

## **ABSTRACT**

### **BACKGROUND**

Coronary artery disease(CAD) is the major non-communicable disease causing mortality and morbidity in the developed and the developing countries contributing to approximately 50% of global mortality. Pharmacological treatment alone may not be a panacea for such diseases, moreover, it may be associated with various adverse effects. Hence strategies such as Yoga involving healthy lifestyle and stress management are widely sought by the patient population. Yoga is known to contribute towards cardiovascular health. Studies have clearly demonstrated that cardiac rehabilitation programs are able to meet the needs of the patient with a high degree of satisfaction from the patients' side. Supervised rehabilitation help the patient overcome their apprehension towards physical activity which reflects in a confident perusal of their activities of daily living. In spite of the documented benefits of cardiac rehabilitation, only a handful of heart patients participate in such programs. Options other than exercise based rehabilitation are less available which partly explains the suboptimal uptake of such programs by the patient population. Yoga, which has been practiced for centuries in the Indian subcontinent incorporates an unconventional form of physical exercise. The role of yoga in the modification of cardiovascular risk factors and incorporating the same in the rehabilitation of post MI patients are less explored. There is also a necessity to explore the practicality and suitability of incorporating yoga into the comprehensive cardiac rehabilitation program in an effort to add value and increase the efficacy with proper evidence to support the same as well as to improve reference to such centers. This study describes the development of need-based yoga program suitable to be integrated into the comprehensive cardiac rehabilitation of post-myocardial infarction patients with left ventricular dysfunction and to evaluate the efficacy of IAYT based cardiac rehabilitation in improving the

cardiac function and managing the cardiac risk factors in acute MI patients with left ventricular dysfunction.

## **AIMS AND OBJECTIVES**

Study 1: The aim of the study was to provide a comprehensive review of available research evidence in the field of cardiovascular health through a bibliometric analysis.

Study 2: The aim of the study was to compile and validate a yoga model for cardiovascular health with the help of experts.

Study 3: The aim of the study was to evaluate the efficacy of Integrated Approach of Yoga Therapy (IAYT) based rehabilitation program adjunct to conventional pharmacological management in the improvement of cardiac function, quality of life, serum lipid levels and reduce anxiety and depression in patients with left ventricular dysfunction following myocardial infarction.

The objectives of this study were

- ✓ to perform a thorough literature search in the field of yoga and cardiovascular health through bibliometric analysis.
- ✓ to compile and perform expert validation of a yoga module useful for patients under cardiac rehabilitation.
- ✓ to evaluate the efficacy of yoga therapy on cardiac function in patients with left ventricular dysfunction following myocardial infarction.
- ✓ to assess the effectiveness of yoga therapy in reducing anxiety and depression of patients with left ventricular dysfunction following myocardial infarction.
- ✓ to evaluate the efficacy of yoga therapy in improving the quality of life of patients with left ventricular dysfunction following myocardial infarction.

## **METHODS**

### **Bibliometric analysis**

An electronic search of Pub Med as a standard bibliographic database was performed through February 2015 using the keywords “Yoga” and “Cardiovascular.” Studies with Yoga as the independent variable and parameters related to cardiac health as the dependent variable were included and exclusion criteria were applied. Two authors independently extracted data using a standardized data extraction form. All relevant data on study design and settings, types of participants, interventions, and outcome measures were extracted and recorded in the data extraction form. Data analysis using SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc. were performed and the data presented by counts, percentages, and frequency.

### **Development and validation of yoga module for cardiac health**

Based on the assessment of the need of the patients, literature review, and expert opinion, a yoga module was developed using the qualitative method of inquiry. The program included warm-up exercises, yogic asanas, pranayama, meditation and counseling sessions. A structured questionnaire eliciting comments on the contents was given independently to ten experts working in the field of health and yoga for validation. The final module was derived after incorporating the suggestions of the experts. This developed module was incorporated into the randomized control trial involving cardiac rehabilitation program of post myocardial infarction program.

### **Integrated yoga practice in Cardiac Rehabilitation Program- A Randomized Control Trial.**

**Participants:** 66. Yoga-practicing group (n=33) and a control group (n=33)

**Design:** Randomized controlled trial

#### **Assessments:**

- Cardiac Function- Left Ventricular Ejection Fraction (LVEF)
- Anxiety and depression

- Lipid profile
- Quality of life

**Intervention:**

The participants were randomly assigned to two groups, namely, Group 1- yoga and Group 2- control. The yoga group received one hour supervised yoga thrice a week for 12 weeks along with the standard pharmacological therapy prescribed for the condition. The control group received standard care that included pharmacological treatment and the instructions of the cardiologist.

**RESULTS:**

There was no statistically significant difference in LVEF (U=420.500, P value= 0.218) between the two groups. However, the yoga-practicing group showed significant reduction in depression (CDS, U=71 P value=0.0), anxiety (HAM-A, U=128, P value=0.0), and a significant increase in quality of life scores (DASI, U=146, P value=0.0; and METs, U=136, P value=0.0) at 3 months compared to control. Overall, the CAD patients practicing yoga showed a favorable profile compared to control individuals on Cardiac Depression Scale (CDS), Hamilton Anxiety Rating Scale (HAM-A), Duke Activity Status Index (DASI) and Metabolic equivalent (MET) outcomes. Control and yoga practicing groups did not differ significantly in the lipid levels.

**CONCLUSION:**

This study indicated that the integration of yoga practice in a cardiac rehabilitation program is feasible and has no added benefit in improving the cardiac function. However, the addition of yoga to cardiac rehabilitation may be beneficial in reducing depression, anxiety, and improving QOL in patients.