EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES

http://www.ejbps.com

ISSN 2349-8870
Volume: 4
Issue: 4
XX-XX
Year: 2017

# THE IMPACT OF SELF-CARE ON REDUCTION OF COSTS IN PEOPLE WITH HIGH BLOOD PRESSURE IN CLIENTS OF YASOUJ IMAM SAJAD HOSPITAL HEART WARD IN 2015

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**Article Received on 14/01/2017** **Article Revised on 06/02/2017** **Article Accepted on 27/03/2017**

## ABSTRACT
This study has been conducted with the aim of examining the impact of self-care in reduction of health costs of patients with high blood pressure in clients of Yasouj Imam Sajad Hospital heath ward in 2015. This study is a double- blinded randomized clinical trial. Sampling was performed as all counting and 120 persons were selected in two test and control groups for performing the study and after collecting data, statistical analysis was done by SPSS software. The results showed that in significance level (P<0.05), trainings has considerably increased self-care among the statistical samples from 15 to 34%. Concerning determining direct costs of high blood pressure , the results showed that with performed studies in significance level (P<0.05), direct costs have reduced from 69% to 54%. As to determining indirect costs of high blood pressure, the results showed that by performed trainings in significance level (P<0.05), direct costs have reduced from 29% to 17%. As regards the impact of self-care on reduction of patients with high blood pressure, the Fisher test results showed that this difference is significant in significance level (P<0.05).

**KEYWORDS:** blood pressure, self-care, direct costs, indirect costs and hospital.

## INTRODUCTION
Self-care has been known as one of promoting health behaviors. According to Pender, health promoting behaviors include any kind of measurement which is performed for increasing and maintaining the individual or group health and self-actualization (Abbadzadeh, 2011).

Self-care is a learned self-adjusting performance in human which is based on people ability for performing self-care actions and is defined as a strategy for accordance with life events and tensions and includes special activities by means of which symptoms of illness are mitigated and the patients' health is maintained and promoted (Choobdari, 2014). Self-care causes life quality promotion and also reduces cases of hospitalization (Salar, 2009). Self-care significance is more apparent when the statistics show that 70% of medical cares are unnecessary and 1.3% of short-term medical conditions are improvable without referring to physician. Moreover, self-care reduces many medical costs (Bahrami, 2014). Learning self-care activities could lead the individual towards maintaining health and welfare and increase the individual adaptability with disease, increase the ability of self- care in people and reduce the patients' disability and treatment costs (Rostami, 2013).

High blood pressure is one of general health problems in the world that has involved 6 to 25% of the world adult population and in Iran 26.6 % of people above 15 years old suffers from high blood pressure (Izadi, 2013). Till 2010, about 1.2 milliard persons had suffered high blood pressure and yearly 4 million people die as a direct result of blood pressure (Ghanadi, F, 2014). High blood pressure is one of the most important factors of cardiovascular diseases and the most prevalent reason of heart failure, apoplexy, kidney failure (Bahreinian, 2010). Cardiovascular diseases have designated 60% of total deaths and 46% of diseases load and it is predicted that it allocates about 60% of diseases load and 73% of total mortalities till 2020 ( Ghanadi, 2014). The first reason of death in Iran with 39.3 % of total deaths is due to cardiovascular diseases that about 3.1% of these

deaths are due to high blood pressure and the rest is relating to other cardiovascular diseases (Samavat, 2012). About 50% of patients with chronic diseases like high blood pressure don't observe their regimes and this causes increase of disease load and hospitalization costs and absence from work (Salar, 2009). Blood pressure regulation causes 51% reduction of cardiovascular complications in patients with diabetes and controlling these complications requires patients' empowerment in self-care and this is accessible by utilizing health strategies through selecting correct life methods and health behaviors. The most effective and economical method is developing health bed is responsibility and participation of people in self-care plans. High blood pressure will be controllable if patients have appropriate self-care (Shahbedaghi, 2011).

Studies show that by performing preventive measurements and appropriate self-care behaviors, progress of this disease could be somewhat prevented. Many studies have shown that cares based on self-care in patients with heart failure results in positive results and causes reduction of re-hospitalization. Self-care leads to the patient general health improvement, active participation in care trend, promotion of life quality and finally reduction of treatment costs (Choobdari, 2014).

