

ROLE OF PSYCHOLOGICAL STRESS AND PHYSICAL INACTIVITY AMONG PATIENTS OF ISCHEMIC HEART DISEASE IN RAWALPINDI

Farhana Haseeb, Farrah Pervaiz*, Shazeena Zafar, Naila Azam, Humaira Mahmood, Rizwana Anwar**

Armed Forces Post Graduate Medical Institute/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Armed Forces Institute of Cardiology/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, **Islamia University Islamabad Pakistan

ABSTRACT

Background: Globally cardiovascular diseases (CVDs) especially ischemic heart disease (IHD) became the largest menace and still considering as the most common cause of death. Psychological stress and physical inactivity are the two important risk factors for IHD, but still little is known regarding their actual frequency in Pakistan.

Objective: To determine the frequency of psychological stress and physical inactivity among patients of ischemic heart disease in Rawalpindi.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: Study is conducted in Armed Forces Institute of Cardiology (AFIC) and Rawalpindi Institute of Cardiology (RIC) Rawalpindi Pakistan, from Apr to Oct 2018.

Material and Methods: For the present study 200 known patients of IHD have been selected through non probability consecutive sampling, between 20 to 60 years of age, having ejection fraction 30-60% from OPDs of above two selected hospitals. Self-administered General Health Questionnaire (GHQ-12) is used to assess the psychological stress level and World Health Organization Disability Assessment Schedule (WHO DAS 2.0) is used to assess physical inactivity status of IHD patients.

Results: According to standard cut-offs of GHQ-12 results, 28 (13%) respondents rated as normal (no stress), 18 (10%) having minimal stress, 84 (42%) rated as having moderate level of mental stress, while 70 (35%) were showed severe psychological stress, the total frequency of psychological stress in IHD patient is revealed as 82%.

A considerable association has been found between psychological stress and physical inactivity in ischemic heart disease patients showing the p -value ($p=0.043$). On the basis of standard cut offs of WHO DAS 2.0 questionnaire, 142 (71%) were found having moderate physical inactivity and 42 (21%) were rated in severe category, only 16 (8%) rated in normal category. Total frequency of physical inactivity in IHD patients revealed as 92%. By comparing results of two, a significant association between the physical inactivity and psychological stress ($p=0.009$) has been found.

Conclusion: The present study is showing significant association between psychological stress and physical inactivity in patients of ischemic heart disease. It is a starting point leading to awareness, discussion and action for government, physicians, patients and all stakeholders.

Keywords: Frequency, General health questionnaire, Ischemic heart disease, Psychological stress, Physical inactivity, World health organization disability assessment schedule.

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INTRODUCTION

Globally Cardiovascular Diseases (CVDs) are still considered as the leading cause of death and also one of the main barrier to sustainable global health¹. The third Sustainable Development Goal (SDG) has revealed the importance of cardiovascular disease by targeting the one third reduction in the premature mortality rate due to

non-communicable diseases (NCDs)². Countries that revealed SDG goals truly, have focusing their abilities to improve the health care and to limit or reduce the risks for cardiovascular especially ischemic heart diseases³.

Ischemic heart disease (IHD), also called coronary heart disease (CHD) or coronary artery disease (CAD), is defined as the state in which blood supply to the heart is decreased by the narrowing of heart (coronary) arteries whose supply the blood to the heart (cardiac) muscles⁴.

Correspondence: Dr Farhana Haseeb, Armed Forces Post Graduate Medical Institute Rawalpindi Pakistan
Email: farhanahaseeb123@gmail.com

Even though the narrowing has been produced either by a blood clot or by the constriction of the coronary artery, mostly it is due to formation of plaque, called atherosclerosis.

Ischemia is defined as an insufficient blood supply (circulation) to any local area due to the blockage of the blood vessels supplying that area. Ischemic means that an organ (e.g, the heart) is not receiving enough blood and oxygen which is vital for its normal functioning. When the blood

7.4 million people died because of CAD and 6.7 million people from stroke. It is estimated that almost 90% of cardiovascular diseases are preventable by inhibiting the atherosclerosis⁷.

