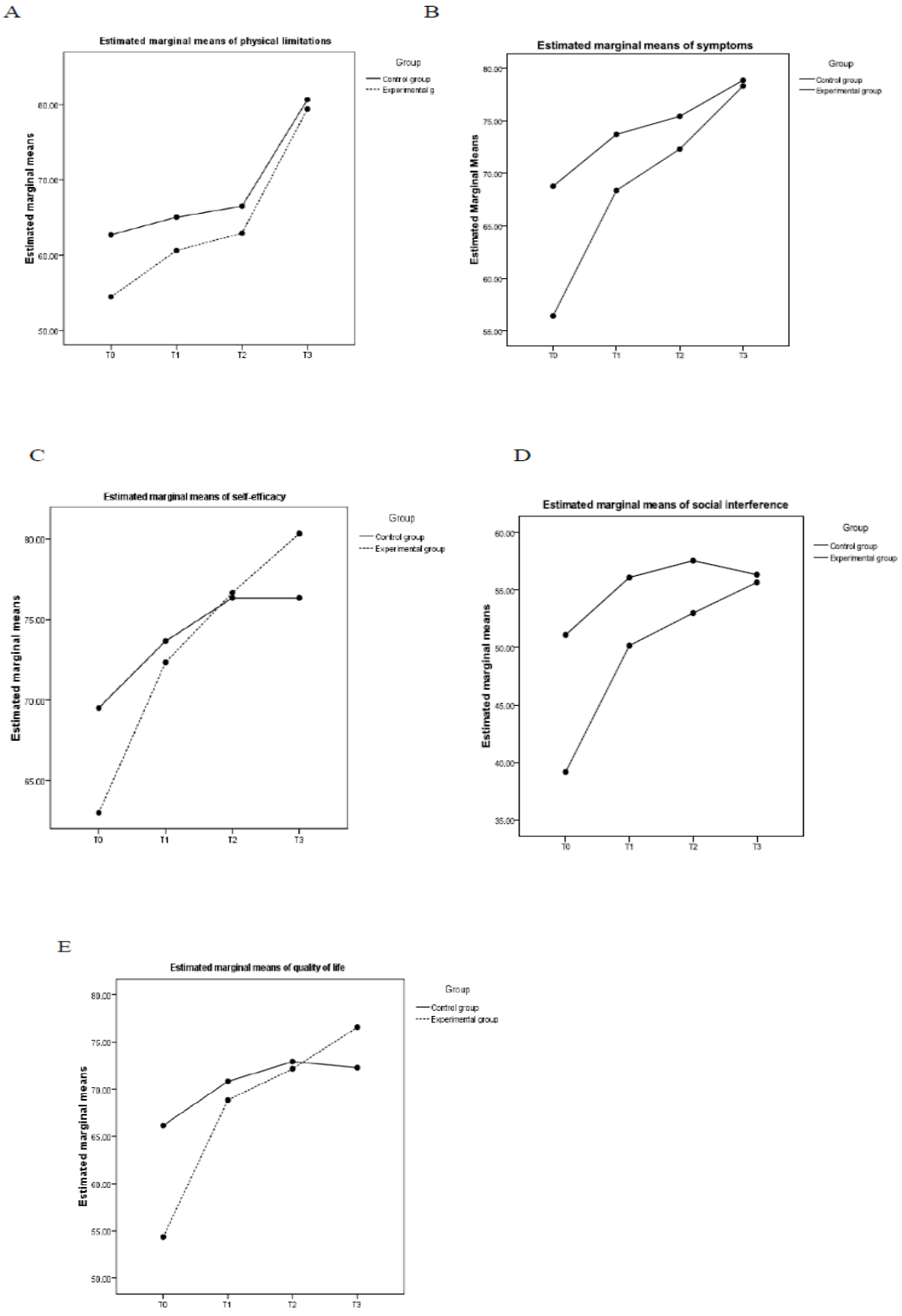

Figure 1. Comparison of physical limitatios (A), symptoms (B), self-efficacy (C), social interference (D), and quality of life (E) at before education (T0), one month after hospital discharge (T1), two months after hospital discharge (T2) and three months after hospital discharge (T3) between the two groups

