



## Evaluation of the Effect of Educating Self Care Behavior of Heart failure Patients on Economy of Health

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### ABSTRACT

Heart disease is the most costly reason for hospitalization. The purpose of this research was evaluation of the influence of teaching self care behavior for heart failure patients on economy of health in hospitals in the city of Zahedan of Iran in the year 2012. This study was quasi-experimental with a control group in the CCU and Post CCU wards of the hospitals of the city of Zahedan in 2012. The patients were randomly and conveniently placed in two groups of intervention (70 individuals) and control (70). The intervention group received an educational package and three months after discharge, both groups were evaluated using interview and phone follow-up as well as coding system (HIS), frequency of admissions and clinic visits and expenditures partaken. Next using descriptive and analytic statistical tests and the SPSS software version 18, the data was analyzed. The results showed that in the intervention group the percent of attendance to the clinic for health check up on an outpatient basis (visit and EKG) was 25% in three months before intervention and reached 41/6% at three months after intervention. Percent hospitalization in the CCU three months before intervention was 33/3% and reached 13/3% at three months after intervention and the percent change was 20%. Self care teaching program for patients with Heart failure leads to decreased hospitalization and as a result decreased treatment expenditures.

**Key Words:** Education, Heart failure, Self Care, Health Economy

### INTRODUCTION

Cardiovascular diseases are the most prevalent cause of morbidity and mortality in most countries across the world and the most important cause of disability [1]. At the advent of the twenty first century cardiovascular diseases are responsible for almost half of all mortality and morbidity in developed countries and 25% of mortality and morbidity in developing countries. Cardiovascular diseases will be the most important cause of morbidity and mortality in developing countries up to the year 2020 (responsible for one out of three causes of death [1]). The level of morbidity and mortality resulting from cardiovascular disease in Middle Eastern countries are increasingly on the rise and currently are considered the most important cause of death (25 to 45 percent of all morbidity and mortality). The reason for this increase in such societies is change in the economic situation and lifestyle that has led to increased risk factors for cardiovascular disease in these regions [1]. Such diseases are considered the first cause of morbidity and mortality in Iran and they are high health, social and economic burden on society [2]. Most cardiovascular diseases ultimately result in a condition called Heart failure after treatment and care [3].

Congestive heart failure is a pathophysiologic condition in which the cardiac output is not able to provide for the needs of body tissues whether it be oxygen needs or nutrition [4]. The increasing trend of prevalence and incidence of disease in various societies, increased ischemic heart disease and high morbidity and mortality and short life expectancy of patients afflicted with CHF, recurrent hospitalizations along with high costs are among important aspects of Heart failure [5]. Studies have shown that at least 50% of patients with Heart failure do not adhere to their medical recommendations and this matter leads to their recurrent hospitalization and side effects of Heart failure [6]. One of the best ways of preventing the occurrence, progress and arisal of consequences of disease is self care education to the patients [7].

Self care is one of the important aspects of treatment in patients afflicted with Heart failure[2]. Cardiac failure is one of the most prevalent factors leading to recurrent hospital admissions 60 days after discharge [8]. Most studies have shown that nearly 50% of individuals are re-hospitalized due to Heart failure [9]. Heart failure is one of the most costly reasons for hospitalization [2]. It is the main cause of 12 to 15 million office visits and 6/5 million hospital days every year. The cost of rehospitalization of patients in Iran in 2003 was close to 400 million Tomans[8]. Many reasons that lead to lack of medication compliance and exacerbation of Heart failure are preventable using educational intervention. Learning management of chronic conditions forms the main pillar of self care[10]. Studies show that strategies focused on educational needs determined by patients themselves are more successful than educational needs set by others [11]. Increased patient knowledge level by way of teaching self care leads to decreased readmittance especially in wards such as the cardiac and cardiac intensive care units [12]. One of the major causes in promotion of quality of care is patient participation in treatment and self care. Lack of patient awareness of the way of self care with regards to observance of treatment regimens has led to negative consequences on patient health and their recurrent readmission to the hospital [13]. Weak self care behaviors and lack of regimen abiding (nutritional and medicinal) in Heart failure leads to 20-60% increase in rehospitalization[13]. Self care is one of the important aspects of treatment and the basis for management of Heart failure [13]. The latter includes observance of behaviors such as abidance with low salt diet, medical treatment and ... for preserving body physiology and health [14]. Making people aware in the context of disease and risk factors is considered the basis of education and informing, change of outlooks and behaviors are main objectives which lead to disease control and provides for behaviors that prevent ailments [1].

