# EDUCATIONAL PROGRAM TO IMPROVE HEALTH INDICES AMONG ADULT PATIENTS WITH MYOCARDIAL INFARCTION: EVIDENCE-BASED NURSING

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ABSTRACT

Myocardial infarction is the leading cause of illness and death for people in Bangladesh and many other countries in the world. This study aimed to summarize all related evidence in regard to educational programs to improve health indices among adult patients with myocardial infarction and make a conclusion based on recommendations from the evidence. The related evidence published from 2009-2014 in English language were searched from Mahidol University electronic databases. Searching of evidence was conducted by using the PICO (Population Intervention Comparison Outcome) framework. Seven randomized control trials, two quasi-experimental studies, and one systematic review were included in the study. Educational programs frequently were delivered in hospitals. The programs were group and individual programs administered by nurses and other multidisciplinary teams. Common contents consisted of information about the disease, signs and symptoms, impact of myocardial infarction, healthy diet, physical exercise, importance of stopping smoking etc. Findings from the evidence support that educational programs are effective among adult patients with myocardial infarction to improve health indices.

It is recommended that an educational program to improve health indices among adult patient with myocardial infarction to suit the clinical practice context in Bangladesh should be implemented. Further research to evaluate the effectiveness of educational programs is also recommended.

KEY WORDS: MYOCARDIAL INFARCTION/ EDUCATIONAL PROGRAM/ HEATH INDICES/ EVIDENCE-BASED NURSING

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# CHAPTER I
# INTRODUCTION

## 1.1 Background and significance of the study

Myocardial infarction is an escalating health problem contributing to high morbidity and mortality rates in every region of the world. It is a condition of irreversible necrosis of the myocardial tissue caused by critical imbalance between oxygen supply and the demands of the myocardium (Srivastav, Siddique, Mahmood, & Ahsan, 2013). It also refers to the death of myocardial cells, which without prompt treatment, can damage the affected part of the heart (Asgar, Chinnawong, Kritpracha, & Petpichetchian, 2010). Patients with myocardial infarction could develop many complications such as recurrent acute myocardial infarction, cardiac arrhythmia, cardiogenic shock, chronic heart failure and stroke (Zuckerman et al., 2012).

Globally, approximately 6.3 million people suffered from myocardial infarction, and up to 25% of these patients died from myocardial infarction each year (Fox, 2000). In the United States, nearly 1 million patients suffer from myocardial infarction each year with an ongoing rise in the aging population. Older adults are at high risk for poor outcomes, require longer hospitalization and have higher rates of recurrent infarction compared with the patients in other age groups (Takii et al., 2010). Other evidence has stated that approximately 785,000 people suffer new myocardial infarction each year and approximately 470,000 have recurrent myocardial infarction (Wrenn, Mostofsky, Tofler, Muller, & Mittleman, 2013).

Myocardial infarction accounts for approximately 3 million deaths per year as one of the major causes of death in the Asia/Pacific region according to WHO (2008). Over the past 30 years in Japan (1976-2008), myocardial infarction incidence (100,000 person/year) increased from 7.4% in 1979 to 27.0% in 2008 and hospital mortality rates decreased from 20.0% in 1979 to 7.8% in 2008. Over last 10 years, the Japanese management policy for myocardial infarction has improved with increased primary percutaneous coronary intervention (PCI) from 20% in 1999 to 80% in 2008.

However, hospital mortality rates are higher in females than males at 12.2% and 6.3%, respectively, in 2008. Characterized by female patients with higher age and lower PCI rates, myocardial infarction has prompted the investigator to indicate the urgent need for new effective policy to improve evidence-based management for post myocardial infarction (Takii et al., 2010).

In India, the incidence of myocardial infarction has gradually increased and become the most significant cause of death and disability among the Indian population. The incidence of myocardial infarction in Indians is approximately 8-10% in urban areas and 3-4% in rural areas (Alexander, Mehta, Mullasari, & Nallamothu, 2011). According to the statistics obtained from CREATE, the rate of ST-elevation myocardial infarction (STEMI), a life threatening medical emergency caused by a rapid, occlusive thrombus in the coronary artery, has comparatively elevated (Alexander et al., 2011). Among the more than 20,000 patients enrolled in CREATE, over 60% had STEMI. This amount was significantly higher than in North American patients. Most of the patients were younger and shared lower socio economic status. Approximately 60% received fibrinolytic therapy and only 8% underwent percutaneous coronary interventions (PCI) during hospitalization. Effectively handling this problem requires proper measurement, financial mechanisms, referral systems, communication among stakeholders and continuous monitoring systems to assure the effectiveness of public education (Alexander et al., 2011).

In Bangladesh, myocardial infarction is a major health problem and cause of premature death among people in the middle age group, which is a group that contributes to the national income (Asgar 2010). The incidence of myocardial infarction is also rising in Bangladesh where rates of cardiovascular disease have risen seriously in low-income and middle-income populations. According to the a study of Rahsid and colleguagus (2005) observation from field work with cardiologists, the impact of extended risk of myocardial infarction, particularly in the northern area of Bangladesh, are highlighted. Patients with myocardial infarction should be advised about the modifiable risk factors to adjust people’s behaviours and lifestyle to ensure that they are able to avoid additional urgent situations caused by myocardial infarction (Rahsid, Islam, & Islam, 2005). Clearly, evidence from many countries including

Bangladesh indicated that the numbers of patients with myocardial infarction have been rising. Thus, quality of care for this group of patients needs to be improved.

**Pathophysiology of myocardial infarction:** Early progression of fatty tissues present as coronary artery disease, angina pectoris, plaque disruption and thrombus structure development into higher atherosclerotic lesions. Disruption and rupture are recurrently non-obstructive of the fibrous cap caused by a huge lipid-rich core and elevated macrophage content. When plaque ruptures as a result of exposure of the lipid core, the result is platelet adhesion and aggregation with activation of the coagulation flow and structure of a platelet-rich thrombus (McCann, & Menown, 2008). During complete thrombus formation coronary artery occlusion can develop and lead to myocardial perfusion. Next, symptoms such as shortness of breath, chest pain and profuse perspiration can occur. Then rupture occasionally occurs and originates in the coronary occlusion where the growing the thrombus and occluding the vessels reduce blood flow in the artery and result in reduced oxygen delivery to the myocardium. A confident significant stage for maintaining myocardial cell feasibility, infarction occurs followed by myocardial cell necrosis within fifteen minutes (Werf et al., 2003). When cardiac function is disrupted as characterised by decreased cardiac output, low blood pressure and tachycardia or bradycardia occur due to pulmonary congestion. As a result, coronary perfusion exacerbates ischemia or injury through the development of vasodilatation which can occur in large inferior infarction with subsequent myocardial necrosis. Without treatment within 4-6 hours, further infarction develops with cardiac arrest and death (McCann, & Menown, 2008; Skyschally, Schulz, & Heusch, 2008; Werf et al., 2003).

Myocardial infarction diagnosis is based on the history in which electrocardiograpic readings are particularly valuable when ST- segment elevation, T-wave inversion or reversible depression is revealed. Several patients with acute ischemic syndromes fail to display these results in the early hours of the attack. Then during the early hours after presenting symptoms, tests for cardiac enzymes such as CK-MB isoenzymes or creatine kinase (CK) are linked and insufficiently symptomatic to be assessed in making the essential decision concerning advance management (Malik, Raja, & Mahmood, 2005).

**Risk factors related to recurrent myocardial infarction:** Myocardial infarction is a fatal manifestation of coronary heart disease potentially leading to sudden death and two types of modifiable and non-modifiable risk factors including age, male gender, family history of myocardial infarction, pick up serum total cholesterol and LDL-cholesterol, decreased serum HDL-cholesterol, smoking and diabetes mellitus, unhealthy diet, excessive alcohol intake, high blood pressure, obesity, sedimentary lifestyle and physical inactivity all of which are connected with early myocardial infarction (Khan, & Hoque, 2009). A number of factors increase a patient's risk for recurrent myocardial infarction (Ahmed, Youssif, Ayaserh, & Mawajdeh, 2013; Khan, & Hoque, 2009). Myocardial infarction is greatly increases the risk for reinfarction or death. In the absence of treatment, myocardial infarction patients have a 10% risk for advanced occurrence during the first year after the first myocardial infarction (Edmond et al., 2007).

**Health indices related to myocardial infarction:** Health indices are basically numeric measures of health and well-being. In summary, health indices are measures designed to describe particular health aspects (Webster, & Denise, 2012). The World Health Organization has encouraged its member countries to develop health indices as indicators to reflect the success of treatment outcomes. Different groups of diseases require different health indices to indicate sensitive outcomes (Panagiotakos et al., 2008). In patients with myocardial infarction, health indices include serum lipid profile (cholesterol, triglycerides, HDL cholesterol and LDL cholesterol), hypertension, body mass index, smoking, physical activity and diet (Shahamfar et al., 2010).