In economic respect, yearly immense costs are spent in treatment and rehabilitation of people with cardiovascular diseases, while costs of preventing such diseases is much less and based on report of World Health Organization, 41.3% of total mortalities in 2005 in Iran have been due to cardiovascular diseases and it is predicted that till 2020, this rate reaches 44.8% (Siam, 2011). Among factors creating high blood pressure, we can point to smoking, obesity, dietary, alcohol and physical activity that all these are adjustable with self-care behaviors and we can prevent high blood pressure with self-care behaviors, as a result disease costs and cardiovascular diseases load reduce to a great extent (Rafati, 2008). After creation of blood pressure, high blood pressure control is very significant (Barati, 2010). Self-care behaviors in high blood pressure includes regular control of blood pressure, reduction of consumed salt, non-smoking, exercising, avoiding mental pressures, healthy nutrition, weight reduction and regular medicine use. One of factors of high blood pressure self-care actions is regular measuring of blood pressure (Izadi, 2013). Recently, availability of sphygmomanometer home has considerably increased and existence of such devices is potentially economical in respect of reducing costs (Lopez, 2010). Also, self-care training to patients for performing self-care activities and measuring blood pressure at home considerably saves costs (Soghikian, 2006).

Health costs in patients with blood pressure includes direct costs like doctor visit, purchasing medicine, traffic costs and indirect costs such as increasing disability days and absence from work. So, regarding the increasing spread of high blood pressure and self-care significance in these patients and since cardiovascular diseases such as high blood pressure is one of main chronic diseases of societies including our country and Kohkiloyeh & Bouyer Ahmad province due to cultural, social and trophic styles has a high number of patients with this illness and on the other hand, no study has yet been performed in this ground in the province which measures the rate of self-care impact on reduction of these patients health costs and in this study we seek to examine the impact of self-caring behaviors in costs of the mentioned patients.

## METHODOLOGY

The present study is a double-blinded randomized clinical trial which was conducted for examining the impact of self-care on reduction of health costs of patients with high blood pressure in clients of Yasouj Imam Sajad hospital heart ward in 2015. Our statistical population in this study includes all patients with high blood pressure who have referred to Yasouj Imam Sajad hospital heart ward. Sampling is as all-counting of patients with high blood pressure who have referred to Imam Sajad hospital heart ward since 19 February 2015 till the end of June 2016. In this study, during this time interval, 120 people who have referred to Imam Sajad hospital heart ward all were selected as sample. The validity of this study was confirmed nominally by 3 experts of health domain who had required specialism is their field. For evaluating reliability of the research, Cronbach alpha test in SPSS software was used and the results showed that for self-caring behaviors, by assessing direct and indirect medical costs, reliability of 0.84, 0.83 and 0.76 was obtained respectively. The statistical analysis was performed by SPSS 23 software and statistical tests of ANOVA, qui- square and Fisher.

## RESULTS

As to medicinal control, according to table 1, the results have shown that consuming drugs prescribed for blood pressure in the seven past days among test group who has acquired required trainings for self-care from 23% in pretest has reached 33% after training, comparing control group in posttest this difference has been significant in level of $P<0.05$. as to consuming drugs at the appropriate time in the last seven days who have acquired required trainings for self-care, from 18% in pretest, it has reached 25% after training, comparing control group in posttest, this difference has been significant in level $P< 0.05$. concerning complete and correct consumption of medicine in the last seven days, the results showed that by training self-care, frequency percent reached 20% from 13% that this difference comparing control group has been significant in level $P<0.05$.

**Table 1: The status of medicinal control among the studied statistical sample.**

| item | group | frequency (frequency percent) | | significance level |
|---|---|---|---|---|
| | | pretest | posttest | |
| consuming prescribed drugs of blood pressure in seven past days | test | 14(23) | 20(33) | 0.021 |
| | control | 17(28) | 16(26.5) | |
| consuming drugs at appropriate time in the seven past days | test | 11(18) | 15(25) | 0.001 |
| | control | 10(16.5) | 9(15) | |
| complete and correct consumption of drugs in seven past days | test | 18(13.5) | 12(20) | 0.008 |
| | control | 10(16.5) | 9(15) | |

