

EFFECTIVENESS OF AUTOGENIC DRAINAGE VERSUS FLUTTER DEVICE ON RESPIRATORY QUALITY OF LIFE IN SUBJECTS WITH BRONCHIECTASIS

Physiotherapy

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ABSTRACT

Bronchiectasis is the most prevalent obstructive pulmonary disease, leading cause of breathlessness, cough and excessive mucus production, which leads to functional limitation and reduce quality of life. Physiotherapy techniques like Autogenic Drainage and Flutter device Training have been proposed as an adjunct to conventional therapy in improving the Oxygen Saturation (spo2), Pulse Rate and Quality of Life in Bronchiectasis subjects. Prospective study design. 70 subjects with mean age of 41 having a clinical diagnosis of Bronchiectasis were randomly allocated into two groups. In Group -I subjects (n=35) treated with Autogenic drainage , where as in Group-II subjects (n=35) received Flutter Device Training. The participants were given intervention once daily for 4 weeks. The Outcomes of this intervention was measured in terms of Oxygen saturation (SPO2), Pulse rate, Short Form -36 (SF-36) Questionnaire. Statistical analysis of data revealed that within the group comparison, both groups showed significant improvement in all parameters, Where as in between groups comparison Flutter Device technique showed better improvement compared to Autogenic Drainage. After 4 weeks of interventions both Autogenic Drainage and Flutter Device showed significant improvement in Oxygen Saturation (spo2), Pulse rate and Quality of life. However, Flutter device training showed more improvement compared to the Autogenic drainage technique. Thus this study concludes that Flutter Device training is a useful adjunct to conventional therapy in treating Bronchiectasis subjects.

KEYWORDS

Bronchiectasis, Oxygen saturation (SPO2), Pulse Rate, Quality of life, Autogenic Drainage, Flutter device

INTRODUCTION

Bronchiectasis is a disease that results in abnormal and permanent dilation and distortion of proximal and medium sized bronchi caused by weakening or destruction of the elastic and muscular components of bronchial wall^[1].

Recent evidenced revealed that Bronchiectasis is more common in women and elderly populations causing an increased burden on health care. In the worldwide highest reported prevalence rates of Bronchiectasis is 11.47per 1000 population. In recent survey of 5.6 million patients, a prevalence of 52 per 1,00,000 adults, with a prevalence of 272 per 1, 00,000 for elderly aged >75 years^[2].

There was age related Bronchiectasis hospitalized patients annual increase of 2.4% in man and 3.0% in women. About 1000 deaths occurred a year but this rate increased 3 % and was considered due to increase age, advance spread of Bronchiectasis in elderly^[3]. In India prevalence of Bronchiectasis ranging from 1.5 to 2.5% in men and 8.5 to 35 % in women.

Bronchiectasis effects the people across the spectrum of age but highest prevalence across the women over the age of 65 years^[4]. It is also common in other parts of world reported that 1.2% of individuals over the age of 40 years have been diagnosed with the disease^[5].

Etiological factors associated with Bronchiectasis are post infective(Post pneumonia, Whooping cough, Measles, Mycobacterial Infection), Mucociliary disorder(Immotile cilia, Kartageners Syndrome, Youngs Syndrome), Obstructive Foreign body, Mycobacterial infection, Obstructing Cancer), Immune disorder (Hypogamma- globulinemia, HIV infection, cancer, allergic Bronchopulmonary Aspergillosis), Rheumatic/Inflammatory disease), Extremes of age, Malnutrition/socio economic disadvantages, COPD, aspiration, Alpha-1 Antitrypsin deficiency , Miscellaneous (Yellow syndrome)^[6].

In Bronchiectasis, irreversible dilation of bronchi occurs and is

associated with destruction of muscular and elastic components of the bronchi wall this result in permanent dilation and inflammation of bronchial wall. The distended bronchi have the tendency of retaining secretion; these secretions become infected triggering an ongoing and persistent host inflammatory response leading to loss of respiratory cilia and a progressive airway obstruction because of edema and excessive mucus^[7].

Bronchiectasis most frequently involves both the lower lobes, when the involvement is unilateral; it affects the terminal bronchi and bronchioles and is most frequently seen in the left lingual and right middle lobe^[8].