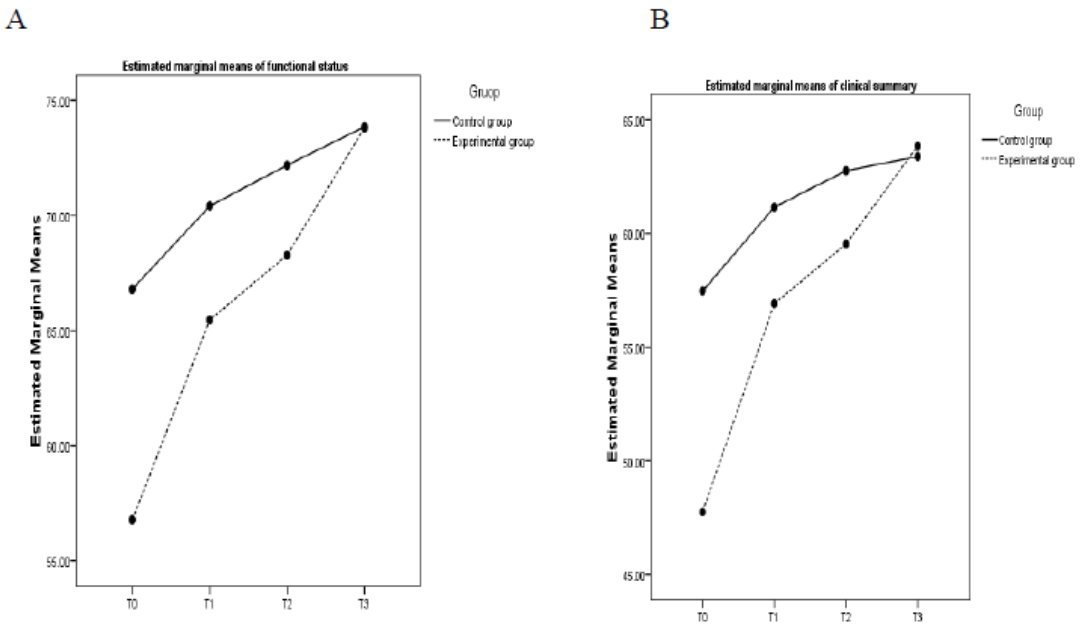

Figure 2. Comparison of functional status (A) and clinical summary (C) at before education (T0), one month after hospital discharge (T1), two months after hospital discharge (T2) and three months after hospital discharge (T3) between the two groups

Table 3 Predictor of Functional Status and Clinical Summary at the Third Month Between Characteristics and Total Exercise DuringThree Months in All Participants (n = 71)

	Functional status				Clinical summary			
Variables	B	Standard Error	R^2	P value	B	Standard Error	R^2	P value
Constant	81.42	14.99	0.19	< 0.001	71.22	13.43	0.24	< 0.001
Age	-0.15	0.16		0.33	-0.17	0.14		0.23
Gender	-6.68	11.14		0.62	2.22	4.46		0.62
Level of education	-0.08	1.20		0.95	0.30	1.08		0.78
Number of co-morbidities	-3.30	1.86		0.08	-3.37	1.66		0.047
Total exercise minutes during 3 months	0.03	0.01		0.005	0.03	0.01		0.002

Age, gender, level of education, number of co-morbidities, and total exercise minutes during 3 months as independent variables were computed in a linear regression analysis; $P < 0.05$ was considered statistically significant.

Huey L. Liou .” A Self-Care Programme With Home-Based Exercise Improves Quality Of Life In Patients With Heart Failure”. IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.2 , 2018, pp. 29-36.