A low serum HDL cholesterol level is, therefore, thought to be an independent cardiovascular risk factor leading to the development of atherosclerosis and related recurrent events. The consequences of hyperlipidemia, especially hypercholesterolemia, lead to myocardial infarction. Lipid profiles depend on high fat, high calorie diets, physical inactivity and tobacco smoking, all of which play major roles in the causes and risk of further attacks (Kumar, Anwar, Mahendran, & Kalaivanam, 2013).

Blood pressure is one of the major health indices in patients with myocardial infarction. People with high systolic and diastolic blood pressure increase the risk of recurrent attack in post myocardial infarction. Following myocardial infarction, blood pressure requires strict control. Evidence supports that blood pressure control depends on lifestyle modification and antihypertensive drugs. Lifestyle modifications should emphasize on exercise, weight control and low salt intake (Shah et al., 2011)

One health index that is a factor significantly related to myocardial infarction is smoking. People who smoke represent a percentage of 71.2% patients with myocardial infarction. The path physiological effects of smoking are multifactorial and affect the systemic vascular blood flow as well as the arterial walls. More specifically, smoking is linked with high levels of fibrinogen resulting in an enlarged tendency for thrombosis of the blood and coronary artery disease. High hematocrit levels with an improved risk of platelet agglutination and with reduced HDL levels are also related to smoking (Marvaki et al., 2007). After heart attacks, patients who continue to smoke are at higher risk for death than patients who quit smoking, which is supportive of long-term diagnosis in patients with myocardial infarction (Argyrioul et al., 2011).

Another health indices is body mass index (BMI). Overweight and obesity are traditionally characterized by a body mass index of 25 $kg/m^2$ and 30 $kg/m^2$, respectively. Body mass index is strongly correlated with total body fat and total subcutaneous adipose tissue. Obesity is also recognized as a strong risk factor for the development of myocardial infarction. Obesity, which also includes hypertension, dyslipidaemia, insulin resistance and systemic inflammation, causes a clustering of these risk factors. Moreover, obesity may be associated with cardiac hypertrophy and potentially impair coronary flow reserve, thereby increasing the likelihood of myocardial ischemia (Wolk, Berger, Lennon, Brilakis, & Somers, 2008).

As previously stated, a number of health indices are based on diet. Globally, it has been shown that consumption of fruits, vegetables and alcohol together with some scientific and psychological characteristics explain the risks for recurrent myocardial infarction (Panagiotakos et al., 2008). Healthy nutrition

combines with physical activity exercise and a Mediterranean diet to help in the positive prognosis of patients with myocardial infarction (Argyrioul et al., 2011).

It can be concluded that patients with myocardial infarction need to improve health indices. Fortunately, most of the risk factors for myocardial infarction can be diminished by personal health behaviors. Physical inactivity increases people's weight while increased consumption of narcotics, occupational and mental stress lead to increasing rates of heart disease and mortality. Hence, the aforementioned require the attention and recommendations of health personnel. If patients survive initial attacks, subsequent difficulty may occur with increased chance for subsequently fatal attacks (Vardanjani et al., 2013). Therefore, an effective intervention such as providing an educational program to improve health indices of patients with myocardial infarction is needed.

**Impact of myocardial infarction:** Myocardial infarction has been reported to place an extensive burden on persons by influencing physical as well as psychological, social, economical and realistic aspects of life (Norekval et al., 2007). Myocardial infarction not only kills patients, but represents a huge burden on the health care system with significant impact on human health as a matter of great concern to society in our countries.

**1) Physical impact:** Myocardial infarction impacts patients by loss of ability to perform the activities of daily living (ADL) and low self confidence as patients suffer the life long effects of chronic disease. Continued stress after myocardial infarction reduces the possibility of patients returning to work, while increasing mortality rates (Asgar et al., 2010). Impacts on the healing procedure caused by low health-related quality of life include decreased compliance with treatments, decreased power for ADL performance and risks for complications and death (Hawkes et al., 2013).

**2) Psychological impact:** Myocardial infarction is one of the most stressful life events for many individuals. Stress may increase blood pressure, heart rate, muscle tone and alertness as breathing becomes deeper and more rapid (Asgar, Chinnawong, Kritpracha, & Petpichetchian, 2012). After myocardial infarction, patients suffer severe depressive symptoms, then develop recurrent attacks and severe

life events that increase the risk of suicide (Larsen, Christensen, Sondergaard, & Vestergaard, 2013). Myocardial infarction is associated with a high level of anxiety, fear of impending death and deep frustration resulting from sudden and serious changes in functioning marked by impaired concentration, impaired memory, impaired ability of logical thinking and somatic changes (Mierzynska, Kowalska, Stepnowska, Ryszard, & Piotrowicz, 2010).

**3) Economic impact:** In the United States over $500 billion is spent in direct and indirect financial health care costs associated with myocardial infarction (Desai, & Choudhry, 2013). The burden of myocardial infarction remains excessively represented in low and middle income countries. In Bangladesh, approximately 80% of health burdens occur in myocardial infarction (Rahsid, Islam, & Islam, 2005).

**4) Family impact:** Patients with myocardial infarction increase the burden of the family caregivers taking care of these patients and pose a serious economic threat. If the patient is a main source of family income, the lengthened hospitalization can cause loss of family income and financial status.

**5) Hospital impact:** The most significant effects are caused by hospital burdens such as increased length of hospital stay and bed occupancy, increased workload, increased hospital mortality rates and higher re-admission rates.

**6) Social impact:** Post-myocardial infarction patients may also show a tendency toward social withdrawal, limited participation in social activities and a low level of social anchoring (Mierzynska et al., 2010). Myocardial infarction has psychological and legal implications for both individuals and society.

Rationally, myocardial infarction is a major health problem in Bangladesh which should be controlled or minimized by following intervention.

**Education programs related to myocardial infarction**: Most adult patients suffering from myocardial infarction in Bangladesh have little educational background and insufficient knowledge about self-care for the duration of illness. Myocardial infarction can be controlled or treated by treatment procedures and medication but can also improve health indices (Petersson, Schlyter, Engstrom, Tyden, & Hedblad, 2011). However, several studies indicate that improving health indices not only prevents but also controls the progress of cardiac diseases and reduces the

occurrence of cardiac events in patients with myocardial infarction. The Heart Association/American College of Cardiology 2007 strategy for post-MI secondary prevention highlights three divided components of optimal risk decreases for advanced cardiac actions: (1) management of heart disease risk factors, including blood pressure, LDL cholesterol, and diabetes mellitus within optional parameters; (2) adoption of healthy behaviors such as a heart-healthy diet and tobacco cessation and (3) utilization of specific evidence-based medications proven to decrease events (Shah et al., 2011). Improving heart health indices can prevent such problems by reducing body weight, maintaining lipid profile, quitting smoking and improving lifestyle. In contrast, elevated serum cholesterol, reduction of physical activity, increased body weight, increased consumption of narcotics and smoking can increase the rate of recurrent myocardial infarction. These factors depend on educational background (Shahamfar et al., 2010).

In Bangladesh, the majority of patients do not perform regular physical exercise. They are also heavy smokers (Rashid, Islam, & Islam, 2005). Although most patients with myocardial infarction feel concerned about life-threatening conditions, they do not regularly check or improve their conditions. They come to the hospital only when they have symptoms of disease because limited educational background impedes understanding of the severity of the disease. Hence, proper education programs are essential.

Most of the research indicates that long-term outcomes among post myocardial infarction are focused on the predictors of survival and medial prognosis. After patients developed myocardial infarction, myocardial tissue is permanently destroyed and patients are at risk for recurrence of this symptom. However, the recurrence myocardial infarction can be controlled and minimized through pharmacological and non-pharmacological interventions. Pharmacotherapy is more expensive and can sometimes lead to various complications. Bangladesh is a low income country and the majority of the population is composed for poor, low income people living in rural areas. Accordingly, only pharmacotherapy is relatively difficult to carry out for cost effective treatment of myocardial infarction.