The symptoms of Bronchiectasis are cough and sputum production often muco purulent or purulent in nature. There may be associated haemoptysis and the symptoms of a more generalized bronchitis such as wheeze and dyspnea. The patient may have poor general health, finger clubbing and lethargy. Crepitations may be heard over the areas of retained secretions^[9].

Bronchiectasis can be often diagnosed from the chest radiograph if a lateral and penetrated film is taken as well as routine posterior- anterior view⁷. Diagnosis is but made on clinical history of cough, sputum production, radiographic changes on CT scan, bronchial wall thickening and luminal dilation^[10]. Though the routine chest radiograph can sometimes suggest the presence of Bronchiectasis; a High-Resolution Computerized Tomography scan (HRCT) is the gold standard for confirming the Bronchiectasis and extent of the disease^[11]. The Medical Treatment plan for the Bronchiectasis patient should include medical treatment of exacerbations, anti-inflammatory therapies, maintenance of antibiotics if required, attention to general clinical care including education on nutrition, maintaining a healthy lifestyle, receiving appropriate vaccinations (against influenza and pneumococcal infections) and airway clearance therapies^[12-18].

Effective clearance of mucus from the airways may break the vicious cycle of disease process, by decreasing the stagnation of mucous and

mucous plug formation associated with bacterial colonization, recurrent infection and inflammation.

Chest physiotherapy has been used for many years and a number of techniques are available for mobilizing secretions such as Postural Drainage, Active Cycle Breathing Technique (ACBT), Autogenic Drainage, Oscillatory Positive Expiratory Pressure devices and High frequency chest wall oscillations^[19-20].

Autogenic Drainage is system of breathing techniques in which the patient has to breathe at different lung volume to mobilize the secretions from the periphery of the lung field to central airways from where it can be coughed out or huffed out^[21-22].

The Flutter Device is a portable pipe shaped device with a hardened plastic mouth piece at one end, a plastic protective, perforated cover at the other end, and a high – density stain less steel ball resting in a plastic circular cone inside the bowl of the “pipe”. During expiration through the Flutter device, the expiratory flow moves the steel ball up and down by creating Positive Expiratory Pressure and oscillations with a back transmission of oscillations to the patient, to facilitate mucus expectoration^[23-24].

MATERIALS AND METHODS

Study Design: Prospective Study

Ethical Clearance And Informed Consent: The study protocol was approved by the Ethical Committee of GSL Medical College (Annexure-I) the Investigator explained the purpose of the study and given the subject information sheet. The participants were requested to provide their consent to participation in the study (Annexure-II). All the participants signed the informed consent and the rights of the included participants have been secured.

Study Population: Subjects clinically diagnosed as Bronchiectasis by the Pulmonologist.

Study Setting: The study was conducted at Department of Respiratory Medicine, GSL Medical College and General Hospital, Rajamahendravaram, Andhra Pradesh, India.

Study Duration: The study was conducted during the period between July 2019 to June 2020.

Sampling Method: Simple Random Sampling

Intervention Duration: 4 weeks of training programme which includes Autogenic Drainage and Flutter Device.

Sample Size: A Total number of 93 subjects with Bronchiectasis were screened of in that 70 subjects were recruited who are willing to participate in the study. Recruited participants were explained the purpose and relevance of the study. Those willing to Volunteer were included in the study after obtaining informed consent. All the eligible participants were consecutively randomised to either Autogenic drainage or Flutter device training group with 35 in each group.

Inclusion Criteria:

Patients of age between 20 and 65 years (both males and females), Clinically stable patients with no evidence of exacerbations of Bronchiectasis, Absence of acute and or Respiratory failure, Patients with Persistent cough with mucopurulent sputum production, Patients with exertional dyspnea, No contraindications for Physiotherapy techniques.

Exclusion Criteria:

A history of Pneumothorax, Presence of Cor Pulmonale or Heart Failure, Recent history of acute Myocardial Infarction, Presence of vertebral Fracture, Severe Osteoporosis, Bronchial Asthma.

OUTCOME MEASURES

1. Pulse Oximeter^[25-27] (Dr Trust USA Signature Fingertip Pulse Oximeter) is a non-invasive, simple, inexpensive, and rapid test to estimate haemoglobin oxygen saturation and pulse rate. An oxygen saturation (SpO₂) <92% indicates hypoxaemia, but values between 93% and 95% are lower than normal. In COPD patients, SpO₂ values <95% predict hypoxia.

