Effect of calisthenics on stress of individuals diagnosed with Coronary Artery Disease

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Abstract: Cardiovascular diseases constitute a leading cause of death under Non Communicable diseases, among them Coronary artery diseases are the commonest one. The objectives of the study were to determine the level of stress of individuals diagnosed with CAD as measured by Rating Scale for Stress, to evaluate the effect of Calisthenics on stress of individuals diagnosed with CAD and to find out the relationship between the stress of individuals diagnosed with CAD and socio-demographic and clinical proforma. A quantitative approach with one group pretest-posttest experimental research design was used with a sample size of 50 and they were selected using non-probability purposive sampling technique. A pretest was conducted using Rating Scale for Stress and intervention was taught and practice dairy was provided to the participants who met inclusion criteria. On the 15th-day post-test was conducted with the same tool. Results showed the pretest mean stress score was 2.38 whereas posttest mean stress score was 1.72. The mean difference of pre to posttest level of stress after the intervention was .6600, with a t value 8.374, and p-value of 0.000which was statistically significant, which means there is a significant reduction in the stress level after the intervention.

Index Terms: Coronary Artery Disease; Calisthenics; Stress; Rating scale for stress.

INTRODUCTION

"Health is a state of complete physical, mental and social well-being and not merely absence of any diseases or infirmity"-WHO[1].In humans disease can occur due to physical, mental, or psychosocial disturbances. Individuals consult doctors for a wide range of disease. Among them the most common non communicable disease prevailing in the modern era is Coronary artery disease. Coronary artery disease (CAD) is the foremost cause of disability and death all over the world and is one of the top five causes of death in Indian population. Mortality from CAD in Indians is predicted to increase rapidly and overtake that of the high-income countries[2]. In our daily day today life we experience stress. The relationship between stress, heart disease, and sudden death has been recognized since antiquity. Stress can contributes to coronary disease by smoking and other lifestyles or because of dangerous traits like excess anger, hostility, aggressiveness, time urgency and inappropriate competitiveness[3.] Being a Nurse we need to make concentrated effort to decrease stress in order to attain a better quality of life. While experiencing stress the hormones released can stay in blood for a while and prevent the individual from relaxing, sleeping, and enjoying life. The stress hormones also decrease the immunity, making us more susceptible to diseases; it will also cause lethal effects by increasing blood pressure, cholesterol levels and blood's susceptibility to clotting[4].

Day in and day out stress can be very harmful to our body; therefore we need to make concentrated effort to decrease stress in order to attain a better quality of life. Experts agree that one best way to manage stress is through exercises, exercises have been proven to relax body and mind. One of such exercise is calisthenics exercise. Calisthenics exercises are intended to increase body strength and flexibility; lethal effect of stress also has shown to raise blood pressure, cholesterol levels, and blood's susceptibility to clotting. These exercises have been known to improve mental health, which in turn helps in treating depression, stress and anxiety[5].

STATEMENT OF THE PROBLEM:

A study to assess the effect of calisthenics on stress of individuals diagnosed with Coronary artery disease in a selected hospital, Kozhikode".

OBJECTIVES:

- Determine the level of stress of individuals diagnosed with CAD as measured by Rating Scale for Stress.
- Evaluate the effect of Calisthenics on the stress of individuals diagnosed with CAD.
- Find out the relationship between the stress of individuals diagnosed with CAD and selected socio-demographic and clinical variables.
- Find out the association between the stress of individuals diagnosed with CAD and selected socio demographic and clinical variables.

ASSUMPTION:

- CAD is a common disease of young and late adulthood.
- An individual with CAD is vulnerable to complications such as MI.
- Lifestyle modifications can delay the progression of CAD.

HYPOTHESIS:

H1: There will be a significant difference in the pre and posttest level of stress after intervention with calisthenics.
H2: There will be a significant relationship between the stress and selected sociodemographic & and clinical variables.
H3: There will be a significant association between the stress and selected sociodemographic & clinical variables.