In the study by Askari and colleagues, family centered teaching has been more effective in decreasing cardiac dysrhythmias compared to patient centered education [15]. With consideration of importance of self care teaching to patients and with attention to the costs of rehospitalization of patients afflicted with Heart failure, in this study in addition to educating patients with Heart failure, we will evaluate the influence of this teaching on decreased rehospitalization and ultimately decreased costs.

## MATERIALS AND METHODS

In this study that was experimental, 140 participants afflicted with Heart failure attending Khatam Alambia and Ali Ebne Abitaleb Hospitals of Zahedan were evaluated in two groups of experiment (n=70) and control (n=70). We proceeded with a confidence level of 95% and power of 80% for score differences in self care before and after education based on preliminary studies and the following formula:

$$n = (Z_{1-\alpha/2} + Z_{1-\beta/2})^2 (S_1^2 + S_2^2) / (\bar{x}_1 - \bar{x}_2)^2$$

A number of 53 participants were estimated in each group with attention to the possibility of 15% (17 individual) drop outs. Ultimately in each group 70 individuals were taken into account. A number of 70 participants in each group and in total a number of 140 with opinion of the statistical consultant were selected by convenient sampling. Sampling was as follows. The researcher attended the mentioned hospitals every day and preferentially patients to be discharged in their final days (under conditions that the patient was improving medically and had the necessary preparation for education) individually in the ward (face to face) received necessary information, objectives and study duration by the researcher. After consideration of inclusion criteria and patient consent, pretest questionnaire was completed by the

interviewer. Patients who were evaluated once were omitted in subsequent days. In addition, to prevent bias (influence of various treatments in the two hospitals), the intervention and control group were selected from both hospitals. Thus, 35 intervention and 35 control individuals were selected from Khatam Alanbia and the same from Ali EbneAbitaleb.

When an intervention group was selected from a sample hospital, control group was also selected from the other hospital. It should be noted that in both case and control groups, regular teachings were also provided by ward nurses. Additionally, patients were educated with Sistani dialect by the project designer and Balucchi dialect with the assistance of the local nurse.

Matching in the two groups of intervention and control was performed individually and based on the variables of age and gender.

**Educational Sessions Included:** The first session was in relation with the content of the booklet and was carried out in the form of lecturing for 45 minutes and concurrent show of Bluetooth film, educational CD with the purpose of emphasis on increased awareness, outlook and performance of self care behaviors and was distributed among them. The education session was guided by the researcher.

**Session Two:** The following day, question and answer in relation with educational topics and booklet was held. Ultimately, materials were summarized by the researcher and incorrect information and view points were discussed. Three months after intervention, for follow up of the health situation of the patients and self care behaviors, using the hospital HIS system and phone conversations with patients, number of inpatient days and costs of each hospital day were compared with the situation 3 months prior to the intervention and compared with the control group. (It should be noted that due to teaching each patient individually and on different days, post tests were also conducted individually and at various times).

After collection of information, data was analyzed using descriptive and analytic (independent t-test, paired t-test, Analysis of Variance, Chi-square and correlation coefficient) statistics. Statistical software used was SPSS version 18 with a significance level of 5%.

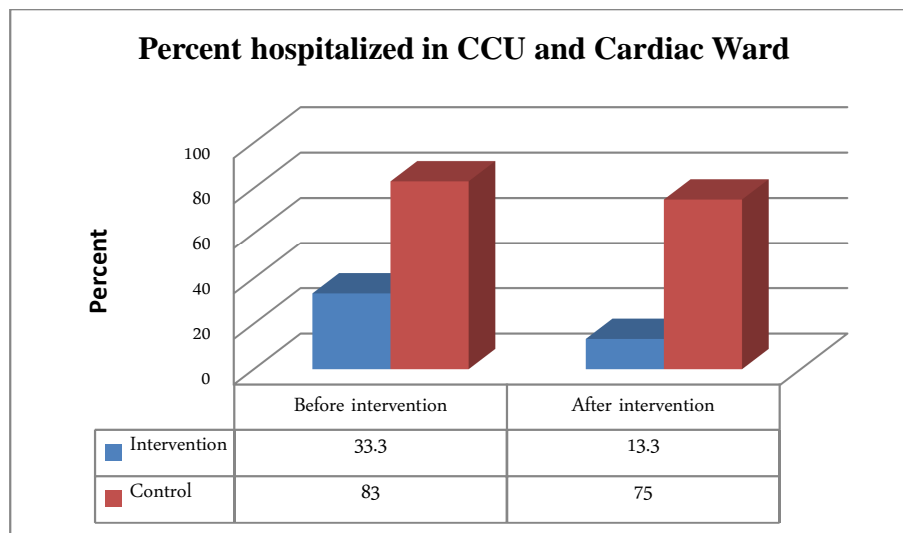
## RESULTS

In this study 140 patients existed in two groups of intervention and control with a mean age of intervention group of  $61/0 \pm 12/2$  and mean age of control group of  $60/8 \pm 12/3$  years. The two groups did not have statistically meaningful difference in age and almost had similar mean ages ( $P > 0/05$ ). With regarding to gender 90 individuals (64/3%) were male and 50 (35/7%) were female.