Evidence supports that educational programs as non pharmacological intervention, are more effective methods of improving heart health indices to prevent

subsequent myocardial infarction attacks. Better understanding of health indices is important in order to improve health conditions as well as enhance positive health status. Studies have demonstrated that education programs designed to improve health indices yielding outcomes such as exercise, dietary modification and smoking cessation body mass index, control lipid profile would greatly reduce the risks of recurrent myocardial infarction. Practically, clinical nurses should recognize the importance of providing patient education designed to improve health indices (Ayana, Kritpracha, & Thaniwattananon, 2014). The most effective education program concern improving health with the promotion of knowledge and behavior. Behavior modification can improve health indices and reduce recurrent myocardial infarction with cardiac mortality, depending on patients' understanding. Moreover, to promote health care providers, especially nurses, in teaching patients about disease progression and the severity of myocardial infarction, modifiable risk factors and preventive process should be implemented in both medical and nursing care (Ahmed et al., 2013). Marvaki et al., (2007) conducted a study on subsequent mortality related to myocardial infarction, stating that this is the reason educational programs emphasizing the importance of motivating behaviors to improve health indices should be promoted. Other evidence further reveals patient education as one of the most basic and important care programs in the medical treatment system that is regarded as a special branch under the responsibilities and duties in all health professionals. Vardanjani et al., (2013) conducted a study among 122 myocardial infarction patients from hospitals at Iran University to identify the effects of face-to-face education with the use of educational booklets. After the educational program, the heart health indices of the patients with myocardial infarction improved, including changes in BMI, lipid profiles, smoking cessation, dietary habits and blood pressure with more positively improved physical activity in the experimental group compared with the control group. In Bangladesh, no evidence has been discovered on educational programs for patients with myocardial infarction.

Several studies have revealed educational program as being highly effective in improving health indices as a non pharmacotherapy intervention. It is easy, cost effective, and conducive to rapid recovery with no adverse effects. It is essential to enlist the willingness of patients in adopting lifestyle modifications after myocardial

infarction as a rational action to prevent subsequent cardiac events. Clearly, one of the most important goals of our educational program is to motivate patients with myocardial infarction to positively improve health indices.

## 1.2 Clinical problem of the study

Myocardial infarction is a lethal manifestation of Coronary Heart Disease (CHD) that may lead to sudden death. Myocardial infarction affects patients with physical, psychological, emotional, social and economical implications. Sylhet MAG Osmani Medical College Hospital is the author's clinical setting. The hospital is only a tertiary level government hospital in Sylhet Division where approximately 10 million people are dependent on health care. Many people come with different health problems. At Sylhet MAG Osmani Medical College Hospital, the incidence of myocardial infarction is also increasing and is numbered among the top 10 diseases requiring hospital admission. In 2011, there were 2,527(2.43%) myocardial infarction patients with an increase to 3,944(3.53%) in 2012. The mortality rate is relatively high at 192 (4.84%) in 2011 and 182 (4.19 %) in 2012. Myocardial infarction is the third leading cause of death among adult hospitalized patients in author clinical setting (Health Bulletin 2012 and 2013).

From the investigator's work experience, many factors have been found to affect recurrent myocardial infarction e.g. smoking, obesity, fatty foods, dyslipidaemia, hypertension, diabetes mellitus and inadequate physical exercise. According to the perspectives of Bangladesh and the author's experiences in the aforementioned clinical setting, most myocardial infarction patients have limited knowledge about improving health indices concerning myocardial infarction. Hence, it is indicated that more education is required in order to acquire essential knowledge about health indices and prevent the severity of complications and recurrent myocardial infarction. Nevertheless, most nurses do not provide health education to their patients during hospital admission or discharge periods concerning modifiable lifestyle, health indices, diet and severity of myocardial infarction. Nurses do not utilize research evidences or follow any evidence-based guidelines to improve health indices after myocardial infarction. Also in Bangladesh, no well-established evidence-

based education programs are available for patients with myocardial infarction. Therefore, the author would like to review the best available evidence and summarize the contents regarding educational programs. As a result, the aforementioned setting will obtain an effective educational program based on research evidence for improving health indices among adult patients with myocardial infarction.

## 1.3 Purpose of the study

To summarize all related evidence in regard to educational programs to improve health indices among adult patients with myocardial infarction and draw conclusions on recommendations based on the evidence obtained.

## 1.4 Expected benefits of the study

1.4.1 After completion of the study, the contents synthesized from the evidence can be used as recommendations for educational programs for improving health indices among adult patients with myocardial infarction.

1.4.2 Guidelines on educational programs for improving health indices among adult patients with myocardial infarction can be further developed and implemented in the clinical setting in Bangladesh.

# CHAPTER II
# METHODOLOGY

This study aimed to review evidences related to educational program to improve health indices among adult patients with myocardial infarction. For that reason, the review based on evidences available at the Mahidol university electronic database. The process of searching for evidence was employed to search and selected evidences. Appropriate evidences were appraised for their quality and practicability by considering the setting and situation, health care resources, and patient preferences and values. In this chapter II, the author described search strategy, appraisal methods and level of evidence as follows:

## 2.1 Search Strategy

The searching of evidence to improve health indices among adult patients with myocardial infarction by using the PICO framework (Melnyk, & Fineout-Overholt, 2005).

**2.1.1 Search framework:** The author searched and selected evidences for the educational program to improve health indices among adult patients with myocardial infarction by using the PICO Framework (Melnyk, & Fineout-Overholt, 2005) with the following details:

P = Population: Adult patients with myocardial infarction

I = Intervention: Educational program.

C = Comparison: Usual activity.

O = Outcome: Health indices.

**2.1.2 Scope of searching:** The educational program to improve health indices among adult patients with myocardial infarction based on validated evidences was searched from the following scope-

**1) Searching keywords used in the search according to the PICO framework:** The educational program to improve health indices among adult patients with myocardial infarction based on validated evidence-based practice was searched. The search used a Boolean operator, for each PICO element and collected any synonyms by connecting terms with "OR", then located citations that are relevant to all the PICO elements by linking with "AND".

| | |
|---|---|
| P (Population) | = Patients with "Myocardial infarction" or "Coronary heart disease" or "Heart attack" |
| I (Intervention) | = "Educational program" or "Health education" or "Patients counselling" or "Teaching program" or "Training program" |
| C (Comparison) | = None |
| O (Out come) | = "Health indices" or "Heart health indices" or "Modifiable health indices" or "health indicator" or "health indexes" |

**2) Evidence selection criteria:** The evidence in regard to the educational program for adult patients with myocardial infarction to improve health indices (lipid profiles, blood pressure, body mass index (BMI), smoking, diet, physical activity) were selected. All evidences are published in English with full text article from 2009 to 2014 and article.

**3) The databases used for searching**: The author based on validated evidences was searched from several electronic databases of the Mahidol University library system. Systematic reviews were searched from the Cochrane Database and Cumulative Index to Nursing and Allied Health (CINAHL). The search for single research studies was conducted from Ovid Full Text, Pro-Quest nursing, PubMed, Science Direct, and Springer Link. The author also conducted a manual search by looking for citations from reference lists from systematic reviews.

**4) Types of evidence:** The author searched for systematic reviews, high quality single randomized controlled trials and quasi experimental study acquired from full text studies published in English from 2009 to 2014.

## 2.2 Appraisal method and levels of evidence:

After conducting the search of evidences related to educational program to improve health indices among adult patients with myocardial infarction. The author appraised the various types of evidences according to appraisal method and level of evidences by Melnyk and Fineout- Overholt, (2011).

**2.2.1 Critical appraisal of evidence:** The author utilized appraisal method according to classification criteria of the Melnyk and Fineout- Overholt (2011) to appraise the quality, reliability and utility of the evidences. The collected evidences were apprising on the basis of the following three questions:

**1) Are the results of the study valid? (Validity):** The validity of empirical evidence refers to whether the evidence was conducted through scientific procedure and able to scientifically answer to the raising questions. Therefore, it is essential to appraise quality of the study methodology. The study needs to be determined whether it was conducted appropriately. Its validity must be certained. To appraise the study validity, probable sources of bias need to be recognized. Also, possibility of confounding variables in the study design needs to be evaluated. For example, randomization is an important step for the validity of a research and it helps more likely the results will be valid. Because it minimizes bias and possible impacts of confounding variables. Thus, appropriate random assignment process to minimize bias is needed to ensure the study's validity. Invalid measurement tools can introduce measurement bias as well.

**2) What are the results? (Reliability):** The reliability of evidence based on as for honesty, accuracy, stability, attainment and repeatability in order to anyone can achieve same experiment with using similar equipment, condition and achieve accurately the same outcome. The reliability can be assessing by intervention effect by considering both clinical significance and statistical significance of the results. Thus, it is important not only to recognize the study results and treatment effect, but also to

evaluate is reliability. Whether nurses could expect similar result, if they implemented the intervention in their own clinical practice setting (Melnyk, & Fineout- Overholt, 2011).

**3) Will the results help me in caring for my patients? (Applicability)**

**3.1 Transferability of the Findings:** The author evaluated the possibility of application in the clinical setting such as the similarities of service and resources, users and patients with myocardial infarction in the organization view of the readiness, values of care, form of practice in the organization and the number of service recipient patients are benefited from the program.

**3.2 Feasibility of Implementation:** The feasibility of implementation such as support received from authority and organizations was measured by the willingness of personnel, equipment, tools and instruments, any difficulty of methods, and abilities of nurses for application with regular work without rising workloads, eventually can be integrated in to the existing nursing practice.

