

The effects of educational programs and telephone follow-up on the quality of life (QOL) and life satisfaction in patients with acute coronary syndrome in coronary care unit (CCU) and post-CCU

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ABSTRACT

The effects of educational programs and telephone follow-up on the quality of life (QOL) and life satisfaction in patients with acute coronary syndrome in coronary care unit (CCU) and post-CCU

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Acute coronary syndrome is a debilitating and progressive disease, which can affect patient's quality of life (QOL) and life satisfaction, which are two important components of patients' treatment and care. The present study was conducted to determine the effects of educational programs and telephone follow-up on the QOL and life satisfaction in patients with acute coronary syndrome. Ninety patients with acute coronary syndrome were enrolled in a randomized clinical trial. The patients in the study were randomly classified into three groups: Group A (n=30) received educational program, Group B (n=30) received educational program plus ten telephone calls, and Group C (n=30) received no interventions. MacNew's questionnaires of patient's QOL and patient's satisfaction were applied for all the groups. During hospitalization, the patients in Groups A and B received three 30-minute sessions of heart-disease-related educational program together with educational booklets. The patients in Group B received additional ten telephone calls for the consistency of the educational program for two months after patient's discharge. Statistical analysis was performed

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through the analysis of variance and Pearson's correlation test ($p < 0.05$). The results showed that the effects of intervention in Groups A and B on the total score of QOL were not significant compared to the control group. The emotional and physical dimensions of QOL were significantly different between the patients with

intervention and Group C. Comparison between satisfaction means of the three groups before intervention showed no significant difference. However, there was significant difference between them after intervention ($p < 0.001$). There was also a significant difference between satisfaction scores of Groups A and B compared to Group C. However, there was no statistically significant difference between Groups A and B.

INTRODUCTION

The ever-increasing growth of chronic diseases is one of the problems of today's medical society^{1,2} in which cardiovascular diseases have a special position. Throughout the world, the death rate due to cardiovascular diseases is the highest in the Middle East and Eastern Europe. Iran has the maximum percentage compared to other countries in the East³. According to the World Health Organization (WHO), 20% of deaths worldwide and 35% of deaths in Iran are due to cardiovascular diseases, with acute coronary syndrome to be the main cause, and 1.5 million people die annually in the US due to acute coronary syndrome⁴. The WHO announced in 2010 that cardiovascular diseases will be the most prevalent causes of death up to 2020, considering morbidity, mortality, and financial expenses^{5,6}. The discharge of the hospitalized patients with acute coronary syndrome is a stressful event for the patients and their families. One of the reasons is the lack of communication between patients, their families and health care staff, which leads to insufficient information and education regarding their treatment and care.

Patients suffering from heart diseases, especially acute coronary syndrome, are not exempt from these problems. They require information regarding continued treatment, medical prescription, nature of the disease and the factors affecting its occurrence, nutritional diets, daily activities, and continuing treatment after discharge. Studies have shown that there are failures in transferring information to patients and families. Moreover, these patient's problems are more intense during the first weeks after hospital discharge^{7,8}.

Braun et al. showed that patient's quality of life (QOL) decreases six months after myocardial infarction⁷. Schweikert et al. investigated the QOL of 4,570 patients having survived myocardial infarction, and showed that 2,950 (67.1%) of the patients who filled out the EQ-5D Questionnaire through e-mail often had average to intense problems in the dimensions of pain/ailment (55%), anxiety/depression (29.2%), and activity intolerance (27.9%)⁶. Also, Shojaei et al. performed a study on 250 patients with heart diseases, and found that 76.4% of them had undesirable or fairly desir-

able QOL⁹. These problems can cause non-compliance and increase patient's dissatisfaction^{9,10}. To solve these problems, patient and family education, nurse education, heart advisory, and rehabilitation have already been performed at patient's places of residence^{5,11}.

