

# Evaluation of Fear Avoidance Belief and Kinesiophobia in Patients after Undergoing In-Patient Cardiac Rehabilitation Post Cardiac Surgery

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## ABSTRACT

**Background:** Many patients undergoing cardiac rehabilitation do not have the habit of exercising regularly and get discouraged from it very quickly. Based on clinical experience, patients with coronary artery diseases (CAD) often have doubts on the safety of performing physical activity due to the disease, and consequently they avoid physical activity. Avoidance behavior is adaptive as a natural response to acute injury. Aim of the study was to evaluate Fear avoidance belief and Kinesiophobia in patients after undergoing in-patient cardiac rehabilitation post cardiac surgery.

**Methods:** In total 30 patients posted for planned cardiac surgery were recruited according to the inclusion criteria. Tampa Scale of Kinesiophobia (TSK) was used to measure kinesiophobia or fear of movement and Fear Avoidance Belief questionnaire- physical activity (FABQ-pa) scales was used to measure patient's belief with regards to effect of physical activity both pre-operatively and after in-patient cardiac rehabilitation post cardiac surgery.

**Results:** Majority of cardiac patients included in the study had coronary artery disease and rheumatic heart disease. Patients presented an elevated level of kinesiophobia and fear avoidance belief to physical activity pre-operatively. Kinesiophobia and fear avoidance to physical activity reduces significantly after undergoing in-patient cardiac rehabilitation post cardiac surgery. Student's t test revealed a statistically significant reduction in the scores of TSK and FABQ (pa) after undergoing in-patient cardiac rehabilitation post operatively ( $p=0.00$ ).

**Conclusion:** In-patient cardiac rehabilitation helps in reducing Fear avoidance belief (physical activity) and kinesiophobia in patients post cardiac surgery.

**Key words:** Kinesiophobia, Fear avoidance belief, cardiac rehabilitation

## INTRODUCTION

Cardiovascular diseases (CVD) are the most frequent cause of death and disability worldwide, and are anticipated to continue to be so in the future. <sup>[1]</sup> Prevalence of Coronary Heart Diseases (CHDs) is between 7-13 per cent in urban and 2-7 per cent in rural India. If the current trend continues by the year 2020, the burden of

atherothrombotic CVD in India will surpass other regions of the world. <sup>[2]</sup> According to the World Health Organization (WHO), 60 to 85% of people in the world – from both developed and developing countries – lead sedentary lifestyles, which is a one of the most serious problems of public health. <sup>[2]</sup> Data from WHO estimates that approximately 3.2 million deaths each year

are caused by insufficient physical activity, [2] which represents almost 3.5% of all deaths. Data from literature shows that a well-conducted movement therapy reduces the risk of death by 20-25%, which is comparable to the effects of drugs that are commonly used for heart disease. [2,3] Many authors emphasize that encouraging people leading a sedentary lifestyle to a greater daily physical activity in the form of simple and accessible exercises like walking and stair climbing would bring the greatest health benefits. Early identification and diagnosis of the causes that result in motor passivity can make a big difference not only in the primary prevention of CVDs, but it can also lead to improved efficiency of cardiac rehabilitation in the long term to prevent further hospitalizations. [3]

Kinesiophobia is described as excessive, irrational and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or re-injury. [4] Fear of movement has been identified in relation to the fear avoidance belief model as an important factor showing that some patients develop impairment, disability and depression in relation to chronic pain. [4] Fear-avoidance belief (FAB) means that the individual avoids activity or movement due to a perception that it can cause injury. [5] Avoidance behaviour is adaptive as a natural response to acute injury. [5] Patients who cannot cope with their fear of exercise thinking it would trigger angina generally develop long-term avoidance to physical activity. [6] Clinical experience shows that patients are often afraid of physical movement, raise lot of concerns and doubts about safety of performing a particular exercise and need guidance to find a suitable activity. [7] Fear of movement has been reported to be strongly associated with limitations in physical activities, and previous studies have suggested that FAB and kinesiophobia are likely to occur in patients with heart-related problems. [8]

Studies have shown use of Tampa Scale of Kinesiophobia (TSK) and fear

avoidance belief questionnaire (FABQ) in patients with coronary artery disease (CAD). [9] There have been studies which shows use of FABQ (only physical activity component) independently. [10] Studies have shown that patients with higher levels of kinesiophobia participated to a lesser extent in cardiac rehabilitation, had lower levels of physical activity, poorer muscle function and health-related quality of life and a higher degree of anxiety and depression, compared with the group with low levels of kinesiophobia. [8,11] The identification of causes of physical inactivity and determining the barriers of physical activity may constitute an important element of cardiac rehabilitation process, which would improve its effectiveness and decrease the risk of cardiac incident in the future. [3]