**3.3 Cost / Benefit Ratio**: The utilization of evidence creates no risk to patient but gaining more benefit than formal practice. No additional expense required since the equipment used simple and available in unit as a result in reducing length of hospital stay, reducing medical expense, increasing client satisfaction. It is cost benefited.

**2.2.2 Level of evidence:** The studies were assessed strength of evidence by identifying the level of evidence Melnyk, & Fineout- Overholt, (2011). The criteria are as the following table-

**Table 2.1 Level of evidences**

| Level of evidence | Source of empirical evidence |
|---|---|
| Level I | Evidence from a systematic review or a meta-analysis of all studies that are RCT, or evidence from guidelines developed from a systematic review of research evidence from randomized control trials. |
| Level II | Evidence obtained from at least one RCT/ Well designed RCTs. |
| Level III | Evidence obtained from at least one well-designed controlled trials without randomized assignment. |
| Level IV | Evidence from well-designed case controlled and cohort studies. |
| Level V | Evidence from a systematic review of descriptive and qualitative study. |
| Level VI | Evidence from a descriptive or qualitative study. |
| Level VII | Evidence from the opinions, attitudes of experts on the issues or and/or a report written by expert committee. |

# CHAPTER III
# FINDINGS

The results of the search and the summary of samples of evidence are explained in this chapter in order to detail the interventions concerning the educational program to improve health indices among patients with myocardial infarction. The details are as follows:

## 3.1 Search results

The author searched for available samples of evidence from difference databases by using Mahidol University databases. In completing the screening evidence, the author found various types of evidence, including experimental research and systematic reviews. According to the search framework and scope of the search, the author found 30 samples of evidence based on educational program among adult patients with myocardial infarction. After the screening, 21 studies were excluded because some of them did not focus on educational programs for patients and did not provide enough information on the educational programs. The outcomes did not meet the criteria for outcomes of interest in this study. Therefore, a total of 9 studies were included in this study comprising 6 RCTs, 2 quasi experimental studies and 1 systematic review published in English from 2009 to 2014. The author then appraised the evidence based on the proposed appraisal method.

3.1.1 The list of the selected samples of evidence with their type and level of evidence is indicated in Table 3.1. The samples of evidence include 6 RCTs (Level-II), 2 qusi-experimental studies (Level-III) and 1 systematic review (Level-II).

**Table 3.1 List level and type of the selected sample of evidence**

| No | Authors/year/Title | Type of evidence | Level of evidence |
|---|---|---|---|
| 1 | Vardanjani et al., /2013. The effect of face-to-face education and educational booklet on heart health indexes of the hospitalized patients with myocardial infarction. | RCTs | II |
| 2 | Aminpour, Shahamfar, & Shahamfar, / 2014. Effects of lifestyle modification program in reduction of risk factors in patients with coronary heart disease. | RCTs | II |
| 3 | Meng et al., /2014. Evaluation of a standardized patient education program for inpatient cardiac rehabilitation: impact on illness knowledge and self-management behaviors up to 1 year. | Quasi-experiment | III |
| 4 | Shahamfar et al., /2010. Reduction of risk factors following lifestyle modification programe in patients with coronary heart disease. | RCTs | II |
| 5 | Uysal, & Ozcan, /2013. The effect of individual education on patients' physical activity capacity after myocardial infarction**.** | RCTs | II |
| 6 | Uysal, & Ozcan, /2012. The effect of individual training and counselling programme for patients with myocardial infarction over patients' quality of life**.** | RCTs | II |

**Table 3.1 List type and level of the selected sample of evidence (Cont.)**

| No | Authors/year/Title | Types of evidence | Level of evidence |
|---|---|---|---|
| 7 | Pourian, Salehi1, Kalhori, Abdyazdan, & Sharifi, /2013. Assessing the effect of Healthy Belief Model application on behavior change of the patients with myocardial infarction. | RCTs | II |
| 8 | Irmak, & Fesci, /2010. Effects of nurse-managed secondary prevention program on lifestyle and risk factors of patients who had experienced myocardial infarction. | Quasi-experiment | III |
| 9 | Ghisi, Abdallah, Grace, Thomas, & Oh, /2014. A systematic review of patient education in cardiac patients: do they increase knowledge and promote health behaviour change? | systematic review | II |

**3.1.2** The Author selected nine samples of evidence and briefly summarized each sample of evidence as follows:

**Evidence 1**

**1.1 Title:** The effect of face-to-face education and educational booklet on heart health indexes of the hospitalized patients with myocardial infarction.

**1.2 Authors:** Vardanjani, S. A. E., Fanisaberi, L., Shahraki, F. A., Khalilzadeh, A., Vardanjani, A. T., & Dehkordi, F. G. (2013).

**1.3 Publication source:** *Nursing Research and Practice,* 1-8. doi.org/10 .1155/ 2013/675634

**1.4 Brief summary of the study**

**1) Objective:** To study the effects of patient education aimed at improving the heart health status of patients with myocardial infarction through promotion of health-related behaviors and involvement of the patients in care programs and decision-making during the care period with reduced impact from cardiovascular diseases and improved quality life.

**2) Methodology of this study:**

2.1 Design of the study**:** Randomized controlled trial.

2.2 Study sample: The sample comprised 112 patients with myocardial infarction. 62 patients were randomly assigned into the experimental group and 50 patients were assigned in to the control group.

2.3 Inclusion criteria: First time diagnosis with myocardial infarction hospitalized patients. Aged below 70 years and ability to read and write with ejection fraction of at least 40%.

2.4 Exclusion criteria: Patients suffering anxiety and psychiatric-related disorders; patients who were medical and nursing staff.

2.5 Setting of the study: Two hospitals in Iran: Shaid Beheshti Medical University and another hospital at Iran University of Medical Sciences.

2.6 Outcome measurement: Questionnaires.

2.7 Data analyzed: The data was analyzed by SPSS software, version 15.

**3) Characteristics of educational program**

3.1 Education program**:** Face to face education program

3.2 Perform by the program: Researcher (Nurse)

3.3 Education Strategies: Face-to-face education and used educational aid tools such as educational booklet.

3.4 Setting of the education program: Hospital based individual education program for hospitalized patients.

3.5 Program duration and process**:** Individual education for 20 minutes in patients' rooms; group education with 2-5 patients for 20 minutes in the hospital clinic. Continuous follow up for 4 months until the first visit to review the topics and answer the questions following phone visits.

3.6 Contents for educational program: The educational contained are as follows:

1) Symptoms of myocardial infarction.

2) Causes of myocardial infarction.

3) Impact of disease.

4) Quitting smoking.

5) Importance of physical activity.

6) Observance of food.

7) Management of anxiety.

8) Control of blood pressure.

9) Drug regime.

10) Maintenance weight.

**4) Results:** The patients who received the educational program on cholesterol level (p=<0.001), systolic blood pressure (p=<0.05) and smoking cessation trends (p=<0.05) achieved more changes in BMI (p<0.05) with reduced anxiety (p<0.0001) compared to the control group.

**Evidence-2**

**2.1 Title:** Effects of lifestyle modification program in reduction of risk factors in patients with coronary heart disease

**2.2 Authors:** Aminpour, S., Shahamfar, M., & Shahamfar, J. (2014).

**2.3 Publication source:** *European Journal of Experimental Biology, 4(1),* 353-357.

**2.4 Brief summary of the study**

**1) Objective:** To assess the effectiveness of an individualized teaching program on the reduction of CHD risk factor in patients with myocardial infarction.

**2) Methodology of the study:**

2.1 Design of the study**:** Randomized controlled trial; randomized comparison group in pre and post-test experiments.

2.2 Sample of this study: The sample comprised 100 patients with myocardial infarction who were randomly assigned to a teaching group of 50 subjects and a control group of 50 subjects.

2.3 Inclusion criteria: Hospitalized patients with first attack of myocardial infarction.

2.4 Setting of the study: Coronary Care Unit, Shahyd Madani Heart Hospital.

2.5 Duration of the study: January 2004 to September 2004.

2.6 Outcome measurements: Self made questionnaire.

2.7Data analyzed: Data were analyzed by SPSS program. Paired t-test were used to experiment change the patients lipid profile compare with experimental and control group.

**3) Characteristics of educational program**

3.1 Educational program**:** Lifestyle modification program

3.2 Perform by the program**:** Researcher

3.3 Education strategies: Information was given verbally with the use of educational booklets.

3.4 Setting of the education program**:** Hospital-based individual teaching program in the coronary care unit.

3.5Program duration and process**:** Education was provided to the patients during hospitalization when the patients were in stable condition. The patients were ready to go their homes and received a 6-month package for education about lifestyle modification.

3.6 Contents for educational program: The routine topics were as follows:

1) Characteristics of myocardial infarction.

2) Risk factors and their modification.