2. Short Form – 36 (SF-36) Questionnaire^[28-29] is a generic health-

related quality-of-life instrument, which has been used to assess quality of life in a variety of chronic medical conditions including COPD and asthma. This 36-item measure is divided into the following 8 subscales providing information on 36 items: physical functioning (10 items), social functions (2 items), role limitations due to physical problems (4 items), role limitations due to emotional problems (3 items), general mental health (5 items), vitality and fatigue (4 items), pain (2 items), general health perception (5 items), and health transition (1 item). Items within subscales are summed up to provide a total score ranging from zero (negative health) to 100 (positive health).

INTERVENTION

The Study consists of 4 weeks of intervention, which includes Autogenic Drainage technique in Group I and Flutter Device in Group II. The Outcome Measurements are measured by using Pulse Oximeter for SPO₂ & Pulse Rate and SF-36 Questionnaire for Quality of Life at base line and at the end of interventions. All the eligible Participants were consequently randomized into either Group I or Group II. During training Programme all the subjects were allowed to continue their medical treatment.

GROUP I: AUTOGENIC DRAINAGE³²

The subject is allowed to be seated upright in a chair with back support. The upper airways are cleared of secretions by huffing or blowing the nose. The therapist is to sit to the side and slightly behind the subject closes enough to hear the subject's breathing. Subjects' hands are placed on the abdomen to feel the work of abdominal muscles and the therapist hand should be placed on the upper chest to feel the secretions. The technique includes unstitching, collecting and evacuating phases. A series of 10 -20 breaths at low lung volume of inhalation was done slowly through the nose using diaphragm and 2-3 seconds of breath hold allowing collateral ventilation to get air behind the secretions. Cough and huff are not encouraged at this phase. Exhalation is done through the mouth. The vibration of mucus is felt by therapist's hand placed on upper chest then the patient was asked to breath at normal tidal volume followed by for 10 -12 breaths followed by breathing near the vital capacity. The frequency of the vibrations revealed their locations. High frequency reveals secretions located in small airways. Low frequencies mean that secretions were moved to larger airways. At the end of session, the mucus is evacuated by a stronger expiration or a high volume huff or cough.

GROUP B: FLUTTER DEVICE³³

The patients placed in erect positions, in a well-supported chair with a neutral lumbar spine to enhance the function of diaphragm and the pelvic floor minimizes musculoskeletal stress and to ensure the best transmission of vibration to chest wall.

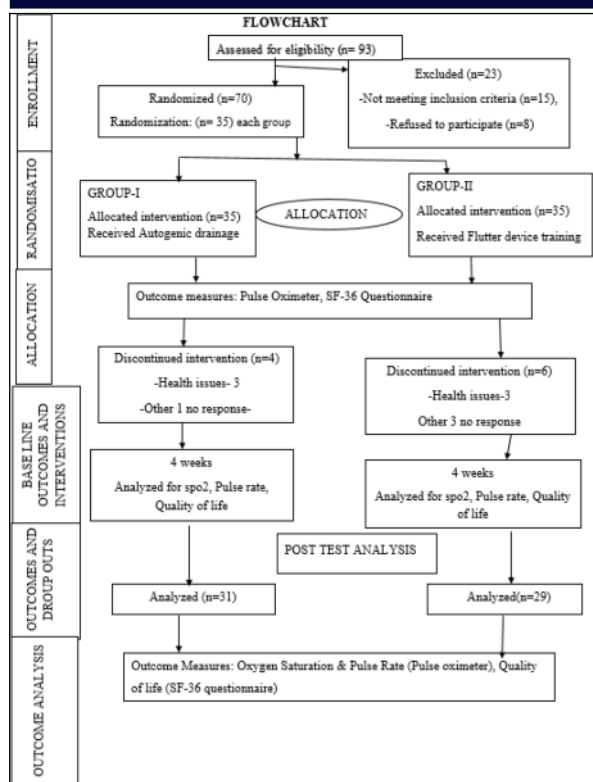
They are instructed to inhale deeply and hold his/ her breathe for 2-3 secs, and then expire slowly through the flutter valve, which causes oscillations of the steel ball inside the cone of the flutter. Routinely three sets of 15 exhalations are performed over 12 to 20 min.