Concerning the status of healthy dietary, according to table 2, the results have shown that using fruits and vegetables among test group who have acquired required training for self-care, from 58% in pretest, has reached 70% after training, comparing control group in posttest, this difference has been significance in level P<0.05. as to consuming processed meat in test group who has obtained required trainings for self-care, it has reached from 47% in pretest to 35% after training, comparing control group in posttest this difference has been significant in level P<0.05. concerning fast foods , the results showed that by self-care trainings frequency percent from 38% has reached 32% that this difference comparing control group has not been significant in level P<0.05. As to adding salt to food during baking, the results showed that with self-care trainings frequency percent has reached from 68% to 58% that this difference comparing control group, has not been significant in level P< 0.05. as to bringing saltshaker at table, the results showed that with self- care trainings ,frequency percent has reached 40% from 25% that this difference has been significant in level P<0.05, comparing control group. Concerning consuming chips and so on the results showed that with self-care trainings, frequency percent has reached 17% from 12% that this difference has been significant in level P<0.05 comparing control group. As to consuming pickle, salty olive and so on, the results showed that with self-care trainings, frequency percent has reached 32 from 33% that this difference has not been significant in level P<0.05 comparing control group.

**Table 2: Status of healthy dietary among studied statistical sample.**

| item | group | frequency (frequency percent) | | significance level |
|---|---|---|---|---|
| | | pretest | posttest | |
| consuming fruits and vegetables | test | 35(58) | 42(70) | 0.041 |
| | control | 30(50) | 35(58) | |
| abstaining consumption of fatty foods | test | 21(35) | 33(55) | 0.000 |
| | control | 13(22) | 10(17) | |
| consuming fried foods | test | 40(68) | 30(50) | 0.002 |
| | control | 32(53) | 30(50) | |
| consuming processed meat | test | 28(47) | 21(35) | 0.02 |
| | control | 24(40) | 25(42) | |
| consuming fast foods | test | 23(38) | 20(32) | 0.056 |
| | control | 20(32) | 22(37) | |
| adding salt to food during baking | test | 41(68) | 35(58) | 0.071 |
| | control | 40(67) | 36(60) | |
| bringing salt on table | test | 24(40) | 15(25) | 0.03 |
| | control | 30(50) | 28(47) | |
| consuming chips and so on | test | 10(17) | 7(12) | 0.041 |
| | control | 6(10) | 7(12) | |
| consuming pickle, salty olive and so on | test | 19(32) | 20(33) | 0.121 |
| | control | 15(25) | 13(22) | |

Concerning physical activity, according to table 3 which shows the role of physical activity for self-care during one week among the studied statistical sample, minimum 30 minutes of physical activity in test group who has acquired required trainings for self-care, it has reached from 20% to 35% after training, that this difference has been significant in level P<0.05 comparing control group in posttest. As regards interest in sports such as swimming, walking and cycling in test group who has acquired required trainings for self-care, from 15% in pretest, it has reached 13% after training, that comparing control group in posttest, and this difference has not been significant in level P < 0.05.

**Table 3: Physical activity status in the studied statistical sample.**

| item | group | frequency (frequency percent) | | significance level |
|---|---|---|---|---|
| | | pretest | posttest | |
| minimum 30 minutes physical activity | test | 12(20) | 21(35) | 0.001 |
| | control | 15(25) | 14(23) | |
| interest in sports like swimming, walking and cycling | test | 9(15) | 8(13) | 0.184 |
| | control | 10(17) | 11(18) | |

Concerning smoking, according to table 4, the results have shown that smoking in test group who have acquired required trainings for self-care has reached 15% after training from 14% in pretest, that comparing control group in posttest this difference has not been significant in level P<0.05. as regards consuming hookah in test group who have acquired required trainings for self-care has reached 17% after training from 20% in pretest, that comparing control group in posttest this difference has not been significant in level P<0.05.

**Table 4: Smoking conditions in studied statistical sample.**

| item | group | frequency (frequency percent) | | significance level |
|---|---|---|---|---|
| | | pretest | posttest | |
| smoking | test | 9(15) | 8(14) | 0.14 |
| | control | 12(20) | 11(18) | |
| using hookah | test | 12(20) | 10(17) | 0.087 |
| | control | 8(13) | 9(15) | |

Concerning modification of baking method, according to table 5, the results have shown that the highest average score has been related to exercising with average 3.6 in test group and the least average has been related to baking method modification in control group with average 1.1. the results have shown that by performed trainings, exercising, non-use of sweet drinks, eating little, non-use of harmful foods, non-use of restaurant foods, replacing healthy foods instead of unhealthy ones and modifying food baking methods, significantly in level P<0.05 has caused improvement of natural weight preservation.