3) Nutritional diet.

4) How to perform the physical exercise.

5) Importance of non smoking.

6) How to control blood pressure.

**4) Results:** The patients who received the educational program increased the number of non smokers from 30% to 88%, while exercise significantly increased from 30% to 80% and FBS also reduced ($p<0.05$) in comparison with the control group.

**Evidence-3**

**3.1 Title:** Evaluation of a standardized patient education program for inpatient cardiac rehabilitation: Impact on illness knowledge and self-management behaviors up to 1 year.

**3.2 Author:** Meng, K., Seekatz, B., Haug, G., Mosler, G., Schwaab, B., Worringen, U., & Faller, H. (2014).

**3.3 Publication source:** *Oxford Journals Permissions@oup.com*,1-12. doi:10. 1093/her/cyt107

**3.4 Brief summary of the study**

**1) Objectives:** To evaluate the short-term, intermediate and long-term effects of a new patient-oriented educational program as compared with a traditional lecture-based program for patients with Coronary Heart Disease receiving inpatient medical rehabilitation.

To explore the effects of the patient education program, intervention techniques and sub groups of patients who benefit most.

**2) Methodology of the study:**

2.1 Design of the study: Quasi-experimental study.

2.2 Sample of this study: The sample comprised 434 patients with myocardial infarction assigned to an intervention group of 220 patients given the patient-oriented program and a control group of 214 patients who used a lecture-based educational program.

2.3 Inclusion criteria: Primary diagnosis of coronary heart disease and hospitalization; Ages of 18 to 70 years.

2.4 Exclusion criteria: Inadequate German language ability; ages less than 18 years or more than 70 years; severe visual or hearing impairments, severe co-morbid psychiatric disorders and cognitive impairments.

2.5 Setting of the study: Two German cardiac rehabilitation hospitals.

2.6 Duration of the study: May 2010 to September 2011 with a 12-month follow-up ending in September of 2012.

2.7 Outcome measurements: Modified version of the Godin Leisure-Time Exercise Questionnaire; Healthy diet with a nine-item modified version of the self-report food list (LML Lebensmittelliste); Medication Adherence Report Scale (MARS-D).

2.8 Data analyzed: All statistical data were analyses by SPSS 18.0 for windows.

**3) Characteristics of educational program**

3.1Education program: The patient education program was based on theory-based self-management behaviors.

3.2 Perform of the program**:** The program was performed by an interdisciplinary team with sessions led by a physician, a psychologist and a physiotherapist.

3.3 Education strategies: Educational material used comprised flipcharts and booklet

3.4 Setting of the education program: Hospital based patient's oriented educational program and lectured-based program.

3.5 Program duration and process**:** The intervention group received a patient-oriented program in the form of a theory-based intervention. This intervention consisted of 5 sessions with each session lasting 45 minutes. At the first session, patients were encouraged personally and selected those cardiac risk factors were relevant to them. In the $4^{th}$ session, the patients were advised that health-related behavior for cardiac patients were discussed based on patients' experience and inpatient rehabilitation. Patients could reflect on their goals with regard risk goals to be carried out as homework. In the last session, the patients were instructed about self-monitoring behaviors. The program also included follow-ups at 6 and 12 months. The control group received a lecture-based education program consisting of two to four lectures with an open format.

3.6 Contents for educational program: The contents of the education program included the following:

1) Characterized of coronary heart disease.
2) Etiology and symptoms of disease.
3) Risk factors of myocardial infarction.
4) Medication and medication adherence.
5) To promote health behaviors.
6) Physical activity.
7) Healthy diet.
8) How to self-monitor behavior.

**4) Results:** The patients who received the education program on behavior modification (p=0.039) changed physical activity at p=0.053 with healthy diet at p<0.001, while treatment knowledge and medical illness increased (p=0.024) in comparison with the control group.

**Evidence-4**

**4.1 Title:** Reduction of risk factors following lifestyle modification programe in patients with coronary heart disease.

**4.2 Authors:** Shahamfar, J., Aslanabadi, N., Gupta, V., K., Daga, M., K., Zolfaghari, R., & Shahamfar, M. (2010).

**4.3 Publication source:** *Journal International Medical Sciences Academy, 23 (2),* 73-75.

**4.4 Brief summary of the study**

**1) Objective:** To the effect of a teaching program on patients with myocardial infarction by modification of risk factors or behavior modification.

**2) Methodology of this study:**

2.1 Design of the study**:** Randomized control trial.

2.2 Sample of this study: The sample comprised 100 patients with myocardial infarction assigned to an experimental group of 50 patients and a control group of 50 patients.

2.3 Inclusion criteria: Hospitalized myocardial infarction patients in stable condition.

2.4 Setting of the study: Coronary care unit Shahyd Madani Heart Hospital India.

2.5 Duration of the study: January to September 2004.

2.6 Outcome measurement: Questionnaire.

2.7 Statiscal analysis: Data were analyzed with the SPSS program. Paired t-test was used to test the patients' blood lipid profile with comparison between the experimental and control groups.

**3) Characteristics of educational program**

3.1 Education program: Lifestyle Modification program

3.2 Perform of the program: Researcher

3.3 Education strategies: Information was given verbally with the use of booklets.

3.4 Setting of the program: Hospital-based individual teaching program for hospitalized patients.

3.5 Program duration and process**:** Education during hospitalization when patients were in stable condition; patients received an educational package at discharge.

3.6 Contents for educational program patients with myocardial infarction: An individual teaching was given in five using routinely addressed topics in cardiac rehabilitation as follows:

1) Nature of myocardial infarction
2) Causes of myocardial infarction.
3) Modification of risk factor
4) Healthy diet
5) Importance of exercise
6) Control lipid profile
7) Importance of strop smoking.

**4) Results:** The patients who received the teaching program increased the number of non-smokers ($p<0.05$), significantly increased exercise from 30% to 88%, decreased triglycerides ($p<0.05$) and increased HDL level from 37.4 mg/dl to 38.9 mg/dl with reduced FBS ($p<0.05$) in comparison with the control group.

**Evidence-5**

**5.1 Title:** The effect of individual education on patients' physical activity capacity after myocardial infarction**.**

**5.2 Authors:** Uysal H., & Ozcan S¸ (2013).

**5.3 Publication source:** *International Journal of Nursing Practice*, 1-10. doi: 10.1111 / ijn.12193

**5.4 Brief summary of the study**

**1) Objective:** To determine the effects of individual education and counselling given to first-time myocardial infarction patients, including their effects on compliance with treatment.

**2) Methodology of the study:**

2.1 Design of the study: Randomized control trial.

2.2 Sample of this study: The sample comprised 90 patients with myocardial infarction who were randomly assigned to an intervention group of 45 patients and a control group of 45 patients.

2.3 Inclusion criteria: Hospitalized patients who received treatment in the program between the fifth and seventh days post-myocardial infarction; maximum age of 70 years, and no chest pain.

2.4 Exclusion criteria: Patients who had previously had acute myocardial infarction, participated in cardiac education and consultancy programs before, had chest pain and dyspnoea, or required bypass after myocardial infarction.

2.5 Setting of the study: Cardiology ward of two hospitals in Turkey.

2.6 Duration of the study: April to November of 2008.

2.7 Outcome measurements: International Physical Activity Questionnaire (IPAQ), 6MWT and Modified Borg Scale and Morisky Medication Adherence Scale.

2.8 Data analyzed: Data were analysis by the SPSS program. $X^2$ test was employed in the comparing of the experimental and control group.

**3) Characteristics of educational program**

3.1 Education program: Individual education program

3.2 Perform of the program**:** The individual education and counseling programs were performed by the researcher (nurse).

3.3 Education strategies**:** Individual counseling with the use of a visual material desktop.

3.4 Setting of the education program: Hospital based individual education program in the cardiology ward.

3.5 Program duration and process**:** The researcher arranged two interviews that were conducted with the patients in the intervention. The first interview began on the fifth and seven days after admission and lasted for one hour. The second interview took place at the fourth and eight weeks following discharge. Telephone counselling was conducted with the patients with continued follow-up for 3 months.

3.6 Contents for educational program are:

1) Information of myocardial infarction.

2) Medication.

3) How to coping the stress

4) Impact of smoking.

5) Alcohol consumption.

6) Control blood pressure.

7) How to perform the physical activity.

8) How to control body weight

9) Healthy diet.

10) The importance of control blood sugar.

**4) Results:** The patients receiving the education program increases the frequency of physical activity (p=0.001) with changes in body mass index (p=0.009), more changes in waist circumference (p=0.000) and improved compliance with drug treatment (p=0.000) in comparison with the control group.