After each series of exhalations, patients are instructed to “huff” and cough, thereby aiding expectoration³⁴. As the generation of the oscillation and pressure are dependent on the expiratory flow and gravity forces. The frequency of the oscillations is modulated by changing the inclination of flutter device slightly up or down from its horizontal position. The neutral position (0 degrees) is considered as one in which the device has an angle of 90 degrees with the head position i.e., Parallel to the ground. In general, the device turned upwards (positive degree) the pressure and oscillations are increased, while the device turned downwards (negative degrees), the pressure and oscillations are decreased.

Statistical Analysis

All statistical analysis was done by using SPSS software version 21.0 and Microsoft excel-2007. Descriptive data was presented in the form of mean ± standard deviation and mean difference percentages were calculated and presented.

Independent student “t” test was performed to assess the statistically significant difference in mean value between the groups for Oxygen Saturation (SPO₂), Pulse Rate and SF-36 Quality of Life questionnaire components. Paired Student “t” test was performed to assess the statistical difference within the groups for oxygen saturation (SPO₂), Pulse Rate and SF-36 Quality of life questionnaire components from pre-test and post-test values. For all statistical analysis, P < 0.05 was considered as statistically significant.



RESULTS

The aim of the study was to find the Effectiveness of Autogenic drainage versus Flutter Device on Respiratory Quality of life in patients with Bronchiectasis. The consort flow chart of the study showed the study organization in terms of Subjects Screening, Random allocation and analysis following the Intervention. A total 93 subjects were screened for eligibility, amongst 70 subjects were included in the study trail. All the 70 subjects who met inclusion criteria have undergone baseline assessment and included subjects were randomized into two equal groups consisting 35 subjects. In this study, 31 participants completed training in Group-I and 29 participants completed training in Group-II with dropouts of 4 and 6 in respective groups.

DISCUSSION

Aim of the study was to investigate “The Effectiveness of Autogenic Drainage versus Flutter Device on Respiratory Quality of Life in subjects with Bronchiectasis”. In this study the subjects were assessed for Oxygen Saturation (SPO2), Pulse Rate and Respiratory Quality of Life by using Pulse oximeter and Short Form – 36 (SF-36) Questionnaire respectively.

In this study, the subjects were assessed for Bronchiectasis underwent either Autogenic Drainage or Flutter Device training which are performed for 4 weeks the parameters usually assessed before and after treatment training.

In this study (Group – I) Autogenic Drainage technique have showed statistically significant difference within the groups from Pre- test to Post –test values in improving the Oxygen Saturation, Pulse rate and respiratory Quality of life in Subjects with Bronchiectasis.

In this study (Group – II) Flutter Device technique have showed statistically significant difference within the groups from Pre- test to Post-test values in improving the Oxygen Saturation, Pulse rate and respiratory Quality of life in Subjects with Bronchiectasis.

In the present study Pulse Oximeter is used to assess Oxygen Saturation (SPO2) and Pulse Rate. The results showed that the Autogenic drainage technique P value (<0.0002) of Oxygen saturation (SPO2) from Pre-test to Post-test are highly significant within the groups. The slow inspiration and breath hold provides the Optimal filling of obliterated airways of lung segments while avoiding excessive intra pleural pressure which could compress the unstable airways. This technique shows an improvement of Oxygen Saturation due to the

increased alveolar ventilation and CO2 washout resulting out of hyperventilation, which could have been an effect of diaphragmatic breathing at different lung volumes. This present study supported by maiz.et.al reported that autogenic Drainage shows significant improvement in Oxygen Saturation in comparison to ACBT in subjects with Bronchitis^[35].

There were highly significant p value (< 0.0002) of pulse Rate of Autogenic Drainage technique from pre- test to Post – test within the groups. A study done by Richa.et.al^[36] stated that there was significant improvement of Pulse rate is Exclusively via Vagal With drawl with little evidence for systemic sympathetic nerve activity until the exercise intensity is at above the maximal steady state. Our study was supported by Richa.et.al. Reported that Autogenic Drainage shows improvement in Pulse Rate in Comparison to the flutter Device in COPD Patients.