Cardiovascular disease events and the emotional disorders share a similar epidemiology, hence proposing the fundamental pathways for associating these different diseases⁸. Growing evidence in the literature highlights has revealed influence of the psychological determinants in

Table-I. General Health Questionnaire.

S. No	Variable	n (%)			
		Not at all	Not more than usual	More than usual	More than very usual
1	Less Sleep	39(19.5)	80(40.0)	69(34.5)	12(6.0)
2	Constant Pressure	26(13.0)	94(47.0)	65(32.5)	15(7.5)
3	Full Concentration	15(7.5)	70(35.0)	88(44.0)	27(13.5)
4	Useful Character	15(7.5)	89(44.5)	61(30.5)	35(17.5)
5	Face The Problems	32(16.0)	63(31.5)	63(31.5)	41(20.5)
6	Decision Power	24(12.0)	84(42.0)	64(32.0)	27(13.5)
7	Solve The Problems	30(15.0)	66(33.0)	87(43.5)	17(8.5)
8	Feeling Happy	10(5.0)	87(43.5)	68(34.0)	35(17.5)
9	Enjoying The Routine	15(7.5)	103(51.5)	68(34.0)	14(7.0)
10	Feeling Sad	22(11.0)	110(55.0)	50(25.0)	17(8.5)
11	Lack Of Confidence	44(22.0)	88(44.0)	60(30.0)	8(4.0)
12	Feeling Useless	96(48.0)	70(35.0)	25(12.5)	9(4.5)

Table-II: Frequency of psychological stress in patients of ischemic heart disease GHQ cut offs.

Normal	28 (13%)
Minimum	18 (10%)
Moderate	84 (42%)
Severe	70 (35%)

flow to the heart muscle is completely blocked, the heart muscle cells die, which is named as heart attack or myocardial infarction (MI)⁵.

As the atherosclerosis progresses, and also has not treated properly, then symptoms might appear. This will increase the workload and the oxygen demand of the cardiac muscles⁶.

According to WHO (2014), Ischemic Heart Disease is amongst the topmost killers during the past span. Cardiovascular diseases have killed almost 17.5 million people in 2012 that is supposed as 3 in every 10 deaths. Out of these,

somatic diseases. A patient's socio-economic aspects, his/her personality traits, health behaviour and even biological pathways may contribute to the course of cardiovascular events⁹.

Mental health is considered as the fundamental basis of the mental, physical and social wellbeing of a person, which is vital for the effective functioning at both individual and the community levels¹⁰. Surprisingly, there are well defined connections between the mental stress, physical inactivity & cardiovascular diseases. There is a greater risk of evolving atherosclerosis with the chronic stressful conditions, resulting in

a cardiac uncertainty and also increased chances of the myocardial ischemic event^{11,12}.

A recent study published in “The Lancet” had reported that the amygdala, an almond shaped portion of the brain located in temporal lobe which is involved in mental stress and has been associated with the post-traumatic stress disorder (PTSD) or with depression and anxiety. Its activity has amplified when it receive stress signals, which leads to a larger risk of developing cardiovascular diseases^{13,14}. This might cause an increase in the secretion of the glucocorticoids, catechol amines, and the inflammatory cytokines. Those conditions which can permit the rise

activity protects from the cardiovascular disease and the risk of early dying. Moreover, it helps in psychological stress improvement and helps an individual to feel and look better^{20,21}.

MATERIAL AND METHODS

A descriptive cross sectional study has been conducted from Apr to Oct 2018, in two hospitals, Rawalpindi Institute of Cardiology and Armed Forces Institute of Cardiology in Rawalpindi, Pakistan. For the study, a selected sample of 200 known patients of ischemic heart disease between the ages of 20 to 60 years of age, having ejection fraction 30-60% have been taken from OPDs of these hospitals, through Non probability

Table-III: Association between GHQ and DAS 2.0.