MATERIALS AND METHODS

The study was conducted in Aster MIMS Hospitals; Kozhikode. The research approach adopted was quantitative and the research design was one group pre-test post-test quasi-experimental design. As per the inclusion criteria, 50 sample were selected by purposive sampling. The tool 1consists of semi structured questionnaire which consist of section A socio demographic data and section B Clinical variables. Tool 2 consist of Rating scale for Stress This rating scale for stress consists of 10 items in which items 1,3,4,6,7,8,9,10 are scored as 0,1,2,3,4 which indicates never, almost never, sometimes, fairly often, very often and 2nd and 5th item is scored as 4,3,2,1,0 that is reverse scoring. The maximum score was 40. A total score of 31 and above indicated severe stress, a score between 21-30 indicated moderate stress, a score between 11-20 indicated mild stress and a score below 10 indicated normal stress. The reliability of the Rating scale for stress was tested by Cronbach's alpha and was found to be 0.704. Ethical clearance was obtained from institutional ethics committee (Aster MIMS, Kozhikode) and approval from Kerala University of Health Sciences, Thrissur. Prior to data collection permission was obtained from the head of Cardiology department Aster MIMS, Kozhikode. Informed consent was obtained from the participants and confidentiality of data was ensured to the sample under study. The study was registered in CTRI (Ref No: REF/2018/03/018350). A pilot study was conducted among 10 individuals diagnosed with CAD, who met the inclusion criteria using the prepared tools. The objective was to assess the feasibility of the study. The data collected were amenable to statistical analysis. The pilot study revealed that the tools used in the study were simple, clear and unambiguous. The main study was conducted among the 50 individuals diagnosed with CAD who met the inclusion criteria. Duration of data collection process was 6 weeks. The sample were selected using purposive sampling technique. A good rapport was established with the participants and relatives and the purpose of the study was explained to them and the doubts were cleared. At first Rating Scale for Stress were administered to the sample and after that the stress level was calculated and the purpose of the study was explained to individuals with mild, moderate, severe stress. After that informed consent was taken; socio-demographic and clinical variables were obtained. Calisthenics was taught and practice dairy was given to them to continue Calisthenics for 15 days. On the 15th day of the intervention, a post-test was conducted. The data were subjected to statistical analysis.

RESULTS

Distribution of socio-demographic variables of the sample based on age, religion, marital status, and educational status, the type of family, Occupation, monthly income and breadwinner of the family.

It shows that most of the subjects (50%) belong to the age group of 60-70 years. Fifty-two percentage of sample belongs to the Christian religion. Majority of the sample were married (86%) and 44% of the sample has only primary educational status. Majority (92%) of the individuals belongs to the nuclear family. Most (40%) of the individuals were unemployed. Fifty-eight percent of the individuals have a monthly income of less than 10,000 rupees. Fifty-two percent of the individuals are taking care of their family by themselves.

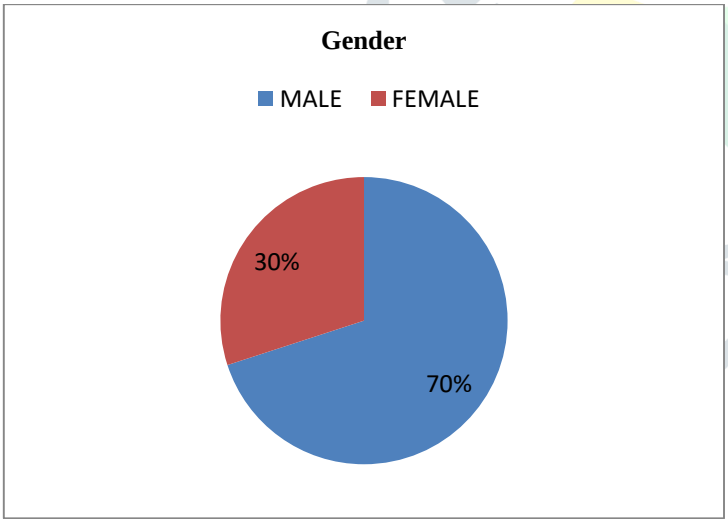

Figure 1: Distribution of sample based on gender.

