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Impact of Tele-nursing on adherence to treatment plan in discharged patients after coronary artery bypass graft surgery: A quasi-experimental study in Iran

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ABSTRACT

Background and aims: Coronary artery bypass graft is a major surgery and has complications that require professional and long term follow-up and nursing care that if do not properly handled, could reduce the quality of life and increase post-operative complications. On the other hand Tele-nursing is a cost-effective way to educate and follow-up of patients. This study aimed to assess the impact of Tele-nursing on adherence to treatment plan in discharged patients after coronary artery bypass graft.
Materials and methods: A quasi-experimental study was carried out at Ekbatan Therapeutic and Educational Center of Hamadan University of Medical Sciences at Hamadan, Iran, in 2013. In this study, 71 patients who had undergone coronary artery bypass graft surgery and had inclusion criteria were randomly divided into two experimental group ($n = 36$), and control group ($n = 35$). They completed questionnaire before discharging from Therapeutic and Educational Center. In the experimental group on days 2, 4, 7, second week (day 11), third week (day 18) and fourth week (day 25) after discharge, follow-up interventions and nursing education with Tele-nursing was done, but in the in the control groups, patients received only routine interventions. After completion of the intervention period, both groups completed the questionnaire and the results were compared.
Results: Adherence of treatment plan in both groups did not have significant difference before intervention ($P = 0.696$), but had a significant difference with regard to baseline after intervention in aromatherapy group ($P < 0.01$) and with control group after intervention ($P < 0.01$). Adherence to treatment plan in the aromatherapy group was better in compared to control group ($P < 0.01$).
Conclusion: Tele-nursing is a convenient way, cost effective training and follow-up care for patients after coronary artery bypass surgery, which can improve patients' adherence to treatment plan in developing countries such as Iran.

1. Introduction

Coronary artery disease is reported as the sixth leading cause of death in America, so that every 25 s a coronary acute attack occurs [1]. However, the rate of high-invasive heart surgery has declined in America [2], but the rate of this surgery continues to increase in Iran. Of the 25,000 open heart surgeries performed annually, about 60% are coronary artery bypass graft (CABG) surgery [3]. In America, about 90% of the budget of the healthcare system is spent on the treatment and complications of diseases which are mostly preventable [4]. Both the disease prevention and adherence to the treatment plan is essential in order to decrease of burden of diseases. Nevertheless, the lack of adherence to treatment was reported 20–40% in acute diseases, 20–60% in chronic diseases and in preventive regimens 50–80% [5]. In America, about 125,000 deaths are reported annually in relation to the lack of appropriate use of medications [6]. Moreover, between 100 and 300 billion dollars are directly and indirectly spent per year due to not taking medications [7].

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Although most studies on the adherence to the treatment plan have focused on taking medications, adherence to the treatment plan encompasses all health-related behaviors recommended by health care providers. Furthermore, the result of the treatment has a direct relationship with the patient's adherence to treatment plan. Adherence to treatment in chronic diseases is important due to the need for specific training for rehabilitation, control and monitoring, observation and long-term care. Adherence to the treatment plan of medications and diet, avoidance of risk factors, and adherence to the physical activity plan is based on the type of disease and special conditions of care for each person [8]. After heart surgery, patients receive various medications with side effects and special care and instructions [9]. After being discharged from the hospital, the patients and their families develop fears and concerns, and have many questions. In fact, patients and their families are responsible for their own care at home after hospital discharge [10]. Many problems at home are due to lack of knowledge and skills in the fields of health care, nutrition, medication use, and follow-up of treatment plans. Lack of training and counseling for the patients and lack of access to the required education and healthcare centers increase their problems.

In the twenty-first century, the rapid changes in the delivery of healthcare in the health system, and the requirements of the society have caused the questioning of the appropriate preparation of the health system and professional medical staff in overcoming these problems. Moreover, health care is becoming more complex in the light of aging societies and facing with using technologic advances such as e-Health, Tele-medicine and Tele-nursing [11]. "There have been dramatic increases in the scale of e-Health studies in social sciences over the past decades in terms of the numbers of publications, journal outlets and participating disciplines" [12]. The amount of on-line health-related using smart phone or tablet and so on has consistently increased [13]. In spite of advances in more user-friendly Tele-medicine and Tele-nursing, the general population experiences many skill-related problems with smarts phone, tablets and laptop or computers for internet online health information [14,15] which will be more and sever for general population in developing countries such Iran. However, ability to effectively use and communicate is required more as well. Financial and human resources constraints in the health system have manifested the need to providing more affordable and practical solutions to health care. Anticipating costs for planning health services according to budget constraints and prioritizing health services seems necessary for the health system.