Simbi Skaria.et.al^[37] also compared the effect of expiratory pressure technique over Autogenic Drainage in Chronic Bronchitis and the study reported that there is significant improvement in the oxygen saturation and Pulse rate which is compatible with our study. The reason may be due to reduction of Dynamic lung volumes and static lung volumes which means the Hyperinflation of Lungs. This mechanism explains improvement in Alveolar ventilation increase of SPO2 and Pulse Rate^[38,39].

The results shown that the flutter Device P Value (<0.0002) of oxygen saturation (SPO2) from pre-test to Post test are highly significant within Group. The flutter valve causes the steel ball bearing to sway at a high recurrence, bringing about the vibration of airways and discontinues positive expiratory pressure to encourage the mucus production. This technique shows an improvement of Oxygen saturation due to improved cough clearance by keeping airways open during lightly forced expiration through the added positive airway pressure produced during expiration. The shear rates during a manoeuvre of cough after Flutter device training with consequent flow and pressure changes have high enough to move the Bronchial secretions, but not so high that airway collapses occurs^[40].

Our study was supported by Konstan.et.al^[40] reported that the significant improvement of mucus clearance and voluntary coughing with improvement of SPO2 in patients with Cystic Fibrosis.

The results shown that the Flutter Device P value (<0.0001) of pulse rate from pre- test to post – test are highly significant within Groups. The Flutter valve showed that such oscillations could breakdown the bonds of Mucus macromolecules, making the mucus less thick and consequently more easily transported through airways improves the pulse rate through the Vagal With drawl with little evidence for systemic sympathetic nerve activity until the exercise intensity is at above the maximal steady state^[37]. Our study was supported by Richa.et.al. Reported that Autogenic Drainage shows improvement in Pulse Rate in Comparison to the flutter Device in COPD Patients^[37].

The results shown that there is significant improvement in SF-36 Questionnaire Components in Both the groups. In Autogenic Drainage results shown that P value (<0.0001) of physical functioning, Role Limitations due to physical problems, role Limitations due to Emotional Problems, P value (<0.0002) of Energy / Fatigue , Emotional well-being , social functioning, P value (<0.0005) of pain , P value (<0.0004) of General health from pre-test to Post-test are highly Significant within the groups.

The results shown that there is significant improvement in SF-36 Questionnaire Components in Both the groups. In Flutter Device results shown that P value (<0.0001) of Physical functioning, Social Functioning, pain , P value (<0.0003) of role limitation due to physical problems , P value (< 0.0002) of role limitation due to Emotional problems , P value (<0.0007) of Energy/ Fatigue, P value (<0.0008) of general Health , Emotional Well Being respectively. This study shown the statistically significant improvement in both mental components score and physical components Scores of SF-36 Questionnaire.

Both groups showed improvement in SPO2, Pulse Rate and Respiratory Quality of Life at post test. But Flutter device group showed more percentage of improvement when compared to Autogenic Drainage group.

This may be due to improving Mucus clearance and SPO2, Pulse rate

and Respiratory Quality of Life when the vibration occurred in the Flutter cone elaborates the airways resulting loosening the secretions, raises the end bronchial pressure intermittently during expiration, maintains the airway patency and reduces their collapsibility of Airways. This technique is effective in improving SPO₂, Pulse rate and respiratory Quality of Life. Hence, we conclude that the patients with Bronchiectasis can achieve significant benefit using Flutter Device technique.

ACKNOWLEDGEMENTS

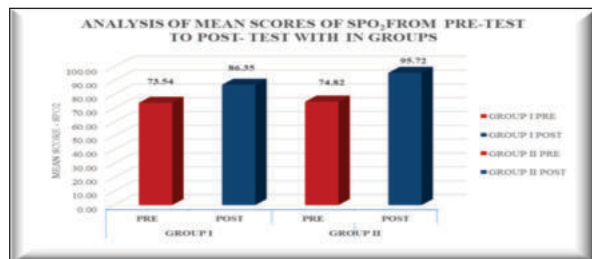
I am grateful to Dr.Ganni BhaskarRao, Chief Patron, G.S.L Educational Institutions, Rajamahendravaram, for his valuable support and help in permitting me to take the subjects from G.S.L Medical College & General Hospital. I take this pleasant and unique opportunity to express my deep sense of gratitude and offer my most sincere and humble thanks to My Guide T.Sunil Kumar, MPT(Cardiovascular and pulmonary). I also sincerely thank to my co-guides for their valuable suggestions and constant look to bring out this work Dr.Patchava Appa Rao MPT (Orthopaedics) Ph.D., MBA, Dr.S.Jyothi MPT (caerdiovascular and pulmonary), Assistant professor and Statistician Mr.Ch.Ganapathi swamy for their valuable guidance & information .I thank almighty my parents and friends for their encouraging me and leading me through this gratifying task.