**Table 5: Weight preservation condition in studied statistical sample after training,**

| item | group | average (frequency percent) | significance level |
|---|---|---|---|
| supervising on foodstuff consumption | test | 1.3(62) | 0.41 |
| | control | 2.9(58) | |
| exercising | test | 3.6(72) | 0.01 |
| | control | 1.2(24) | |
| consuming sweet drinks | test | 1.4(28) | 0.010 |
| | control | 3.2(64) | |
| I eat less food in each meal | test | 2.5(50) | 0.064 |
| | control | 3.4(68) | |
| purchasing unhealthy foods like fast foods and sandwich | test | 1.9(38) | 0.001 |
| | control | 3.2(64) | |
| consuming foods I like but are harmful | test | 2.2(44) | 0.02 |
| | control | 3.4(68) | |
| eating restaurant foods | test | 1.8(36) | 0.041 |
| | control | 2.3(46) | |
| replacing health food with unhealthy one | test | 1.2(24) | 0.020 |
| | control | 2.5(50) | |
| modifying baking method | test | 3.4(68) | 0.00 |
| | control | 1.1(22) | |

Comparing the impact of self-care on reduction of costs in patients with high blood pressure referring to Yasouj Imam Sajad Hospital heart ward.

**Table 6: Frequency and expected frequency of self-care impact on reduction of patients costs.**

| costs / self-care | | direct | indirect |
|---|---|---|---|
| medicine consumption | observed frequency | 28 | 14 |
| | expected frequency | 25.2 | 12.4 |
| health dietary | observed frequency | 26 | 12 |
| | expected frequency | 24.7 | 9.8 |
| physical activity | observed frequency | 34 | 21 |
| | expected frequency | 34.6 | 25.4 |
| smoking | observed frequency | 18 | 10 |
| | expected frequency | 9.6 | 9.3 |
| weight reduction | observed frequency | 31 | 12 |
| | expected frequency | 35.5 | 14.5 |

According to the table, concerning drug consumption, qui-square test results showed that direct and indirect costs in the observed frequency have been more than expected frequency. As regards the dietary, the results showed that direct and indirect costs in observed frequency have been more than the expected frequency. As to physical activity, the results showed that the observed frequency has been less than the expected frequency. For smoking, the results showed that the expected frequency is less than the observed frequency and for weight reduction; the results showed that the expected frequency is more than the observed frequency.

For analyzing this hypothesis, qui-square or exact Fisher test is used and the results are presented in table 7.

**Table 7: Analysis of the relation between self-care and reduction of costs with the aid of qui-square or Fisher test.**

| test name | test statistics | significance level |
|---|---|---|
| qui-square | 15.3 | 0.00 |
| Fisher | 17.01 | 0.011 |

a. 33% of the sample has expected frequency less than 5.

According to the table, regarding that 33% of the statistical sample has expected frequency less than 5, Fisher test was used that the results showed that the test statistic is 17.01 and significance level is 0.011, therefore, in significance level of $P<0.05$, the hypothesis is confirmed, that is self-care has had an effective role in reducing treatment costs.

## DISCUSSION AND CONCLUSION

The results have shown that the greatest history of suffering blood pressure has been related to 5 to 10 years´ history (35%) and the least to below one year history (12.5%). This study findings are consistent with the results of Khoshtarash et.al(2009), relating to investigating self-caring behaviors and factors relating to it in patients with heart failure, who showed that 43% of patients with heart diseases had history above 5 years.

For examining self-care status in relation to high blood pressure various parameters were examined which includes medicine consumption, healthy dietary, smoking, physical exercise and weight reduction. Concerning medicine consumption, one-way variance test results indicated its significant impact on self-care. Consuming medicines prescribed for blood pressure after a training course increased from 23% to 33% in patients that this increase rate has been significant in level of $P<0.05$ and we can say that if patients plan for consuming drugs, they could stand in a good situation in respect of self-caring behaviors for reducing blood pressure. As to consuming drugs in appropriate time, the results showed that with training, it has significantly increased from 18 to 25% that in explaining the findings of this study, we can say that on time use of drugs could be effective in reduction of blood pressure. As regards to complete and correct use of drugs, the results showed that with required trainings of self-caring behaviors to patients, it has significantly reached 20% from 13.5%. The results of this study are consistent with findings of Clark et.al ( 2011) showed that 13 sessions of continuous training on patients with blood pressure could be significantly effective in improving their status in respect of treatment.