Many patients undergoing cardiac rehabilitation have never regularly exercised before and get discouraged very quickly. [8] Based on clinical experience, patients with CAD often have doubts that physical activity can be performed safely due to the disease, and consequently they may avoid physical activity and exercise. Avoidance behavior is adaptive as a natural response to acute injury. The problem of physical inactivity is complex. [12] Both biological and psychosocial factors are reflected in shaping of hypokinetic attitudes. Hence this study aimed to evaluate Fear avoidance belief and Kinesiophobia in patients after undergoing in-patient cardiac rehabilitation post cardiac surgery. Objectives were to evaluate FAB (pa), kinesiophobia in patients pre-operatively & post operatively after undergoing in-patient cardiac rehabilitation (at the time of discharge) and to study the changes in both scores.

## **MATERIALS AND METHODS**

After obtaining Institutional ethical approval and signed informed consent, total of 30 patients posted for planned cardiac surgery were recruited from the cardiac surgery wards of a tertiary care hospital. Study procedure was explained to the patients and confidentiality of the data was

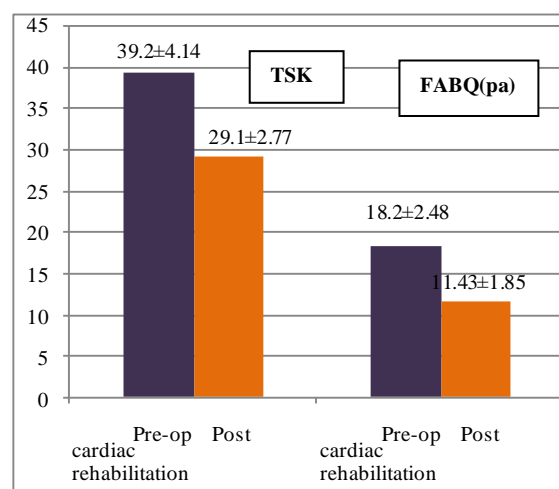
assured. Patients with congenital heart disease, unstable hemodynamic parameters, ones who couldn't undergo in-patient cardiac rehabilitation as per routine protocol and with known psychological disorders were excluded from the study. Demographic data, general medical surgical history and surgical notes were noted. Tampa Scale of Kinesiophobia (TSK) which is a valid, reliable [13] tool was used to assess Kinesiophobia. It consists of 17 questions, wherein there were four options namely: 1- strongly disagree, 2- disagree, 3-agree, 4- strongly agree and the total score of which adds up to 68. A score  $\geq 34$  is suggestive of Kinesiophobia. Fear avoidance belief questionnaire (physical activity) [FABQ (pa)] was used to measure fear avoidance belief to physical activity. [8] FABQ consists of two components i.e. physical activity and work. Only physical activity component was taken in this study as it was limited to in-patient cardiac rehabilitation. Physical activity sub-scale of FABQ has 4 questions (maximum score is 24; and a score  $\geq 15$  is considered elevated). In the original statement, the words "pain" and "back" often recur. In this study, we used the words "complaints" and "heart", respectively as used by Kristina Åhlund et al. [8] A higher score indicates more strongly held fear avoidance beliefs. Pre-operative assessment was done using both the scales at the time of admission in the hospital. Post operatively patients underwent in-patient cardiac rehabilitation as per the routine hospital protocol. In-patient cardiac rehabilitation consisted of patient education about the disease process, importance of exercises in reducing anxiety and post operative complications, breathing exercises, thoracic expansion exercises, mobility exercises for the extremities and ambulation. Patients were re-assessed using FABQ (pa) and TSK only after undergoing minimum 2 weeks of in-patient cardiac rehabilitation at the time of discharge from hospital.

### Statistical Analysis:

Data was analyzed using SPSS version 17 software. Descriptive statistical analysis was used to find out the mean, standard deviation of the variables. Student's paired t test was used to compare pre and post in-patient cardiac rehabilitation scores of TSK and FABQ (pa).