Another solution that can help the continuity of treatment concerning educational programs for the patients with acute coronary syndrome is nurse guide organization after discharge. Organizing nurses as treatment guides after discharge can positively affect a patient's QOL and life satisfaction⁸. Khayam-Nekouei et al. showed that the effects of cognitive-behavioral education on QOL in 66 patients with heart diseases have been statistically significant⁵. Dedoncker et al. evaluated advisory and education for heart rehabilitation performed in 60 patients, and suggested patient's satisfaction after intervention¹¹. Another measure suggested the promotion of treatment results and coordination of education care is through telephone communication with the patients. Telephone and internet communication is being developed by the healthcare staff headed by a physician and a nurse¹². However, contradictory results have already been reported. Khalifehzadeh et al. showed that in 40 patients with cardiovascular disease who needed a pacemaker, the effects of telephone intervention in pacemaker care has significantly increased patient's QOL¹³. There is also evi-

dence that telephone advisory can increase patients' satisfaction after surgical operations¹². However, Sadeghishermeh et al. showed that there was no significant difference considering QOL between telephone and SMS follow-up groups compared to the control group after intervention¹⁴.

The present study was performed to determine educational programs and telephone follow-up by nurses on QOL and life satisfaction among the patients with acute coronary syndrome.

METHODS

After approval of the University's Ethics Committee, ninety patients with acute coronary syndrome were enrolled in a randomized clinical trial. The patients of the study were randomly classified into three groups: Group A (n=30) received educational program, Group B (n=30) received educational program plus ten telephone calls, and Group C (n=30) received no interventions.

In addition to the diagnosis of acute coronary syndrome, the criteria required to enter the study included age limitation to 25-70 years old, hospitalization in CCU and post-CCU wards, written inform, patient's access to telephone, suffering from no hearing or speaking problems, speaking Persian or either Lori or Laki dialects, feeling no pain, willingness to receive educational program, permission to make telephone calls after discharge, willing-

ness to visit the hospital two months after discharge, and not suffering from mental disorders. The exclusion criteria of the study included having no access to the patient after discharge, the patient's unwillingness to continue the study, patient's death, having no more access to the patient, as well as changing the telephone number and not responding the telephone follow-ups.

MacNew's questionnaires of patient's QOL and patient's satisfaction were applied in all the groups. During hospitalization, the patients in Groups A and B received three 30-minute sessions of heart-disease-related educational program together with educational booklets. The patients in Group B received additional ten telephone calls for the consistency of the educational program for two months after patient's discharge.

MacNew's questionnaires were filled out by a nurse before and after the intervention of Groups A and B. Filling out the demographic forms and disease history as well as telephone follow-up and education were also performed by the nurse. MacNew's questionnaire of QOL enjoy proper content, construct, and scale validity¹⁵. This questionnaire has 27 questions evaluating three subscales such as emotional, physical, and social functions of QOL in the patients with heart diseases. Fourteen questions of this questionnaire are on physical function, 14 questions fall in the area of emo-

tional function, and 13 questions cover social function. In the questionnaire, the questions are classified in a way that each question can fit in one, two, or three areas.

This questionnaire is adjusted by Yousofi and Jafari for the patients with heart diseases in the Iranian city of Esfahan, and its reliability is calculated as 0.94 using Cronbach's alpha coefficient. The satisfaction questionnaire specific to the patients with heart diseases also included 25 two-choice (Yes/No) questions about department facilities, patient's familiarity with the department, care, and patient education. Khatiban and Toulabi reported that its internal reliability is confirmed as 0.819 using Cronbach's alpha coefficient^{16,17}. The patients in Groups A and B received an educational program including theoretical education about department facilities, patient's familiarity with the department, care and mental requirements, nature and causes of the heart disease, medicine consumed, treatment process follow-up, nutritional diet and activity, as well as medical diet during three 30-minute sessions while hospitalized, in line with the patient's desired time.

The trainings were conducted separately for each patient as face-to-face in the form of question and answer. Moreover, the companions were also instructed how to take care of their patients. They also received educational booklets containing the required health points

on hospitalization. In addition to education for two months after discharge, Group B received 10 calls in advisory form.

In each telephone call, the patient's questions on the state of disease and treatment follow-up procedure were answered. The researcher asked them some questions on whether they have such symptoms as chest pain, asthma, dizziness, etc. Moreover, she asked them some other questions as follows: What do you do when suffering from chest pain? When do you take your medications? How is your physical activity? What foods do you eat? In case of what symptoms do you visit the physician? If required, the patient was recommended to refer to the hospital. The Group B patients could ask their questions from the researcher through telephone calls at any time of the day. However, some of their questions were answered by consulting the heart specialist.