CONCLUSION

The present study concluded that Four weeks of Interventions of Autogenic drainage and Flutter Device training were shown statistically significant improvement on Oxygen saturation, Pulse rate and Quality of life. However, more Percentage of improvement was found in subjects received Flutter Device training when compared to the Autogenic Drainage Technique. Thus this study concludes that Flutter Device is a suitable adjunct to Conventional Physiotherapy Treatment Techniques in subjects with Bronchiectasis.

Table 1 Analysis Of Mean Scores Of Spo₂ From Pre-test To Post-test Within Groups

GROUPS	SPO ₂	MEAN	SD	P value	Inference
GROUP -I	PRE	73.54	2.947	0.0002*	significant
	POST	86.35	3.920		
GROUP-II	PRE	74.82	4.166	0.0002*	Highly significant
	POST	95.72	4.550		

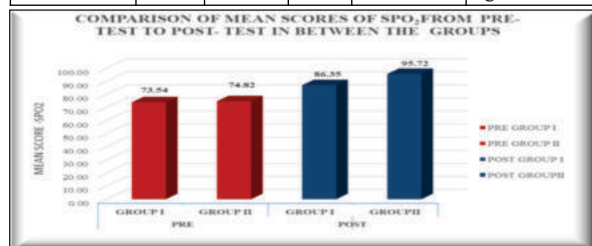


Graph 1

Results: The above Table and Graph shows that the mean score of SPO₂ changes within the group from pre-test to post-test in both the groups are found to be statistically significant ($p < 0.05$)

Table 2 Comparison Of Mean Scores Of Spo₂ From Pre- Test To Post- Test In Between The Groups

GROUPS	SPO ₂	MEAN	SD	P Value	Inference
GROUP-I	PRE	73.54	2.947	0.369	Insignificant
GROUP-II		74.82	4.166		
GROUP- I	POST	86.35	3.920	0.0001*	Highly significant
GROUP-II		95.72	4.550		



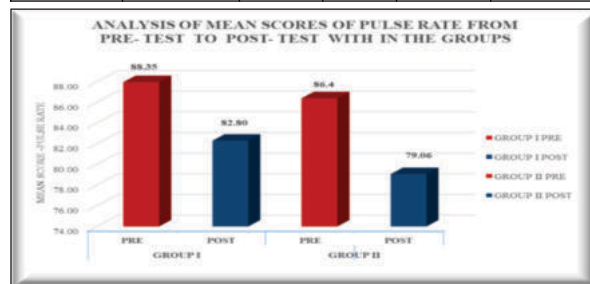
GRAPH 2

Results: The above Table and Graph shows that at base line there is no

statistically significant difference of mean score for SPO₂ ($P > 0.05$) in the pre-test values and there is a statistically significant difference of mean score for SPO₂ ($P < 0.05$) in the post test values.

Table 3 Analysis Of Mean Scores Of PULSE Rate From Pre- Test To Post- Test With In Groups

GROUPS	PULSE RATE	MEAN	SD	P Value	Inference
GROUP-I	PRE	88.35	8.938	0.0002*	Significant
	POST	82.80	6.523		
GROUP-II	PRE	86.40	7.853	0.0001*	Highly significant
	POST	79.06	5.331		

