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Original Research Article

Back Massage on Physiological Parameters among Cardiovascular Patients

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Abstract: Cardiovascular disease (CVD) is a major cause of mortality and morbidity worldwide. It could cause undesirable physiological changes and leads to life threatening complications. Although pharmacological therapy is the main part of the treatment in cardiovascular diseases, considering the high prevalence of their side effects, most researchers would recommend non-pharmacological methods. Hence the study was conducted with the aim to assess the effectiveness of back massage on physiological parameters among cardiovascular patient. Quasi-experimental research design was employed with 30 samples who matched the inclusion criteria were selected by non-probability convenience sampling technique. Demographic variables were collected by multiples choice questionnaires followed by pre-test was done for both experimental and control group. Experimental group received lavender oil back massage twice a day for five days. Control group received routine care. At the end of fifth day post- test was done for both experimental and control group. The data were tabulated and analysed by descriptive and inferential statistics. The result of the study reveals that there is a significant reduction in heart and systolic blood pressure at the level of $p<0.05$. The finding of the study concluded that back massage is a simple, safe, non- pharmacological and cost effective method in reducing the heart rate and systolic blood pressure among patients with cardiovascular disease.

Keywords: back massage, blood pressure, cardiovascular patient, heart rate, physiological parameters.

INTRODUCTION:

Cardiovascular diseases (CVD) are conditions affecting the heart and blood vessels which includes coronary artery disease, congestive heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmias, congenital heart diseases, peripheral artery disease and venous thrombosis. Cardiovascular disease (CVD) is a major cause of mortality and morbidity worldwide. An estimated 17.9 million people died from CVDs representing 31% of all global deaths. Of these deaths, 85% are due to heart attack and stroke and more than 75% CVDs deaths occurs in low and middle income countries (https://www.who.in).

Cardiovascular diseases could cause undesirable physiological changes and leads to life threatening complications. Cardiovascular system is one of the most sensitive systems in the body which would experience immediate changes in heart rate and ventricular pressure after environmental and emotional changes such as tension and stress (Babaee, S. *et al.*, 2012). Hospitalization for cardiovascular disorders itself could be stressful which again aggravate the changes in the physiological indices such as increased heart rate, increased respiratory rate, increased blood pressure, and decreased oxygen saturation (Jariani, M. *et al.*, 2011). The need for myocardial oxygen demand would be increased and hence diastolic systolic ratio would be shortened due to increased heart rate consequently, the entire circulation would be decreased, (Mohammadi, F. *et al.*, 2009) which would intensify ischemic processes and myocardial necrosis (Taghizadeh, P. *et al.*, 2013). Therefore, patients with cardiovascular disorders must be hospitalized to receive the most desirable quality care with respect to physiological indices and controlling vital signs. Although medicinal therapy is the main part of the treatment in cardiovascular diseases, considering the high prevalence of their side effects, most researchers

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would recommend non-medicinal methods (Tate, J.A. 2010). There are several methods, including complementary and alternative medicine which could use to help improve their patients' health (Mohammadpur, A. *et al.*, 2014). Music therapy, touch therapy, and massage therapy are some of the methods that could be used for controlling hemodynamic condition.

The use of back massage could be effective in reducing blood pressure and this method is easily available and would be more effective compared to medications reduce the risk of side effects of medication. Considering the pathophysiology of blood pressure and the effective mechanism of massage therapy, relaxation through massage can facilitate the response of parasympathetic nerve, thus reducing heart rate, blood pressure and anxiety (Moyer, C.A. *et al.*, 2004). Repeated sensory stimulation during massage could result in neural changes and automatic system activity and consequently could cause changes in blood pressure and heart rate within normal physiological range (Aourell, M. *et al.*, 2005). During repeated sensory stimulation by massage, changes in neural cycles cause a variable activity in the autonomic nervous system, such as the BP regulation system (Mense, S. 1983). Systolic BP increases during acute stress, while diastolic BP increases only after long-term stress. Reduction of diastolic BP over time can be due to continuous sensory stimulation (Verdecchia, P. *et al.*, 1999). Massage therapy improves general blood flow and alleviates muscle soreness by improving vascular function (Franklin, N. C. *et al.*, 2014). The benefits of back manage can reduce stress, increase production of endorphins (The body natural painkillers) improve blood circulation, reduce blood pressure and slow heart rule act benefits that can contribute to heart health. Manage improving circulation towards the heart while relaxing contracted muscles it improve circulation of oxygen and essential nutrient in the body by strengthening circulation. Considering the potential benefits, reviewing the literature of supportive studies, the study was conducted with the aim to determine the effectiveness of back massage on physiological parameters among cardiovascular patients.