During the first and second weeks after discharge, two telephone calls per week (at both beginning and end of the week) were made, and during the next six weeks, one call per week was made. Patients in Group B had telephone access to people who performed the study. The patients in the control group received no interventions. However, they were provided with an educational booklet once the study was over and the questionnaires were filled out.

Data are expressed as mean \pm SD. Parametric data were compared between the groups through covariance analysis and Pearson's correlation coefficient tests. Statistical significance was assumed at $p < 0.05$. Moreover, analysis was performed using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago IL).

RESULTS

Demographic data were similar among groups (Table 1). Based on the results, the mean age of the study patients was 54.93 years. Of the total participants, 54.43 % were women, and 95.56% were married. Also, 45.55 % were uneducated, and 30% did not have high school diplomas. Moreover, 43.3% were housewives, and 90% spoke Lori. 50 % of them referred to the physician twice on average after discharge. Furthermore, 74.46 % were hospitalized with their disease diagnosed as chest angina, 35.56% and 15.53% with backgrounds of blood pressure and blood pressure-diabetes, respectively. Meanwhile, 78.97% had medicine consumption background.

Only 23.3% of the Group B members made telephone calls with the researcher. The studied groups were almost homogeneous considering demographic specifications and medical backgrounds. It can be proved that not all the three groups had statistically significant differ-

ences given the deforming variables that can somehow influence the results.

Table 1. Demographic data of the study

| | Group A, n=30 (educational program) | Group B n=30 (educational program plus 10 tel. calls) | Group C n=30 (no interventions) |
|--|--|---|--|
| Age (yr) | 56.1±8.65 | 53.3±10.92 | 55.32±9.5 |
| Gender (m/f) (%) | 14/16 (46.7/53.3) | 13/17 (43.3/56.7) | 14/16 (46.7/53.3) |
| Marital status Married/single (%) | 30/0 (100/0) | 27/3 (90/10) | 29/1 (96.6/3.3) |
| Education Educated/ Uneducated (%) | 16/14 (53.3/46.7) | 20/10 (66.6/33.3) | 17/13 (56.7/43.3) |
| Dialect Lor/Lak (%) | 27/3 (90/10) | 27/3 (90/10) | 29/1 (96.6/3.3) |
| Occupation Employed /Unemployed (%) | 30/0 (100/0) | 29/1 (96.6/3.3) | 28/2 (93.3/6.6) |
| Number of referrals to physician after discharge: (%) | 1-5: 30/0 (100/0) | 1-5: 27 (90) 5-10: 2 (6.6) >10: 1 (3.3) | 1-5: 30/0 (100/0) |
| Type of cardiac disease Unstable angina/ Myocardial infarction (%) | 26/4 (86.7/13.3) | 21/9 (70/30) | 20/10 (66.6/33.3) |
| Number of patient's receiving medication Yes/No (%) | 24/6(80/20) | 26/4(86/13.3) | 21/9(70/30) |

Covariance test showed that intervention has no significant effect on the total score of QOL

($p=0.380$). Prior to intervention, there was also no significant difference between the total score of QOL and its dimensions between groups. According to Tukey's post-hoc test, QOL in Group A has no significant difference with Groups B and C regarding emotional dimension. However, Group B had a significant difference compared to Group C (Table 2).

Table 2. Comparison of QOL emotional dimension after intervention between groups.

| GROUP | 95% Confidence Interval for Difference | | P | SD | Mean Difference |
|---------------|---|------------------------|----------|-----------|----------------------------|
| | Lower Bound | Upper Bound | | | |
| B vs A | 0.318 | -8.705 | 0.068 | 2.269 | - 4.193 |
| C vs A | 8.108 | -0.924 | 0.117 | 2.272 | 3.592 |
| A vs B | 8.705 | -0.318 | 0.068 | 2.269 | 4.193 |
| C vs B | 12.29 | 3.273 | 0.001 | 2.270 | 7.785(*) |
| A vs C | 0.924 | -8.108 | 0.117 | 2.272 | -3.592 |
| B vs C | -3.273 | -12.29 | 0.001 | 2.270 | -7.785(*) |

* $p < 0.05$

Statistical analysis also showed that there is no significant difference between the physical dimensions in Group A compared to Groups B and C. However, Group B was significantly different from Group C (Table 3).

Studies on the effects of demographic variables on QOL and intervention showed that none of them has significantly affected QOL (Table 4).