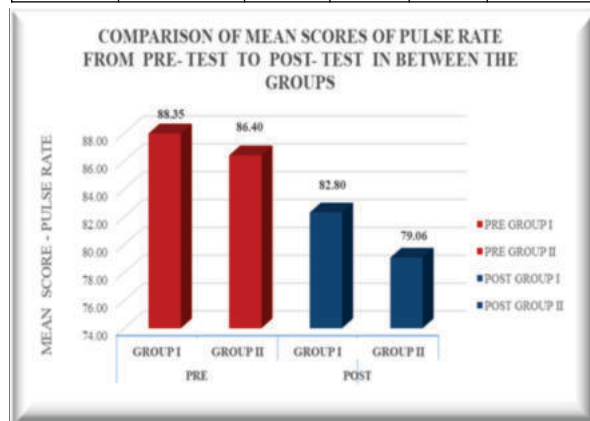


GRAPH 3

Results: The above Table and Graph shows that the mean score of Pulse rate changes within the group from pre-test to post-test in both the groups are found to be statistically significant ($p < 0.05$)

Table 4 Comparison Of Mean Scores Of Pulse Rate from Pre-test To Post-test In Between The Groups

GROUPS	PULSE RATE	MEAN	SD	P Value	Inference
GROUP-I	PRE	88.35	8.938	0.47	Insignificant
GROUP-II		86.40	7.853		
GROUP-I	POST	82.80	6.523	0.03*	Significant
GROUP-II		79.06	5.331		



Graph 4

Results: : The above Table and Graph shows that at base line there is no statistically significant difference of mean score for Pulse rate ($P > 0.05$) with in the groups and there is a statistically significant difference of mean score for Pulse rate ($P < 0.05$) between the groups.

Table 5 Analysis Of Mean Scores Of Physical Functioning (SF-36) From Pre-Test To Post- Test Within Groups

GROUPS	PHYSICAL FUNCTIONING	MEAN	SD	P Value	Inference
GROUP-I	PRE	52.70	8.619	0.0001*	Highly significant
	POST	72.38	10.121		
GROUP-II	PRE	52.79	15.095	0.0001*	Highly Significant
	POST	88.17	12.470		

Table 6 Comparison Of Mean Scores Of Physical Functioning (SF-36) From Pre-test To Post- Test In Between The Groups

GROUPS	PHYSICAL FUNCTIONING	MEAN	SD	P Value	Inference
GROUP-I	PRE	52.70	8.619	0.97	Insignificant
GROUP-II		52.79	15.095		

GROUP-I	POST	72.38	10.121	0.0002*	Highly Significant
GROUP-II		88.17	12.470		

Table-7 Analysis Of Mean Scores Of Role Limitation Due To Physical Problems (SF-36) Pre-test To Post-Test Within Groups

GROUPS	ROLE LIMITATION DUE TO PHYSICAL PROBLEMS	MEAN	SD	P Value	Inference
GROUP-I	PRE	27.48	11.206	0.0001*	Highly Significant
	POST	64.61	14.414		
GROUP-II	PRE	26.68	10.354	0.0003*	Highly significant
	POST	81.44	14.537		

Table-8 Comparison Of Mean Scores Of Role Limitation Due To Physical Problems (SF-36) From Pre- Test To Post- Test In Between The Groups

GROUPS	ROLE LIMITATION DUE TO PHYSICAL PROBLEMS	MEAN	SD	P Value	Inference
GROUP-I	PRE	27.48	11.206	0.84	Insignificant
GROUP-II		26.68	10.354		
GROUP-I	POST	64.61	14.414	0.0003*	Highly Significant
GROUP-II		81.44	14.537		

Table 9 Analysis Of Mean Scores Of Role Limitation Due To Emotional Problems (SF-36) From Pre-test To Post-test Within Groups

GROUPS	ROLE LIMITATION DUE TO EMOTIONAL PROBLEMS	MEAN	SD	P Value	Inference
GROUP-I	PRE	37.52	12.892	0.0001*	Highly significant
	POST	62.10	13.097		
GROUP-II	PRE	40.34	11.671	0.0001*	Highly significant
	POST	80.43	15.030		

Table-10 Comparison Of Mean Scores Of Role Limitations Due To Emotional Problems (SF-36) Pre-test To Post-test In Between The Groups

GROUPS	ROLE LIMITATION DUE TO EMOTIONAL PROBLEMS	MEAN	SD	P Value	Inference
GROUP-I	PRE	37.52	12.92	0.3616	Insignificant
GROUP-II		40.34	11.671		
GROUP-I	POST	62.10	13.097	0.0002*	Highly significant
GROUP-II		80.43	15.030		