Today, the use of Tele-nursing in providing care and therapeutic services has significantly improved the quality of care. Tele-nursing is conducted by providing education, counseling, follow-up, and nursing care from a distance using telecommunication technologies, such as phone, video phones (short video films, video conferencing), and the internet [16]. Tele-nursing provides training, monitoring, data collection, monitoring care and protection of patients and their family without time and place restrictions [17].

Tele-nursing improves the quality of life of the patients and saves their time by strengthening and continuing access to treatment, care, counseling, and support needs, and necessary information. In addition, due to the lack of need to attend training and health centers, it decreases the number of referrals and the treatment costs [10]. Tele-nursing helps patients and their families actively care or the patient at home and adhere to the treatment plan prescribed with greater knowledge, awareness, and confidence [18]. In Iran, due to the unusual and myths of probability of self-therapy, Tele-nursing has not been used or its use has been limited. However, Tele-nursing has been effectively used for the improvement of the outcome of asthma, myocardial infarction, backache, chronic obstructive pulmonary diseases, diabetes, cancer, heart disease, and Parkinson's and Alzheimer's diseases in the world.

In developing countries, such as Iran, considering the low index of internet use, compared to the use of mobile phones, Tele-nursing has a more appropriate use. Furthermore, Tele-nursing can obtain higher popularity and acceptance due to the use of the mobile phone as a means of mass communication available to the public and can also be more cost-effective. Landline and mobile phone use in daily life is accompanied with relatively new innovation in care services [19], and indicates the relative satisfaction of patients with receiving medical care, treatment plan, and counseling through mobile phone [20].

Due to the growing cost of healthcare and the importance of long-term follow-up care of patients after heart surgery, the healthcare system should seek to provide healthcare services with lower expenses and higher accessibility for patients. This study aimed to assess the effect of Tele-nursing on adherence to treatment plans in discharged patients after CABG surgery.

2. Methods

A quasi-experimental study was carried out using convenience sampling. The study subjects consisted of 71 patients who were discharged after CABG surgery from Ekbatan Therapeutic and Educational Center in Hamadan, Iran, during June 2013. Sample size was calculated as 76 people with type I error of 5% and power of 80% [21], and considering sample loss as 38 subjects in each group. After obtaining written informed consents, patients eligible for entering the study were assigned to two groups of intervention and control using lottery (35 people). In the intervention group, 2 patients due to hospital readmission (36 people), and in the control group, 2 patients due to the same reason and 1 due to lack of interest (36 people) to continue the study were excluded.

2.1. Questionnaire development

The self-reported questionnaire was designed based on the condition of patients after cardiac surgery, standardized educational booklets and some parts of the instrument was adopted from the works of Reynolds et al. [22] (ACTG questionnaire) and Goff and Kreyenbuhl [23] (DAI-30 questionnaire) focused on adherence to treatment, medication and diet plan. The self-reported questionnaire comprised four sections and a short demographic part six statements, which together included a total of 81 statements: 30 about adherence to the medication plan, 29 related to care plan, ten considering diet plan, ten about physical and sport activities plan and two statement about spirometry and chest surgical belt. The statements were scored on a "yes" and "no" scale (medication plan), and the rest were scored on a Likert scale ranging from "never" to "always". "Never" is assigned to the score of 1 and "always" to the score of 5.

The scores for each statement were summed up, and mean values were used. All statements were assumed to have the same weight. The mean of adherence to the medication plan was interpreted between 0 and 30 according to 0–60 weak, 7–14 moderate, 15–21 good and 22–30 excelent. The mean adherence to care plan was interpreted between 29 and 145 according to 29–58 weak, 59–87 moderate, 88–116 good and 117–145 excellent. The mean adherence to the diet plan and physical and sport activities plan was interpreted between 10–41 according to 10–20 weak, 21–30 moderate, 31–40 good and 41–50 excellent. Moreover, the mean of total adherence was interpreted between 19 and 275 according to 19–83 weak, 84–147 moderate, 148–211 good and 212–275 excellent.