	Normal	Minimum	Moderate	Severe	
Normal	4 (25)	2 (13)	6 (37)	4 (25)	0.009
Moderate	22 (16)	14 (10)	62 (44)	42 (30)	
Severe	0 (0)	4 (10)	13 (32)	24 (59)	

in Stress related cardiovascular disease events initiate with the stimulation of both the sympathetic nervous system and hypothalamus pituitary adrenal axis (HPA) the heart rate and also blood pressure, those would ultimately contribute to the dysfunction of the endothelium of blood vessels. In patients of ischemic heart disease, psychological stress is a well-defined provocateur of the ischemia¹⁵.

Physical activity (PA) buffers the association between psychological stress and the physical health problems. Physical exercise is effective for treating both CVD & Mental stress¹⁶. Approximately 3.2 million people die each year due to physical inactivity (WHO 2008). Indeed psychosocial stress also provides an independent contribution to ischemic heart disease endings. It is recently discovered that exercise had a stronger effect than anticoagulants & antiplatelet in the treatment course of cardiovascular diseases^{17,18}.

The physical inactivity is considered as an independent risk factor for coronary artery disease. It works through its decreasing effects on heart rate, blood pressure, cholesterol, obesity and glucose levels in blood¹⁹. Regular physical

consecutive sampling technique. After taking informed consent, data has been collected with help of two questionnaires.

A. General Health Questionnaire (GHQ-12) was used to assess psychological stress levels in patients of ischemic heart disease.

B. World Health Organization-Disability Assessment Schedule (WHO DAS-2.0) questionnaire was used to assess the physical inactivity level in patients of ischemic heart disease.

All collected data has been analyzed by using statistical Package of Social Sciences (SPSS) version 21. Descriptive data on numerical variables was analyzed through mean and standard deviation (SD) while categorical results were analyzed in the form of frequencies and percentages and association of variables with GHQ-12 and WHO DAS 2.0 were observed by chi square test. A *p*-value of <0.05 was considered significant.

RESULTS

General Health Questionnaire Scoring

In GHQ-12, each item on the scale has four responses from “better than usual” to “much less

than usual.” For the purpose of this study, the GHQ scoring done by simple Likert scale of 0-1-2-3 is used and analyzed after summing up all responses. According to the standard cut-off point 5-6 considered as normal or having no psychological stress. Score upto 11-12 consider as having Minimal and score >15 is evident of moderate mental or psychological stress, while showing the score >20 suggests severe psychological stress.

Table-II. To achieve the objective 1, cut off points of GHQ-12 have been taken. The results were showed that out of total, 28 (13%) respondents were reported to be in normal category, means have no psychological stress. 18 (10%) in minimal category, 84 (42%) in moderate category and 70 (35%) respondents fall in in severe category showing high mental stress or psychological problems. Total frequency of psychological stress in IHD patients is revealed as 82% overall.

Association Between Psychological Stress and Physical Inactivity

Above figure is showing statistically significant association between psychological stress and physical inactivity with *p*-value (*p*=0.043) It also showing that the patient have physical health problems due to psychological or mental stress.

Table-III. For achieving our objective 2, an association between psychological stress and physical inactivity, compared the GHQ-12 and WHO DAS 2.0, a significant association have been showed by comparing these two results (*p*=0.009).

DISCUSSION

This present study aimed to assess the frequency of psychological stress and physical inactivity in patients of Ischemic heart disease, with a view to examine the psychological stress affecting the physical health of ischemic heart disease patients.