Table 3. Comparison of QOL physical dimension after intervention between groups.

| GROUP | 95% Confidence Interval for Difference | | P | SD | Mean Difference |
|--------|--|-------------|-------|------|-----------------|
| | Lower Bound | Upper Bound | | | |
| B vs A | -0.614 | -10.47 | 0.028 | 2.48 | -5.545(*) |
| C vs A | 6.620 | -3.240 | 0.497 | 2.48 | 1.690 |
| A vs B | 10.475 | 0.614 | 0.028 | 2.48 | 5.545(*) |
| C vs B | 12.175 | 2.295 | 0.005 | 2.48 | 7.235(*) |
| A vs C | 3.240 | -6.620 | 0.497 | 2.48 | -1.690 |
| B vs C | -2.295 | -12.17 | 0.005 | 2.48 | -7.235(*) |

* $p < 0.05$

Covariance analysis test showed that the only demographic variable affecting the social dimension of QOL in all patients is the number of referrals to the physician, where social dimension has increased with increase in the number of visits. Moreover, covariance analysis of physical and social dimensions showed that demographic variables have not significantly influenced them in all patients.

To investigate which groups had significant differences, Tukey's post-hoc test was used. Results showed that there is significant difference between Groups A and C as well as between Groups B and C. However, there was no significant difference between Groups A and B (Table 5).

Table 4. Results of demographic variables on the QOL of the patients with acute coronary syndrome

| Demographic | Sum of Squares | F-amount | P | Multiplier Effect |
|-----------------------|----------------|----------|-------|-------------------|
| Sex | 1188.3 | 0.828 | 0.366 | 0.04 |
| Age | 2817.0 | 1.96 | 0.165 | 0.02 |
| Occupation | 2064.4 | 1.43 | 0.234 | 0.019 |
| Marital status | 2252.6 | 1.57 | 0.214 | 0.02 |
| Training | 240.56 | 0.168 | 0.683 | 0.02 |
| Language | 436.30 | 0.30 | 0.583 | 0.09 |
| Referral to physician | 1086.0 | 0.757 | 0.78 | 0.01 |
| Diagnosis | 106.01 | 0.074 | 0.786 | 0.01 |
| Associated disease | 7.78 | 0.005 | 0.941 | 0.000 |
| Patient's medication | 377.48 | 0.263 | 0.60 | 0.03 |
| Intervention | 5533. | 0.92 | 0.15 | 0.04 |

Mean satisfaction after intervention is also different for all three groups; it is more in the telephone follow-up group than the education and control groups. Also, it is more in the education group compared to the control group.

Pearson's correlation coefficient between QOL and its dimensions and satisfaction in the studied groups showed that there is significant difference only in the physical dimension with a coefficient of 0.43. Therefore, satisfaction has increased with increase in QOL in the physical dimension ($p < 0.05$).

Table 5. Comparison between satisfaction levels in patients with acute coronary

| GROUP | 95% Confidence Interval for Difference | | P | SD | Mean Difference |
|--------|--|-------------|---|------|-----------------|
| | Lower Bound | Upper Bound | | | |
| B vs A | 2.984 | -3.059 | 1 | 1.26 | -0.037 |
| C vs A | 10.23 | 4.298 | 0 | 1.24 | 7.26(*) |
| A vs B | 3.059 | -2.984 | 1 | 1.2 | 0.03 |
| C vs B | 10.27 | 4.335 | 0 | 1.2 | 7.30(*) |
| A vs C | -4.29 | -10.23 | 0 | 1.24 | -7.26(*) |
| B vs C | -4.33 | -10.27 | 0 | 1.2 | -7.30(*) |

* p<0.05

DISCUSSION

The results showed that since the studied groups are homogeneous due to random classification of the patients, significant difference in physical and emotional dimensions of QOL can be attributed to intervention. In Group C, these differences were not tangible as compared to Groups A and B. Comparison between both compared groups considering satisfaction indicated that satisfaction was more in Group A than in Group C and more in Group B than Group A. Moreover, there was significant difference between the three groups' scores after intervention. Different studies have been conducted to investigate and pro-

mote QOL and satisfaction in the patients with heart diseases.