The figure 1 shows 70% of the sample were male and 30% of the sample were females.

Distribution of clinical variables of the sample based on duration of illness, Habits, BMI, family history.

The data collected from 50 sample represents that 52% of the sample had the duration of disease between 3 years to 15 years. A majority (92%) of the sample don't have unhealthy habits. Most (74%) of the sample have normal Body Mass Index of 18.6-24.9. Seventy-four percent of the sample doesn't have a family history of Coronary Artery Disease. 74% of the sample had no regular exercise habit.

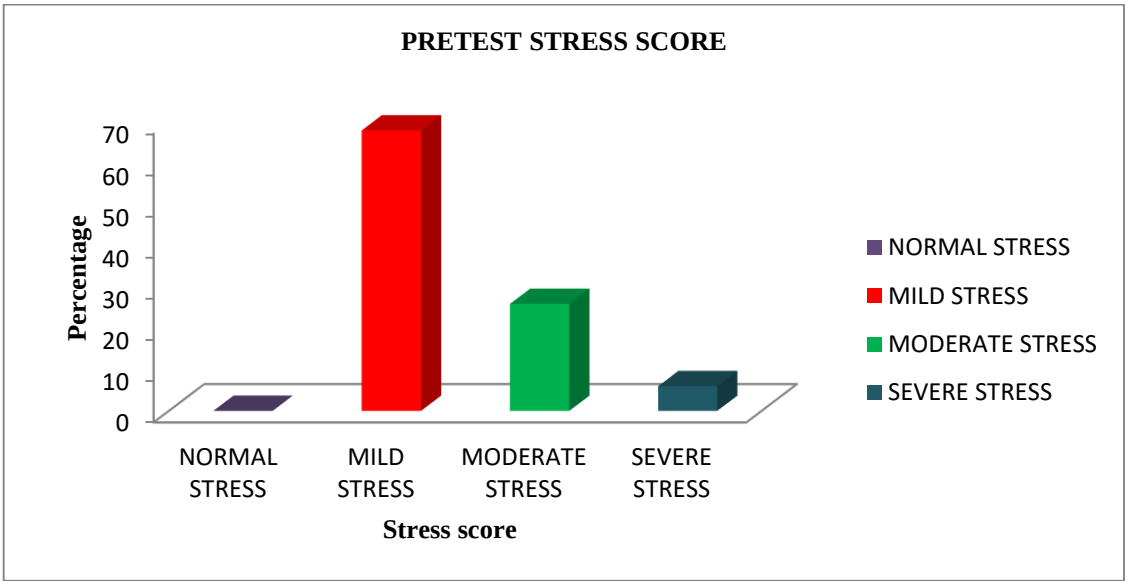

Figure 2: Distribution of pretest stress scores

Data depicted in figure2 shows that majority (68%) of the subjects were suffering from mild level of stress and 26% of the sample had moderate stress and only 6% of the sample had severe stress.