To achieve the objective of the study 1, GHQ-12 results have been analyzed, which cut off values showed 28 (13%) respondents rated as

normal (no stress), 18 (10%) having minimal stress, 84 (42%) rated as having moderate level of mental stress, while 70 (35%) were showed severe psychological problems or mental stress. Total frequency of psychological stress is revealed 82% overall. A significant association has been found between psychological stress and physical inactivity in ischemic heart disease patients having the *p*-value (*p*=0.043). Our study can be compared with a prospective study reported in BMC Medical Education Research article has

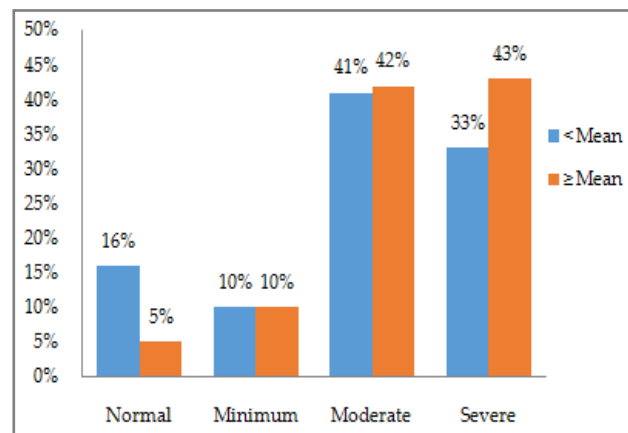


Figure: Association between psychological stress and physical inactivity.

done in Dec 2006 in Nepal, by using GHQ-12, to assess the knowledge regarding the mental stress involved in the student medical college, in Pokhara, Nepal. The overall prevalence rate for psychological morbidity revealed as 20.9% which was significantly high and associated with occurrence of academic and health related stressors²².

Another study has been done in Karachi, Pakistan, to evaluate the prevalence of depression, anxiety and their associated risk factors, among the students of a medical college. This study has also used a self-administered General Health questionnaire (GHQ-12). Primary outcome was anxiety and depression which was revealed as a cut off value of 19. The mean (SD) age of the students was 21.3 (1.88) years. A very high prevalence of anxiety and depression (70%) was found among students²³.

US Surgeon General report, which revealed that the regular physical activity has decreased the risk of coronary artery disease. Recently published articles, showing the meta-analysis of the prospective cohort studies discovered that the good quality of relaxation time physical activity decreases the risk of coronary heart disease and stroke events in both men with (RR 0.76 95 % CI 0.70–0.82) and women (RR= 0.83, 95 % CI 0.67–1.03) showing ($p=0.008$). This analysis can be compared with our study, which revealed a considerable association between the psychological stress and physical inactivity with p -value ($p=0.043$) among the patients of ischemic heart disease²⁴.

A study done in Finland in 2012, published in a journal of obesity society. In this study DAS 2.0 questionnaire is used to assess the role of obesity in physical inactivity. According to this study the role of physical inactivity in adults is strongly and independently cause the obesity which is also risk factor for CAD. Odd ratio 3.9%, 95% of confidence interval (CI) 1.4-10.9 at adult age²⁵.

Another study has been done in a tertiary-care hospital in Japan between Apr to Sep 2016, on the patients aged 50-60 years of age and were scheduled to undergo cardiac surgery. WHO DAS-2.0 Questionnaire is used to evaluate the physical condition of the patients. Out of 912 (75.9%) which were included in the study, the prevalence of preoperative functional disability was 29.2%²⁶.

In comparison with present study results of WHO DAS-2.0, which showed total frequency of physical inactivity in ischemic heart disease patients 92%, out of which 142 (71%) were found having moderate physical inactivity and 42 (21%) were rated in severe category. The comparison of GHQ-12 and DAS 2.0 has revealed strong association between psychological stress and physical inactivity ($p=0.009$). Application of GHQ-12 and WHO DAS 2.0 had not been much found in Cardiology institutes of Rawalpindi, Pakistan.

CONCLUSION

The present study is showing significant association between psychological stress and physical inactivity. It also revealed a high level of mental and physical pressures among the patients of ischemic heart disease in both male and female. The present study will provide an insight on the burden of ischemic heart disease and the psychological and physical health problems of patients of ischemic heart disease which will help policy makers and the concerned stake holders to plan appropriate interventions accordingly. It is a starting point leading to awareness, discussion and action by the government health department, patients and the physicians. There is a robust need of healthy life style modification, behavioral activation techniques and preventive measures to reduce the mental stress and to increase physical activity in our population of Pakistan.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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