**Evidence-6**

**6.1 Title:** The effect of individual training and counselling programme for patients with myocardial infarction over patients' quality of life**.**

**6.2 Authors:** Uysal H., & Ozcan S. (2012).

**6.3 Publication source:** *International Journal of Nursing Practice*; *18*: 445–453. doi:10.1111/j.1440-172X.2012.02058.x

**6.4 Brief summary of the study**

**1) Objective:** To identify the effects of individual training and counselling programe for patients having experienced myocardial infarction over patients' quality of life.

**2) Methodology of this study:**

2.1 Design of the study: Randomized control trial.

2.2 Sample of this study: The sample comprised 90 patients with myocardial infarction assigned to an experimental group of 45 patients and a control group of 45.

2.3 Inclusion criteria: Experience with first time myocardial infarction and patients hospitalized for 5-7 days with ages of 30-70 years.

2.4 Setting of the study: Cardiology wards at two hospitals in Turkey.

2.5 Duration of the study: April to November of 2008.

2.6 Outcome measurements: Questionnaires, MI dimension assessment scale (MIDAS), short form 36(SF-36), height, weight and waist circumference measurements.

2.7 Data analyzed: Data were analysis statistical package for social Science program.

**3) Characteristics of educational program**

3.1 Education program: Individual training and counselling program.

3.2 Perform of the program**:** Researcher (Nurse).

3.3 Education strategies**:** Training, used for counselling guide for post myocardial infarction and nine brochures

3.4 Setting of the education program: Hospital based individual training and counselling program.

3.5 Program duration and process**:** In the intervention group, all of the patients received individual training for 60 minutes on the fifth to seven days after admission. After discharge at the fourth and eighth weeks, one-hour telephone counseling was offered to the patients with continued follow up three months after discharge.

3.6 Contents for educational program patients with myocardial infarction: The content of the individual training program was planned according to patients' individual needs as follows:

1) Information about myocardial infarction.

2) Medication administration.

3) Management of stress.

4) Impact of smoking.

5) Alcohol consumption.

6) Hypertension management.

7) Importance of physical activity.

8) Control body weight.

9) Healthy diet.

10) Maintain blood sugar level.

4) **Results:** The intervention group that received the education program with increased smoking cessation (p=0.000), decreased BMI (p=0.009), decreased fat consumption (p=0.000), increased physical activity (p=0.000), decreased waist circumference (p=0.009) and improved quality of life (p=0.000) in comparison with the control group.

**Evidence-7**

**7.1 Title:** Assessing the effect of Healthy Belief Model application on behavior change of the patients with myocardial infarction.

**7.2 Authors:** Pourian, L. E., Salehi, S., Kalhori, R. P., Abdyazdan, G., & Sharifi, A. (2013).

**7.3 Publication source:** *Iran Journal Critical Care Nursing, 6(2),* 101-108.

**7.4 Brief summary of the study**

**1) Objective:** To assess the effects of Health Belief Model application on behavior modification in patients with myocardial infarction.

**2) Methodology of this study:**

2.1 Design of study: Randomized control trial.

2.2 Sample of this study: n=74 patients with myocardial infarction assigned to an experimental group of 37 patients and a control group of 37 patients.

2.3 Inclusion criteria: Hospitalized myocardial infarction patients.

2.4 Setting of the study: Imam Ali and Imam Reza hospitals Kermanshah Iran.

2.5 Duration of the study: 2011

2.6 Outcome measurements: Questionnaire of Moradi (2005), Health Belief Checklist and a five-point Likert scale.

2.7 Data analyzed: Data were analysis by SPSS -18 software and statistical t-test, chi-two and variance analysis.

**3) Characteristics of educational program**

3.1 Education program**:** The educational program was based on the Health Belief Model.

3.2 Perform of the program**:** The education program was performed by the researcher (nurse).

3.3 Education strategies**:** Used educational booklets.

3.4 Setting of the education program: Hospital based individual education (face to face) for hospitalized patients.

3.5 Program duration and process: The education program was divided into three sessions. The first session covered information about the program; the second session covered direct individual education and involved one family member. The third session determined the effectiveness of the educational program by having the patients and family members ask questions and encouraging answers to those questions. Each session lasted 30 minutes.

3.6 Educational program contents

1) Introduction of heart disease.

2) Sign symptom of myocardial infarction.

3) Adjusting risk factors.

4) Importance of healthy diet.

5) How to doing regular activities.

6) Importance of physical exercise.

**4) Results:** The patients who received the education program based on the Health Belief Model perceived the benefits of diet and exercise (p=0.001) with perceived barriers to diet and exercise (p=0.000), increased exercise activities

(p=0.004) and increased awareness about disease (p=0.002) compared with the control group.

**Evidence-8**

**8.1 Title:** Effects of nurse-managed secondary prevention program on lifestyle and risk factors of patients who had experienced myocardial infarction

**8.2 Authors:** Irmak, Z., & Fesci, H. (2010).

**8.3 Publication source:** *Applied Nursing Research 23*,147–152. doi:10.1016/ japnr.2008 .07.004

**8.4 Brief summary of the study**

**1) Objective:** To examine the effects of nurse-managed secondary prevention programs on the risk factors and lifestyle of patients who had experienced myocardial infarction (MI).

**2) Methodology of this study:**

2.1 Design of the study: Quasi-experimental and Pretest and post-test study.

2.2 Sample of the study: The sample comprised 36 patients with myocardial infarction.

2.3 Inclusion criteria: Patients suffering from myocardial infarction with ability to read and write; ability to be contacted by telephone.

2.4 Exclusion criteria: Patients with congestive heart failure, atrial fibrillation, unstable angina pectoris, sever obstructive pulmonary disease, paralysis, or orthopedic injury.

2.5 Setting of the study: Urban hospital Zonguldak, Turkey.

2.6 Duration of the study: July to December of 2002.

2.7 Outcome measurements: Questionnaire on smoking, physical activity, diet. Height was measured by a wallmounted stadiometer; weight was measured by a standard balance scale.

2.8 Data analyzed: Data were evaluated by paired –sample t test and the McNemar’s test.

**3) Characteristics of educational program**

3.1 Education program**:** Nurse managed secondary prevention program.

3.2 Perform of the program**:** Education program performed by the cardiology nurse

3.3 Education strategies: Individual teaching.

3.4 Setting of the education program: Hospital-based nurse-managed education program in the coronary intensive care unit and cardiology ward with continued follow-up and home visits.

3.5 Program duration and process: The individual education program consisted of six sessions. Each session lasted 30–40 minutes with follow-up for 14 weeks after discharge and four home visits.

3.6 Educational program contents**:**

1) Information on myocardial infarction -30 minutes.

2) Risk factors of myocardial infarction -30 minutes.

3) Control of hypertension- 20 minutes.

4) Changing nutritional behavior- 40 minutes.

5) Important of stop smoking - 15 minutes.

6) Physical activity- 20 minutes.

7) Drug management -20 minutes.

8) Behavior modification strategies; all sessions were completed three days before discharge.

**4) Results:** The patients receiving the nurse-managed education program stopped smoking ($p < .001$), improved nutrition ($p < .001$), increased physical activity ($p < .001$), decreased BMI ($p = .029$), decreased LDL cholesterol ($p < .001$), and increased HDL cholesterol ($p = .001$); controlled systolic blood pressure ($p < .001$) and decreased systolic ($p < .001$) and diastolic blood pressures ($p = .008$) in comparison with pre-test scores.

**Evidence-9**

**9.1 Title:** A systematic review of patient education in cardiac patients: Do they increase knowledge and promote health behaviour change?

**9.2 Authors:** Ghisi, G. L. M., Abdallah, F., Grace, S.L., Thomas, S., Oh, P. (2014).

**9.3 Publication source:** *Patient Education and Counseling 95*, 160-174. doi.org/ 10.1016/j.pec.2014.01.012

**9.4 Brief summary of the study**

**1) Objectives:** To investigate the impact of education on patients' knowledge.

To determine whether or not educational interventions are related to health behavior modification in cardiac patients.

To describe the nature of educational interventions.

**2) Methodology of the study:**

2.1 Design of the study: Systematic review.

2.2 Sample of this study: The sample comprised 42 articles. Thirty were experimental; 23 were RCTs, 7 were quasi-experimental studies, 11 were observational studies; 6 were cross-sectional in design, 5 were cohort studies, 4 were prospective studies, 1 was a retrospective study and 1 study used a mixed-methods design with 16,079 participants.

2.3 Inclusion criteria: Primary and secondary educational attainments were included; these were observational or interventional in design with quantitative findings. The article included cardiac patients with primary diagnosis of CAD, patients with myocardial infarction, patients undergoing coronary artery bypass graft surgery or percutaneous coronary intervention.

2.4 Exclusion criteria: No qualitative study was included. heart failure patients were excluded from this review.

2.5 Setting of the study: United States, United Kingdom, Netherlands, Sweden, Australia and Canada, China, France, Korea and Finland, Japan, Italy, Turkey.