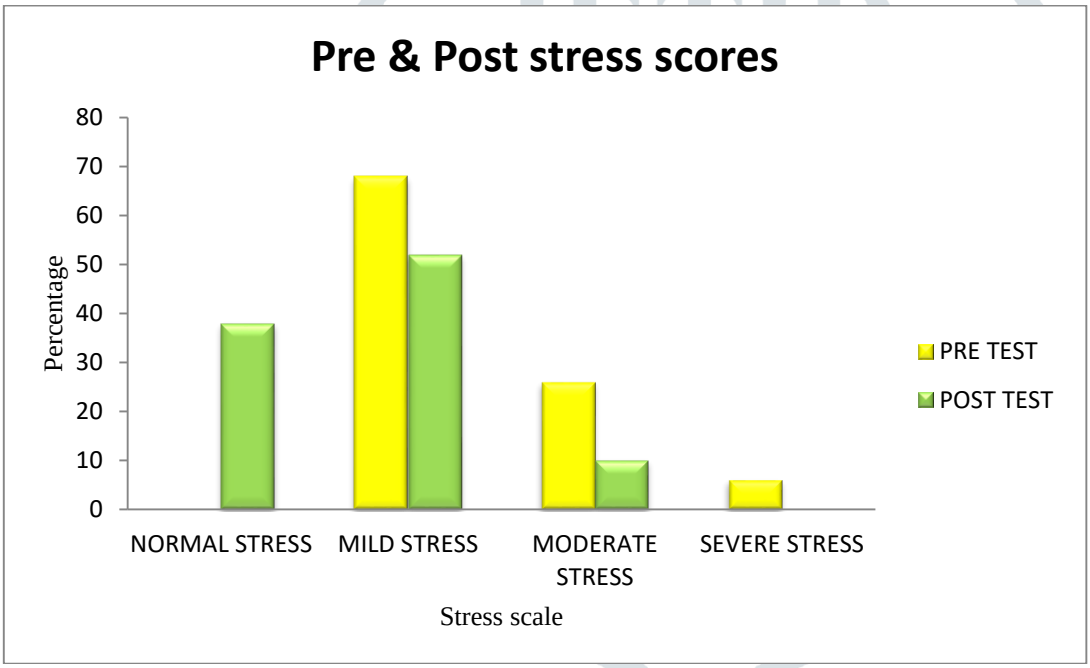

Figure 3: Percentage distribution of Stress score of the sample before and after the intervention of Calisthenics.

The above bar graph shows the pretest and posttest of stress scores. In the pretest assessment majority (68%) of the sample had mild stress, 26% of the sample had moderate stress and 6% had severe stress. In posttest assessment 38% of the sample had normal stress, 52% of the people had mild stress and 10% of the sample had moderate stress and none of them had severe stress.

Table 1: Effect of Calisthenics on the stress level of individuals diagnosed with CAD

n=50

	Mean	Mean Difference	95%confidence interval of the difference		Standard deviation	t Value	df	pvalue
			Lower limit	Upper limit				
Pretest	2.38				0.6023			
		0.6600	0.50161	0.81839		8.374	49	0.000
Posttest	1.72				0.64015			

(*p<0.05 level of significance)

Table 1 show that there is a reduction in stress scores by posttest. The paired 't' test comparison showed a significant reduction in stress scores during pretest and posttest (t (49) =8.374, p<.000) with a mean difference of 0.6600. This result shows that calisthenics exercise was effective in reducing stress in CAD patients.

Table 2: Correlation between pretest stress score and age, monthly income, duration of illness, BMI.

n=50

Variables	Pretest stress score	
	r	p
Age	-0.010	0.943
Monthly income	0.126	0.383
Duration of illness	-0.08	0.55
BMI	-0.10	0.479
The breadwinner of the family	0.160	0.268

(*p<0.05 level of significance)

Findings from table 2 shows that there is a negative correlation with pretest stress score and age (r=-.010, p=.943). Also, there is a negative correlation between pretest stress score and duration of illness and BMI. From the findings, it is clear that there is no significant relationship existing between pretest stress score and monthly income. There is no relationship between pretest stress score and breadwinner of the family.

Table 3: Association between pretest stress scores and selected variables (age, gender, religion, occupation)

n=50

Variables	Pretest score			Chi-square value	df	p value
	Mild	Moderate	Severe			
Age						
a) 40-49	3	2	0			
b) 50-59	14	5	1	0.982	4	0.913
c) 60-70	17	6	2			
Gender						
a) Male	26	8	1			
				3.042	2	0.219
b) Female	8	5	2			

Religion						
a) Hindu	16	4	0	4.134	4	0.388
b) Christian	15	8	3			
c) Muslim	3	1	0			
Occupation						
a) Private	3	2	0	5.400	6	0.494
b) Self employed	13	4	0			
c) Unemployed	12	5	3			
d) Retired	6	2	0			

(*p< 0.05 level of significance)

Data in table 3 reveals that selected variables are not associated with the level of stress of individuals diagnosed with CAD.