MATERIALS AND METHODS

The research approach adopted in this study was quantitative approach by using quasi experimental research design. After obtaining formal permission from head of the cardiology ward of selected hospital with 30 samples. Samples met the inclusion criteria were selected by using non-probability convenience sampling technique and allocated into experimental and control group. Sample who do not understand tamil or english, mentally & critically ill, contraindicated to back massage were excluded from the study. The participants who met the inclusion criteria such as hypertension, NYH classification I-IV, hemodynamically stable and consented for willing to participate in the study were informed about purpose of the study. Demographical variables were collected by using multiple choice questionnaire followed by pre-test was conducted for both experimental and control group. The main outcome of the study was blood pressure and heart rate. Back massage was given by using lavender oil twice a day for five days whereas control group received routine care of the hospital. Heart rate and blood pressure was checked 10 minutes before and after the intervention and an average was taken for analysis. Post-test was conducted at the end of fifth day for control group. The data were tabulated and analyzed by descriptive and inferential statistics.

RESULTS

Table 1: Frequency and percentage distribution of demographic variables of cardiovascular patient

S.No	Demographic variables	Experimental group		Control Group	
		Frequency	Percentage	Frequency	Percentage
1	**Age in years**				
	a) 40- 50	5	33.33%	4	26.67%
	b) 51- 60	2	13.33%	4	26.67%
	c) 61- 70	7	46.67%	5	33.33%
	d) Above 71	1	6.67%	2	13.33%
2	**Sex**				
	a) Female	6	40%	7	46.67%
	b) Male	9	60%	8	53.33%
3	**Education**				
	a)Primary	7	46.67%	8	53.33%
	b)Higher secondary	5	33.33%	4	26.67%
	c)Under graduate	1	6.67%	3	20%
	d)Illiterate	2	13.33%	0	0%
4	**Monthly Income in Rupees**				
	a)<2000	12	80%	10	66.67%
	b) 2001 to 5000	3	20%	5	33.33%

5	**Resident**				
	a)Rural	8	53.33%	7	46.67%
	b)Semi Urban	2	13.33%	2	13.33%
	c)Urban	5	33.33%	6	40%
6	**Employment**				
	a)Employed	4	26.67%	8	53.33%
	b)Retired / Unemployed	11	73.33%	7	46.67%
7	**Duration of Cardiac Disease**				
	a) Less than 6 months	13	86.67%	11	73.33%
	b) More than6 months	2	13.33%	4	26.67%
8	**Types of cardiac disease**				
	a) Hypertensive heart disease	5	33.33%	7	46.67%
	b) Myocardial infarction	3	20%	8	53.33%
	c) Heart failure	6	40%	0	0%
	d) Cardiomyopathy	1	6.67%	0	0%

The above table reveals that majority of them were in the age group of 61-70 years and more or less both the sex are affected equally. Many of them have completed their schooling till primary school and were retired and unemployed. Regarding duration of cardiac disease more than 80% were having the cardiac disease less than six months and the higher incidence of cardiac disease was hypertensive heart disease and myocardial infarction and congestive heart failure in both experimental and control groups.

Table 2: Distribution of Pre-test and Post-test of mean and standard deviation of physiological parameters in experimental and control group

Sl.No	Physiological Parameters	Experimental Group				Control Group			
		Pre-test		Post-test		Pre-test		Post-test	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	Pulse	59.46	54.1	66.4	25.36	65.73	28.5	62.6	17.8
2	Systolic Blood Pressure	118.6	112.5	117.3	17.12	130.6	57.59	120	105
3	Diastolic Blood Pressure	2.8	1	97.33	64	70.6	7.41	5.3	4.5

The above table shows that distribution of pre-test and post-test of mean and standard deviation of physiological parameters. In experimental group, the pre-test mean and standard deviation of pulse, systolic blood pressure and diastolic blood pressure is 59.46 ± 54.1, 118.6 ± 112.5 and 2.8± 1 respectively. The post-test mean and standard deviation of pulse, systolic blood pressure and diastolic blood pressure is 59.46 ± 54.1, 118.6 ± 112.5 and 2.8± 1 respectively In post-test of pulse mean ± SD (66.4± 25.36) systolic blood pressure mean ± SD (117.3± 17.12) diastolic blood pressure mean ± SD (97.33± 64) respectively.

Table 3: Determine the effectiveness of back massage on physiological parameters among cardiovascular patient.