## RESULTS

Majority of patients were males (70%, n=21) with a mean age of sample being was  $53.33 \pm 7.6$  years. About 33.33 % were diagnosed case of Rheumatic heart disease with mitral stenosis and Coronary artery disease (CAD) each, 23.33 % had triple vessel CAD and 10% had double vessel CAD. Majority of patients (86.66%) had kinesiophobia (TSK score  $\geq 34$ ) pre-operatively. Whereas only 6.67% of the patients had kinesiophobia after undergoing in-patient cardiac rehabilitation post operatively. About 90% of the total patients had Fear avoidance belief (FABQ-pa score  $\geq 15$ ) to physical activity pre-operatively whereas only 6.67% of the patients had it after undergoing in-patient cardiac rehabilitation post operatively. Student's t test revealed a statistically significant reduction in the scores of TSK and FABQ (pa) after undergoing in-patient cardiac rehabilitation post operatively ( $p=0.00$ ) as shown in Graph1.



Graph 1 showing Comparison of mean scores of TSK and FABQ (Physical activity)  
\* Level of significance  $p < 0.05$ .

## DISCUSSION

The study have shown that 86.66% of the total number of patients with cardiac disorders are kinesiophobic when assessed pre-operatively using TSK and about 90% of the patients have fear avoidance belief to physical activity when assessed pre-operatively using FABQ (physical activity). People with heart disease were also slightly more likely to believe that “Once you have had one heart attack you are bound to have another one”. This may reflect the perception of the need to discourage any physical fitness, exercise or excitement in people with heart disease. [3] It has been estimated that 40% to 50% of coronary patients do not return to work due to psychological reasons (i.e. fear of physical activity that might lead to a cardiac event. [14] One of the most commonly reported reasons for poor adherence and avoidance to exercise programs is a lack of motivation. [15] Therefore, maximum number of patients with cardiac disorders could have had kinesiophobia pre-operatively due to chest pain/discomfort which restricts the patients’ physical activity in fear that it might lead to cardiac event.

Studies have shown that patients after recent CAD events have demonstrated a very high prevalence of generalized anxiety and moderate to severe anxiety symptoms. [16] Currently, moderate intensity training is used not only in the prevention of coronary heart disease, but also as part of the treatment after myocardial infarction, percutaneous coronary angioplasty and after cardiac surgery interventions. The main purpose of physiotherapy following cardiac surgery is known to prevent and treat postoperative complications, improve pulmonary function and promote physical activity. [17]

In-patient cardiac rehabilitation consists of variety of techniques, the most common being deep breathing exercise, supported cough/huff and limb exercises. [18] Breathing exercises are thought to improve ventilation distribution, improves oxygen transport in the brain which influences

parasympathetic nervous system which lowers blood pressure and heart rate, reduces levels of stress hormones in the blood, reduces lactic acid build-up in muscle tissue, balances levels of oxygen and carbon dioxide in the blood, improves immune system functioning, increases physical energy ,increases feelings of calm and wellbeing. [17] The impact of exercise and multifactorial cardiac rehabilitation on improving psychological factors has been shown in a recent study where there was a marked improvements in the levels of anxiety, and overall quality of life after cardiac rehabilitation and exercise training programs. [8] Early ambulation elicits cardiopulmonary and cardiovascular responses resulting in an enhancement of oxygen transport and blood supply to the brain, it influences hypothalamus pituitary adrenal axis (HPA) in which pituitary releases hormone beta-endorphins in peripheral and central nervous system. These beta-endorphins bind to opioid receptors and exert primary action at presynaptic nerve terminals, inhibiting release of GABA resulting in excess production of dopamine. Dopamine is associated in relieving anxiety. [19] But it is still unclear which treatment techniques are the most effective. Early mobilization and physical activity is often the first choice of treatment, but evidence as to the optimal intensity, timing and choice of exercises is scarce.

It has been found that coronary patients who adhered to a cardiac rehabilitation program were more self-motivated than those who did not adhere to the program, [20] a finding consistent with other studies. [21] Exercises relieve patient symptoms, increases self confidence which increases patients’ belief towards positive impact of exercise and promotes physical activity. In-patient cardiac rehabilitation post operatively would have resulted in a feeling of well being and confidence in patients indicated by reduced scores of kinesiophobia and fear avoidance belief measured at the time of discharge from

hospital. Thus for a clinician it is very important to assess kinesiophobia and fear level in cardiac patients which will help them to set appropriate goals for cardiac rehabilitation. The study however had few limitations in the form of small sample size and inability to assess long term effects of cardiac rehabilitation on kinesiophobia and fear avoidance belief levels

## CONCLUSION

In-patient cardiac rehabilitation helps in reducing Fear avoidance belief (physical activity) and kinesiophobia in patients post cardiac surgery. Findings of this study can be used to formulate patient specific rehabilitation goals by implementing counseling and physical activity as a part of cardiac rehabilitation program.

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**Conflict of Interest-** Nil

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