Table 4: Association between pretest stress scores and selected variables (Educational status, type of family, Monthly income, Duration of illness, Habits)

n=50

Variables	Pretest score			Chi-square value	df	p value
	Mild	Moderate	Severe			
Educational status						
a) No formal education	1	0	0	6.694	8	0.570
b) Primary	16	4	2			
c) Secondary	13	6	0			
d) High school	2	1	1			
e) UG & higher	2	2	0			
Type of Family						
a) Nuclear	33	12	1	15.231	2	0.000
b) Joint	1	1	2			
Monthly income						
a) Below 10,000	19	8	2	1.788	8	0.987
b) 10,000-20,000	7	3	1			
c) 20,001-30,000	5	1	0			
d) 30,001-40,000	2	1	0			
e) 40,001-50,000	1	0	0			
Family History						
a) Present	10	3	0	1.317	2	0.518
b) Absent	24	10	3			

(*p< 0.05 level of significance)

Data in the table 4 reveals that type of family has got association with the level of stress of individuals diagnosed with CAD.

Table 5: Association between pretest stress scores and selected variables (duration of illness and habits)

n=50

Variables	Pretest score			Chi-square value	df	p value
	Mild	Moderate	Severe			
Duration of illness						
a) <one year	5	3	1	6.313	10	0.788
b) 1.1years -2 years	5	2	0			
c) 2.1 years -3 years	4	0	0			
d) 3.1 years -5 years	8	3	2			
e) 5.1years -15 years	9	4	0			
f) 15.1years-30years	3	1	0			
Habits						
a) Smoking	2	0	0	17.381	6	0.008
b) Alcohol	1	0	0			
c) Both smoking & alcohol	0	0	1			
d) None	31	13	2			

(*p<0.05 level of significance)

Data in table 5 shows that habits has got association with pretest level of stress of individuals with CAD as it has got p value of 0.008.

DISCUSSION

The findings of the present study showed significant improvement in the stress level of the sample by undergoing calisthenics exercise. The mean difference from pre to posttest level of stress after the intervention was .6600, with a t value 8.374, and p-value is 0.000.

The findings in a similar study done in the year 2001 by Elisabeth Preisinger et.al on the topic to assess the long-term effects of calisthenics home exercises on the incidence of fractures in postmenopausal women showed that, after a follow-up of 73 women in the exercise group and 64 subjects of the control group, thirty-three per cent of the exercise group reported to have exercised continuously at least three times a week for 20 min. No intergroup differences were reported between the compliant and non-compliant exercisers. The incidence of fracture was lowest in women with experimental group[6].

CONCLUSION

Nurses have an important role in management of patients with stress. Different types of exercises have beneficial effects on stress. Calisthenics exercises are one way to relieve stress of patients with CAD. The present study evaluated the effectiveness of Calisthenics on stress of individuals diagnosed with CAD. The exercise programme found to be effective in reducing stress. The findings show that this exercise program can be included in stress management of CAD patients.

REFERENCES

1. World Health Organization. Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. In International Health Conference, New York 1946 Jun (pp. 19-22).
2. Gupta R, Joshi P, Mohan V, Reddy KS, Yusuf S. Epidemiology and causation of coronary heart disease and stroke in India. Heart. 2008 Jan 1; 94(1):16-26.
3. Marksberry K. Stress and Heart Disease [Internet]. The American Institute ofStress. [cited 29 June 2018]. Available from: https://www.stress.org/stress-andheart-disease.
4. Bradshaw, A. Definition of Stress [Internet]. The Stress Site. 2017: https://www. the-stress-site.net/definition-of-stress.html
5. http://en.wikipedia.org/wiki/calisthenics.
6. Preisinger E, Kerschan-Schindl K, Wöber C, Kollmitzer J, Ebenbichler G, Hamwi A, Bieglmayer C, Kaider A. The effect of calisthenic home exercises on postmenopausal fractures—a long-term observational study. Maturitas. 2001 Oct 31;40(1):61-7.