Sl.No	Physiological Parameters	Experimental Group				Paired't test
		Pre Test		Post Test		
		Mean	SD	Mean	SD	
1	Pulse	59.46	54.1	66.4	25.36	t=29.5 df=14 p = 0.05, S*
2	Systolic Blood Pressure	118.6	112.5	117.3	17.12	21.75 df=14 p = 0.05, S*
3	Diastolic Blood Pressure	2.8	1	97.33	64	18.64 df =14 p>0.05, NS

The pre-test and post-test mean value of pulse was compared by paired't' test which is found significant at the level of p< 0.05. Similarly Systolic blood pressure also found significant decrease at the p<0.05. But there was no changes found in the diastolic blood pressure between the pre-test and post-test in the experimental group among cardiovascular patient.

Table-4: Comparison of post-test level of physiological parameters between experimental and control group.

physiological parameters	Experimental Group		Control Group		Unpaired 't' Value
	Mean	S.D	Mean	S.D	
Pulse	66.4	25.36	62.6	17.8	t =13.076 df=14 p = 0.05, S*
Systolic Blood Pressure	117.3	17.12	120	105	t = 11.338 df=14 p = 0.05, S*

*p<0.05, S – Significant

Post-test level of physiological parameters of pulse and systolic blood pressure between the experimental and control group was compared by unpaired 't' test and found statistically significant difference at the level of p<0.05 which shows that there is an difference between the experimental and control groups in the rate of pulse and systolic blood pressure after the back massage with lavender oil.

DISCUSSION

The most important aim of caring patients with cardiovascular disease is to maintain the physiological parameters which would impact on all aspects of life and improve the quality of life. The present study intensively analyzed the effectiveness of complementary medicine such as back massage on physiological parameters especially heart rate, systolic blood pressure and diastolic blood pressure. The finding of the current study reveals that the impact of back massage only on heart rate and systolic blood pressure but there is no significant changes found in the diastolic blood pressure. The reduction of heart rate after the massage may also be related to the anxiolytic and Para sympathomimetic effects of massage (Buttagat, V. *et al.,* 2011; Lindgren, L. *et al.,* 2010). The findings of the present study supported by Safieh Jamali et, al, who found Pulse, systolic blood pressure, diastolic blood pressure were significantly decreased and effective in stabilizing vital signs after the back massage therapy in Congestive Heart Failure patients (Jamali, S. *et al.,* 2016). Similarly present study finding is consistent with the findings of the study conducted by Christin M. Olney, Mohammad Reza Yeganehkhah *et al.,* Moeini *et al.,* Şebnem Çinar *et al.,* and MakNamara *et al.,* showed that massage therapy considerably decreased diastolic and systolic BP (Olney, C.M. 2005; Yeganehkhah, M. R. *et al.,* 2008; Moeini, M. *et al.,* 2011; McNamara, M. E. *et al.,* 2003; & Çinar, Ş. *et al.,* 2009). Whereas Robert had conducted a study to Impact of classic massage on blood pressure in patient with clinically diagnosed hypertension and reported the findings that the significant drop in both systolic and diastolic blood pressure (Robert, W. 2015). In current study changes was found only is systolic blood pressure due to time period and its need further investigation by doing the study in long term or increase the frequency or duration of back massage therapy. Moreover the supportive study participants were exclusively congestive cardiac failure but the present study is the mixed group of cardiac disorder patients. WL Chen et, al**,** who investigated the effectiveness of back massage intervention on anxiety, comfort and physiological response in patient with congestive heart failure and found back massage significantly reduced anxiety, systolic blood pressure decreased to greater degree in the male participants. However present study does not examine the anxiety and comfort level of the patient (Chen, W. L. *et al.,* 2013). Nonetheless, the results of the studies by In another study done by Ramesh chandrababu et, al who demonstrated the effect of massage therapy improving the heart rate, blood pressure and post-operative outcomes of patients who underwent cardiac surgery but he suggested that an additional research is need to improving for the use of massage therapy (Ramesh, C. *et al.,* 2015). Amol sable *et al.,* and Mahadeo B Shinde *et et al.,* who observed that back massage technique is effective in improving the sleep quality (Sable, A. *et al.,* 2017; Shinde, M. B., & Anjum, S. 2014). The present study did not observe the sleep quality and recommended to conduct the similar study with large number of samples by assessing the other parameters like inflammatory markers anxiety, stress, sleep quality and quality of life.

CONCLUSION

The present study findings concluded that back massage with lavender oil is a simple, safe, non-pharmacological and cost effective method in reducing the heart rate and systolic blood pressure among patients with cardiac disease. This method is easy to practice even at home and has no side effects. Hence back massage could be suggest as a complementary and supportive measures along with pharmacological interventions to stabilize the vital signs among cardiac patients.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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