Mean days of hospitalization (during each cardiac ward stay) in the intervention group was  $5/2 \pm 2/0$  days and in the control group it was  $3/7 \pm 1/2$ . Average number of patient visits for admission to the hospital from 3 months before intervention up to 3 months after that in the intervention group was  $3/2 \pm 1/01$  times and the independent t-test did not show meaningful difference in the two intervention and control groups regarding average number of attendances of each patient for hospitalization ( $P > 0/05$ ).

In the intervention group, mean costs for a patient for one day of hospitalization was  $1215642 \pm 112312$  Rials. Based on mean number of inpatient days in this group which was  $5/2$  days, costs of each inpatient stay in this group for each patient was estimated at  $6321335 \pm 2310232$  Rials. In the control group as well mean cost of each patient for each day of hospitalization was  $2029544 \pm 132652$  Rials and with estimation of  $3/7$  days for each inpatient stay, the total cost was obtained to be  $7509313 \pm 1352147$  Rials ( $P > 0/05$ ).

Percent attendance to the clinic on an outpatient basis (visit, EKG) in the three months before intervention in the intervention group was 25% and in the three months after that it was 41/6%. In the control group in the three months before intervention it was 42/5% and three months after that it was 33/2%. Level of attendance in the intervention group was increased by 16/6% and in the control group it decreased by 9/3% ( $P < 0/001$ ).



Percent of hospitalization in the CCU and Cardiac internal medical ward in the three months before intervention in the intervention group was 33/3% and in the three months after it, it was 13/3% where regarding percent hospitalization in the CCU and cardiac ward before and after intervention significant difference was observed ( $P<0/001$ ). Yet in the control group in the three months before intervention 83% and in the three months after intervention, it was 75%. Paired t-test did not show meaningful difference in the control group regarding percent hospitalization in CCU and cardiac internal ward before and after intervention ( $P>0/05$ ). Yet, frequency of hospitalization in the intervention group decreased 20% and in the control group by 8%. According to the independent t-test, significant difference existed between the control and intervention group regarding percent hospitalization in the CCU and the cardiac ward ( $P<0/001$ ).

## DISCUSSION

In this study it was shown that teaching patients afflicted with Heart failure leads to increased awareness, outlook and performance of self care behaviors and as a result in improved performance and improvement of self care. On the one hand, it leads to decreased hospitalization and as a result decreased costs both for the patient and in a larger scale for the country and society. Since the expectations of the medical team from the patient Heart failure with regards to rehospitalization in the ward after 3 months was 30% and after 6 months 60 percent, the low level of rehospitalization of patients in the intervention group compared to the control group was satisfactory and showed the value of education for economy of health.

This finding agrees with the study by Holland who has showed the influence of intervention programs in change of patient health beliefs for Heart failure and effectiveness on decreased hospitalization frequency for these patients and also decreased level of morbidity and mortality [16]. In a study regarding efficiency of an educational intervention in prevention of readmission of patients afflicted with Heart failure after intervention, significant decrease in serious clinical outcomes and resulting costs in Heart failure patients after intervention has shown significant decrease in serious clinical consequences and costs for patients who underwent intervention.

In the study by Mudge and colleagues in 2010, 200 patients with CHF received necessary teachings in relation with their disease. The frequency of hospitalization in the intervention group was higher. Yet, morbidity and mortality was significantly lower than the control group [17].

In the study by Steventon in 2013, health guidance was provided by phone for 2698 patients and was controlled with a control group with the same number. Frequency of emergency visits and costs of treatment was higher in the case group. Therefore, it was concluded that this educational method does not suffice by itself and cannot decrease costs and visits to the hospital [18].

In the study by Cline also teaching self care to cardiac patients leads to decreased rehospitalization and as a result decreased costs [19].

## CONCLUSION

Considering that self care behavior in patients suffering from Heart failure is very important, intervention efforts in line with promotion of this behavior in patients is important and necessary. Results of this study showed that self care behavior in Heart failure patients decreases frequency of hospitalization and costs of treatment. Considering the importance of awareness as the most important determinant of self care behavior in patients with Heart failure, educational programs should be planned and directed towards promotion of patient awareness of etiology of disease, correct method of medication treatment and correct performance of self care behaviors.

## Explanation

This manuscript is taken from my MS dissertation completed at Zahedan University of Medical Sciences

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