2.6 Data extraction was undertaken by a single reviewer and checked by a second reviewer. The Downs and Black scale and a checklist were used to evaluate the methodological value of not only the randomized controlled trials but also the non-randomized studies which were selected to assess the quality of the study.

**3) Characteristics of educational program**

3.1 Education program: Patients education

3.2 Perform of the program: In this systematic review the educational program was performed by a nurse in 15 studies, a multidisciplinary team in 13 studies and a cardiologist in 4 studies.

3.3 Teaching strategies: Teaching materials included the sue of booklets, educational videos, educational audio recording, lectures etc.

3.4 Setting of the education program: This systematic review most of the study established hospital based individual and group education program.

3.5 Program duration and process: In this review, the average frequency of each educational session was 30-60 minutes with follow-up for 3-12 months.

3.6 Contents for educational program patients with myocardial infarction: In this systematic review, the educational interventions described in the 42 studies included 19 different topics.

1) Nutrition education,

2) Physical activity- Exercise.

3) Risk factors of myocardial infarction.

4) Psychosocial education -anxiety, stress, social support, emotion, relaxation techniques and self-management

5) Medication.

6) Smoking cessation.

7) Cardiac symptoms.

8) Behavior change strategies,

9) Metabolic syndrome.

10) Sexual activities.

11) Health belief and decision making.

12) Physiology of heart etc.

**4.Results:** This systematic review, studied the effects of the education program on smoking cessation with increase short-term ($p=.007$) and long-term ($p=.011$) effects a 6 months after the intervention, namely, smoking cessation ($p=0.02$), 12-month follow-up on smoking ($p<.001$), increased physical activity

(p<.001), increased regular exercise (p=<.001), increased walking performance at 3 months (p=0.001) and 6 months (p=0.002) and more increases in men (p<.001). The program also resulted in increased dietary habits (p=<.001), higher consumption of fruits and vegetables (p<.001) and lower consumption of saturated fatty acids (p<.001) while all four functional food consumption increased during the 1 year survey (p=<.001) and observation of the 43 articles.

**3.1.3** The author appraised each of the evidence and confirmed with the thematic paper advisors. A brief summary from evidence appraisal process was identified as follows.

**1)Validity:** The author appraised each study in order to assess its validity. In the terms of evidence validity, all nine samples of evidence were valid and published in well-known and accepted journals. All of the evidence objectives were clearly stated. The systematic review of comprehensive searches was conducted in line with the objectives by appropriate methodology. The selection criteria were explained and the criteria were appropriate. The quality assessment of the selected evidence was properly stated and the data from the evidence were adequately presented. Moreover, the samples of evidence selected for this study comprised quality evidence. For experimental studies, the study methodology was appropriate. Some studies did not provide adequate details on group assignment and measurement. Two studies (quasi-experimental studies) did not use random assignment. These may have caused some bias. All of the evidence had sufficient sample group patients with myocardial infarction and comparison of educational programs in experimental and control groups. Lastly, the data yielded by the search were properly analyzed.

**2) Reliability:** All nine samples of evidence were analyzed and evaluated for quality according to processes with sufficient quality implementation of the research findings. Regarding health indices among patients with myocardial infarction, the studies were reliable with reasonably implemented cognitive bases and clinical interpretation, significance in reviews and evidence. The results were assessed to summarize the research findings with statistical significance and clinical relevance by considering the findings in the systematic review. The content of these studies was based on knowledge concerning effective education programs for

improving health indices among adult patients with myocardial infarction. All of studies showed significant effects from educational programs, including lipid profile control, blood pressure control, smoking cessation, BMI, physical activity and diet.

**3) Applicability:** The applicability based on patients was similar and interventions are feasible in the clinical settings. The clinically relevant results were the benefits outweighing the probable harm. The author evaluated the possibility of application in the clinical settings. All of the study sample groups were similar to patients with myocardial infarction in Bangladesh in terms of health condition. All of the outcome measurements were considered and most of the measurements were feasible. The majority of the study teaching programs were similar and applicable in the clinical settings. All of the studies were measured in terms of trust, feasibility of application in clinical settings with the abilities of nurses and health care providers. Patients and families were benefited. However, support was offered by the authorities as essential to implementation in the study intervention effectively. Application with regular work and without increasing workload should be done by integrating the intervention with the existing nursing practice. The utilization of evidence creates no risk for patients but gains more benefit than formal practice. Only some additional expenses are required since the equipment used was simple and available in every unit. As a result, the length of hospital stay and medical expenses will be decreased and client satisfaction will be increased. The costs are worthwhile.

## 3.2 Conclusion

**3.2.1 Summary of the samples of evidence:** As previously mentioned, the researcher selected nine samples of evidence comprising 6 RCTs, 2 quasi experimental studies and 1 systematic review published in English from 2009 to 2014. It can be summarized that an educational program is an effective strategy for improving health indices among adult patients with myocardial infarction because the program can modify patients' health behaviors and consequently improves patients' health indices and quality of life. Furthermore, these programs can prevent subsequent

attacks or re-infarction. The types of educational program were varied in terms of evidence-to-evidence according to the environmental situation and patient beliefs and culture. According to the samples of evidence, the program was hospital-based with both individual and group education. Two studies used theory-based education programs including self management models and the Health Belief Model. The educational strategies included lectures, counseling, discussions, presentations, face to face education and telephone contact. The above strategy identified the majority of the studies as employing counseling and educational material with booklets. However, the samples of evidence revealed that hospital-based individual programs were more effective than the group programs. Most of the studies indicated that educational programs were applied when patients were stable conditions and during the discharge period as delivered by nurses and multidisciplinary teams. The educational sessions varied in duration of the program at hospital before discharge only one session from 60 minutes. Some study educational session consists three to five sessions with 30 to 60 minutes and for up to three to twelve months with continuous follow-up by telephone.

The educational interventions described in the nine articles contained different content. The common content used covered the nature of the disease with the etiology, symptoms and impact of myocardial infarction; how to control risk factors such as smoking cessation, the importance of physical activity, regular physical exercise, healthy diet, blood pressure control, tobacco and alcohol consumption and blood lipid profile control. Other content covered medication management, anxiety management and self-management with strategies for modifying unhealthy behaviors, metabolic syndrome, sexual activity, health beliefs and some irrelevant relevant. The findings of this review demonstrate that the nine articles used various measurement scales to measure the outcomes. Moreover, most of the studies revealed that patients gained greater benefits and improves health indices if the patients received educational programs including topics such as eating habits, lipid profile control, smoking, physical activity, blood pressure control, decreased body weight and changed BMI.

**3.2.2 Recommendations from the 9 samples evidences:**

1) An educational program is an effective strategy for improving health indices among adult patients with myocardial infarction. Therefore, every health care setting should offer such programs to patients (Aminpour et al., 2014/Level-II; Ghisi et al., 2014/Level-I; Irmak, & Fesci, 2010/Level-II; Meng et al., 2014/Level-II; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

2) Education programs should be provided when patients are hospitalized. The initial session should be started when the patients are in stable condition. When patients are ready to be discharged from the hospital, they should be equipped with an educational program in order to be well-prepared before returning to their previous activities at home (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

3) Individual education should be conducted among adult patients with myocardial infarction because it is more effective; individual education also requires that a patient be more active during the learning process and that the individual be able to choose his/her learning time (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

4) The hospital-based individual teaching program may be helpful and beneficial at reducing the risk factors of atherosclerosis in patients with myocardial infarction (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Shahamfar et al., 2010/Level-II).

5) Individualized education with additional counseling programs are more effective for improving patients functional status and quality of life. Hence, this program should be administered in health care settings in which there are adequate resources for myocardial infarction patients before discharge (Ghisi et al., 2014/Level-II; Uysal, & Ozcan, 2012/Level-II; Uysal, & Ozcan, 2013/Level-II).

6) Theory-based education within the framework of the Health Belief Model should increase the level of awareness and perception of heart disease and increase benefits in patients with myocardial infarction (Pourian et al., 2013/Level-II).

7) Self-management programs should be referred to as useful for behavior modification in relation to sufficient knowledge about modifiable risk factors, compliance with medication and improved quality of life (Ghisi et al., 2014/Level-II; Meng et al., 2014/Level-III).

8) Educational programs can be performed by nurses in hospitalized patients. Nurses can easily implement risk reduction programs, including assessment, intensive education, follow-up and referral of patients to other medical disciplines, if necessary (Aminpour et al., 2014/Level-II; Ghisi et al., 2014/Level-II; Irmak, & Fesi, 2010/Level-III; Pourian et al., 2013/Level-II; Shah et al., 2011/Level-II; Uysal, & Ozcan, 2012/Level-II; Uysal, & Ozcan, 2013/Level-II Vardanjani et al., 2013/Level-II).