Khayam-Nekouei et al. showed that the effects of cognitive-behavioral education on the three subscales and total score of QOL are significant⁵, which corresponds with the present research in physical and emotional dimensions. Dedoncker et al. studied 50 patients with heart disease to evaluate long-term effects of telephone educational counseling by the nurse on satisfaction and self-care. It was noted that patients' satisfaction was assessed four years later in this study. The results showed that 82% of the patients replied, and 90% believed that their counseling helped them improve their lifestyle¹¹.

Shojaei et al. investigated the effects of patient education and telephone follow-up by the nurse in the patients with heart failure, showing that there is significant difference between levels of hope in all three groups ($p < 0.004$). It means that patient education and telephone follow-up after discharge by the nurse significantly increases hope in the patients with heart failure². Also, Tofighian et al. investigated the effects of individual counseling on the QOL of the patients with myocardial infarction in both control and intervention groups in a semi-empirical form within four one-hour counseling sessions performed every other day in three social, physical, and mental fields. The results showed that despite difference in all

dimensions of QOL, this difference has been significant only in the mental health dimension. The total scores of the control and intervention groups after counseling did not have statistically significant difference, which is consistent with the present research¹⁸. These results may be due to the short period of the study. Thus, it is suggested that further studies be performed in longer periods together with multi-field care. Besides interventions like education, heart rehabilitation, and counseling, today's studies have been conducted regarding the effects of telephone follow-up on patients' QOL.

In a systematic review study by Kotb et al. to provide the patients suffering from heart diseases with supportive intervention, results showed that in all 26 studies selected based on the criteria for entering the research, there was no difference in mortality rate between the telephone and control groups¹⁹. However, in the study of Holtrop et al., conducted to investigate hospital telephone guidance by the nurse after discharge of the patients with acute coronary syndrome, results indicated that the intervention group patients reported better physical activity and fewer visits during the first three months. There was no significant difference between the eighth and third months in the one-year study in relation to giving up smoking and consuming medicine, and the QOL of patients was not statistically different either in

the eighth month after intervention. Therefore, the authors stated that guidance by the nurse after hospitalization is effective in two weeks for the patients with acute coronary syndrome, but it was not confirmed for long-term studies²⁰. Telephone counseling intervention may not be effective, because in the hospitals where intervention has been performed, there have been proper organized programs for discharge and education. However, in the treatment center where the present study was performed, although there was a routine educational program, there was not telephone follow-up. Therefore, increases in patients' satisfaction and QOL in physical and emotional dimensions have followed.

However, in Sadeghishermeh et al.'s study, performed on 90 patients in the three groups of control, SMS and telephone call, to investigate the effects of telephone follow-up and SMS on the QOL of the patients with heart diseases after valve replacement surgery, results showed that there was no significant difference between telephone follow-up and SMS after intervention¹⁴. In this study, two communication systems have been compared to each other. However, in the current study, only one communication system was used after discharge. Results of both studies suggested that telephone communication does not affect the total score of QOL. Nevertheless, in Khalifehzadeh et al. study, conducted to investi-

gate the effects of telephone follow-up on different fields of QOL in the patients with heart pacemakers in two 20-patient control and education groups, showed that the difference between QOL of both groups is significant¹³, contrary to the present study.

Generally, different studies showed different results. However, in this study, we demonstrated the effect of educational program and telephone follow-up interventions as effective factors on life satisfaction and QOL in the patients with acute coronary syndrome, which could act as a connective line for reporting patients' conditions to the nurse. In other words, these interventions can help the nurse decide to assist the process of recovery and rehabilitation of patients. Since full-time access to guide nurse can create relaxation and confidence in patients, we suggest that in addition to launching the nurse help line, other studies on different groups of patients be conducted with a larger sample size and longer period.

There were some problems and limitations in this study. For instance, some patients did not pose all their problems. Some phone numbers belonged to the patient's family members, making the nurse-patient connection difficult and time-consuming. Moreover, some patients had not enough cooperation with the researchers for filling out the questionnaire again after two months, which led to more time-consumption.

CONCLUSION

Telephone follow-up, using guidance by the nurse, could increase satisfaction and QOL in physical and emotional dimensions in the patients with acute coronary syndrome. It is suggested that more studies be performed with larger samples and longer follow-up periods. Further studies on the effects of using other communication media such as the Internet and SMS on mortality rate, self-care, and number of visits are also recommended.

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Author Disclosures:

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