Appropriate dietary after a training course causes patients to have a required care towards high blood pressure. As to using appropriate dietary for opposing with high blood pressure, the results of this study showed that consuming fruits and vegetables with performed trainings, significantly increased from 58% to 70%, abstaining fatty foods with training from 35% to 55%. Also, consuming fried foods significantly reduced from 68% to 50%, consuming processed meat from 47% to 35%, bringing salt to table from 40% to 25% and using chips and so on from 17% to 12% after training and it haven't had a significant impact on consuming fast foods, adding salt to food and consuming pickle and salty olive despite performed trainings. In explaining the findings obtained from this study, we can say that correct and appropriate training for controlling dietary and using homemade foods and abstaining from fast and salty foods could be effective in reducing blood pressure. Findings of this study are consistent with research of Mahaka et.al (2006) who addressed the relation between awareness from self-care activities of pregnancy blood pressure and controlling blood pressure in them and the results showed that appropriate dietary could be effective in reducing blood pressure.

Concerning the impact of physical activity on self-care of patients with high blood pressure, the results of this study have shown that training the impact of at least 30 minutes physical activity has caused self-care to increase significantly from 20 to 35%, but as to interest in sports of swimming, walking and cycling despite the performed trainings, the results showed that the performed trainings have not been effective about performing these sports on patients self-care. In explaining the findings obtained from this study, we can say that physical activity and sport could be effective in reducing blood pressure and creating succulence and spirit. The results of this study are not consistent with findings of Klier et.al (2011) which showed that walking sport is effective on reduction of pregnant women blood pressure.

As to smoking on self-care behaviors of patients with high blood pressure, the results of this study has shown that despite the performed studies for reduction of smoking and hookah in patients , unfortunately reduction of smokers has not been significantly observed. In explaining the findings of this study, we can say that for reducing blood pressure in patients, it is required that families prevent from smoking and consuming hookah and other opioids since these drugs are effective in increasing blood pressure. Findings of this study are not consistent with results of Nazari et.al (2015) who examined the impact of smoking on blood pressure among men above 40 years old that referred to Zahedan city clinics and findings showed that 45% of people who smoke have higher blood pressure than others.

As regards to preserving the body natural weight, the results have shown that exercising with self-care trainings has caused to increase the interest rate in preserving natural weight from 24% to 72% and modifying food baking method with self- care trainings significantly increased from 22% to 68%. For replacing unhealthy foods with healthy, the results showed that with self-care training, increased from 24% to 50%, consuming restaurant food from 46 to 36%, consuming harmful foods from 68% to 44%, consuming fast foods from 645 to 38% and using sweet drinks from 64% to 28% significantly reduced. As to supervising on consumed foodstuff and reducing meals, the results have not been significant. In explaining the findings of this study, we can point to the role of dietary in adjusting the body's natural and normal state and this, causes to reduce blood pressure and provide the ground of health and wellbeing. The results of this study are consistent with findings of Davoodi et.al (2011) who examined the role of exercise and dietary during a 5 months period on adjusting blood pressure and body weight and the results showed that exercising has the greatest impact on reducing blood pressure and weight.

After required trainings, using qui-square test about dietary, the results have shown that the observed frequency for assessing direct costs is 28% and indirect costs 14% that the expected frequency for assessing direct costs is 25.2% and indirect costs 12.4% which is lower than the observed frequency and therefore, drug consumption has been performed desirably. As to healthy dietary , the observed frequency for assessing direct costs is 26% and indirect costs is 12% and for assessing indirect costs is 24.7% and indirect costs is 9.8% which has been more desirable than expected. About physical activity, the observed frequency for assessing direct costs is 34 persons and indirect costs is 21 persons and for assessing indirect costs 34.6% and for indirect costs is 25.4% that comparing the expected frequency, this frequency rate is not appropriate and has been less than expected. As to smoking, the observed frequency for assessing direct costs is 18% and indirect costs is 10% and for assessing direct costs 9.6% and for indirect costs 9.3% which has been more desirable than expected. As to reducing weight, for assessing direct costs is 31% and indirect costs is 12% and for assessing direct costs 35.5% and for indirect costs 14.5% that comparing expected rates of direct and indirect costs is not proportionate. For comparing the impact of direct and indirect costs on self-care, the results of this study by Fisher test showed that this difference has been significant in level $P<0.05$.

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