9) Few study educational programs should be performed by interdisciplinary teams (Ghisi et al., 2014/Level-I; Meng et al., 2014/Level-III).

10) Education teaching material should employ the use of educational booklets (Aminpour et al., 2014/Level-II; Ghisi et al., 2014/Level-II; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Vardanjani et al., 2013/Level-II).

11) Some other educational material should be applied such as presentations, flipcharts, videos and tapes (Ghisi et al., 2014/Level-II; Meng et al., 2014/Level-III).

12) Telephone follow-up should be more effective for myocardial infarction patients after discharge (Ghisi et al., 2014/Level-II; Uysal, & Ozcan, 2012/Level-II; Uysal, & Ozcan, 2013/Level-II Vardanjani et al., 2013/Level-II).

13) The sessions and the duration of the entire program should be varied with 1-6 sessions and each session lasting for 30- 60 minutes (Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-II; Meng et al., 2014/Level-II; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II)

14) Some of the evidence should provide education for patients during the admission period at one hour and 4-8 weeks after discharge with telephone follow-up (Aminpour et al., 2014/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

15) All of the evidence performing teaching activities should be based on the following content:

15.1 Describe the nature and etiology of myocardial infarction (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II)

15.2 Explain the signs, symptoms and impact of myocardial infarction (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

15.3 Most of the studies explained the risk factors of myocardial infarction and their modification such as smoking, obesity, physical activity, diet, lipid profile, body mass index and blood pressure (Aminpour et al., 2014/Level-I; Ghisi et al., 2014/Level-II; Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

15.4 Medication management (Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Uysal, Ozcan 2013/RCTs; Uysal, Ozcan 2012/RCTs; Vardanjani et al., 2013/Level-II).

16) Patients should receive continue hospital follow up after discharge for a period of three to six months (Meng et al., 2014/Level-III; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

17) Patients should receive education programs to improve health indices, including coverage of the following topics: lipid profile control, improved physical activity, smoking cessation, more changes in body mass index and improved healthy

diet with blood pressure control (Aminpour et al., 2014/Level-II; Ghisi et al., 2014/Level-I; Irmak, Fesci, 2010/Level-II; Meng et al., 2014/Level-II; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II; Uysal, & Ozcan, 2013/Level-II; Uysal, & Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

18) Patients should receive education programs to improve knowledge about disease (Ghisi et al., 2014/Level-I; Irmak, & Fesci, 2010/Level-III; Meng et al., 2014/Level-III; Pourian et al., 2013/Level-II; Shahamfar et al., 2010/Level-II).

19) Patients receiving education programs receiving coverage of modification of risk factors (Ghisi et al., 2014/Level-II; Aminpour et al., 2014/Level-II; Shahamfar et al., 2010/Level-II; Vardanjani et al., 2013/Level-II).

20) Patients should receive education programs to modify health behaviors (Ghisi et al., 2014/Level-II; Irmak, Fesci, 2010/Level-III; Uysal, Ozcan, 2012/Level-II; Vardanjani et al., 2013/Level-II).

21) After education program, quality of life should be improved (Ghisi et al., 2014/Level-II; Uysal, Ozcan, 2012/Level-II; Uysal, Ozcan, 2013/Level-II;

# CHAPTER IV
# CONCLUSION AND SUGGESTION

## 4.1 Conclusion

Myocardial infarction is escalating as a major health problem leading to high morbidity and mortality in every region of the world. In the author's clinical setting at a government hospital in Bangladesh, myocardial infarction incidence has increased and become third-leading cause of death among adult hospitalized patients. Most adults suffering from myocardial infarction in Bangladesh have minimal educational backgrounds with insufficient knowledge for self-care during illness. This problem affects patients' physical, psychological, social, economic and realistic aspects of life. The most important factor in preventing the onset and recurrence of myocardial infarction is to improve health indices, including lipid profiles, maintaining body weight and smoking cessation with physical activity and controlled blood pressure. Most of the patients fail to achieve health indices due to deficient knowledge about the disease because in Bangladesh and the author's clinical setting, nurses do not provide health education for patients and do not follow evidence-based guidelines. Current scientific evidence is highly important in controlling recurrent myocardial infarction, because evidence provides updated information, proper post myocardial infarction management and better patient outcomes. Moreover, evidence-based practice keeps nursing practice both current and relevant with the aim of improving quality care and increasing patient knowledge. Hence, evidence-based education program is helpful in improving health indices among patients with myocardial infarction. The aim of this study was to summarize current evidence on educational programs for improving health indices among patients with myocardial infarction.

With the above objective the author searched for evidence the several electronic databases sources in the Mahidol University Library system. The Cochrane database, Cumulative Index to Nursing and Allied Health (CINAHL), Ovid Full Text,

Pro-Quest Nursing, PubMed and Science Direct were used to search for single research studies. The search for evidence was conducted by using the PICO framework. The author appraised the research evidence obtained by using the method and criteria for testing validity, reliability and applicability. The aforementioned evidences were composed of six randomized control trials, two quasi-experimental studies and one systematic review published in English from 2009-2014.

The evidence revealed that educational programs frequently delivered in hospitals are based on group and individual programs conducted by nurses and other multidisciplinary team members. Some evidence used theory based education program including Self Management Model and Health Belief Model. Most of the evidence teaching methods used educational booklets. Majority of the evidences the session as well as duration of the education program at hospital before discharge covered only one session one hour and after discharge telephone follow-up. However, some evidence the education program can be provided up to three to five session with 30-50 minutes per session as appropriate to cover all content. The common content information about disease, causes, sign and symptom, impact, modification of risk factor, self management, behavior strategies. The results from the evidence synthesis revealed the following: 1) education program are more effective for patients with myocardial infarction; 2) after education program, patients improved health indices, including lipid profile and control blood pressure control, increased physical exercise, smoking cessation, changed body mass index, improve healthy diet; 3) improved patients knowledge about the disease; 4) modification of risk factors; 5) modified post-program patient behavior and improved quality of life. All nine samples of evidence are clearly described in terms of procedures, measuring scale, duration, time and type of education program.

It can be concluded that educational programs are more important and convenient process than pharmacological treatment for every country because such programs promote healthy lifestyles for myocardial infarction patients. Hence, the author decided that her clinical setting should implement an educational program to improve health indices among patients with myocardial infarction.

## 4.2 Suggestion

The review of evidence-based nursing concerning the issue relevant to clinical practice and clinical research about educational programs for improving health indices among adult patients with myocardial infarction suggests that implementation of educational programs should be applied as follows:

### 4.2.1 Nursing Practice

1) The nursing practice guidelines on educational programs for improving health indices among adult patients with myocardial infarction should be developed using the recommendations derived from the evidence-based practice.

2) The guidelines should be applied according to the situation of the clinical settings in Bangladesh. The resources used to improve health indices for the patients and the method for arranging the education program should be modified to suit the clinical practice environment.

3) Simple guidelines should be formed for the educational program among patients with myocardial infarction for nursing practice in a clinical setting.

4) The educational program and accompanying materials should be developed for patients with myocardial infarction before implementation in a clinical setting.

5) The guidelines should be presented to the authority of the clinical setting to gain acceptance and support.

6) Training program should be arranged by authority for nurses before implements intervention.

7) Education program should be established hospital-based individual education programs.

8) Individual education program should be provided to the patients during hospitalized period when patients were stable condition.

9) Education program should be conducted by the nurse.

10) The content of existing education program should be reviewed to ensure that revisions can be made in the recommendation as suitable for implementation of the content in consideration of age, gender, educational attainment

and customs of patients with myocardial infarction in order to achieve optimal benefits.

11) Hospitals should conduct follow-up on patients with myocardial infarction during the first month at every 2 weeks with monthly follow-ups until six months.

12) During the follow-up period the patient's lipid profile, blood pressure, blood sugar, weight and body mass index should be measured.

13) Communicate with all stakeholders regularly and meet together monthly to building relationships and rapport.

14) Build acceptability for multidisciplinary health care teams including nursing superintendents, head nurses of the coronary care unit, nursing instructors, physical therapists, dieticians, cardiologists and clinical nurses assigned to the coronary care unit.

15) Cardiac education coroner should be developed at coronary care unit for hospitalized patients.

16) Nursing performance should be evaluated to assure that all standard nursing procedures for improving health indices by the education program are implemented.

17) In accumulation to raising awareness about effective to improve health indices among adult patients with myocardial infarction, the structure of the education program should be disseminated to determine the effectiveness of the program in other health care setting.

### 4.2.2 Nursing Research

1) The educational intervention for from the recommendations should be developed and tested the feasibility of the program by conducting a pilot study.

2) An experimental study should be further conducted prior to implementation of the recommended education program for improving health indices among adult patients with myocardial infarction to evaluate the effectiveness of the recommendations for the educational program.

3) Health expenditures should be used as a variable to reflect the outcomes of the education program.

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