Table 11 Analysis Of Mean Scores Of Energy / Fatigue (SF-36) From Pre-test To Post-test Within Groups

GROUPS	ENERGY/ FATIGUE	MEAN	SD	P Value	Inference
GROUP-I	PRE	56.61	11.997	0.0002*	Highly significant
	POST	68.87	12.038		
GROUP-II	PRE	61.06	12.032	0.0007*	Highly significant
	POST	79.31	13.680		

Table 12 Comparison Of Mean Scores Of Energy/ Fatigue (SF-36) From Pre-test And Post-test In Between The Groups

GROUPS	ENERGY/ FATIGUE	MEAN	SD	P Value	Inference
GROUP-I	PRE	56.61	1.997	0.12657	Insignificant
GROUP-II		61.06	12.032		
GROUP-I	POST	68.87	12.038	0.00203*	Highly significant
GROUP-II		79.31	13.680		

Table 13 Analysis Of Mean Scores Of Emotional Well Being (SF-36) From Pre- Test To Post-test Within Groups

GROUPS	EMOTIONAL WELL BEING	MEAN	SD	P Value	Inference
GROUP-I	PRE	55.16	8.746	0.0001*	Highly significant
	POST	70.90	11.177		

GROUP-II	PRE	55.13	12.252	0.0008*	Highly significant
	POST	81.10	13.363		

Table 14 Comparison Of Mean Scores Of Emotional Well Being (SF-36) From Pre-test To Post-test In Between The Groups

GROUPS	EMOTIONAL WELL BEING	MEAN	SD	P Value	Inference
GROUP-I	PRE	55.16	8.746	0.766	Insignificant
GROUP-II		55.13	11.825		
GROUP-I	POST	70.90	11.177	0.00137	significant
GROUP-II		81.10	13.272		

Table 15 Analysis Of Mean Scores Of Social Functioning (SF-36) From Pre-test To Post-test With In Groups

GROUPS	SOCIAL FUNCTIONING	MEAN	SD	P Value	Inference
GROUP-I	PRE	58.10	9.610	0.0001	Highly significant
	POST	72.03	11.824		
GROUP-II	PRE	61.24	12.322	0.0001	Highly significant
	POST	84.79	16.540		

Table 16 Comparison Of Mean Score Of Social Functioning (SF-36) Frompre-test To Post-test In Between The Groups

GROUPS	SOCIAL FUNCTIONING	MEAN	SD	P Value	Inference
GROUP-I	PRE	58.10	9.610	0.2781	Insignificant
GROUP-II		61.24	12.322		
GROUP-I	POST	72.03	11.824	0.0012	Significant
GROUP-II		84.79	16.540		

Table 17 Analysis Of Mean Scores Of Pain From Pre-test To Post-test Pain (SF-36) With In Groups

GROUPS	PAIN	MEAN	SD	P Value	Inference
GROUP-I	PRE	66.91	11.238	0.0005*	Highly significant
	POST	46.98	8.576		
GROUP-II	PRE	66.67	10.028	0.0001*	Highly significant
	POST	41.00	8.245		

Table 18 Comparison Of Mean Scores Of Pain (SF-36) From Pre-test To Post-test In Between The Groups

GROUPS	PAIN	MEAN	SD	P Value	Inference
GROUP-I	PRE	66.91	11.238	0.8599	Insignificant
GROUP-II		66.67	10.023		
GROUP-I	POST	46.98	8.576	0.00295*	Significant
GROUP-II		41.00	8.245		

Table 19 Analysis Of Mean Scores Of General Health (SF-36) From Pre-test To Post-test With In Groups

GROUPS	GENERAL HEALTH	MEAN	SD	P Value	Inference
GROUP-I	PRE	42.96	10.131	0.0004*	Highly Significant
	POST	59.67	11.603		
GROUP-II	PRE	47.13	13.354	0.0008*	Highly Significant
	POST	70.13	15.212		

Table 20 Comparison Of Mean Scores Of General Health (SF-36) From Pre-test To Post-test In Between The Groups

GROUPS	GENERAL HEALTH	MEAN	SD	P Value	Inference
GROUP-I	PRE	42.96	10.131	0.1728	Insignificant
GROUP-II		47.13	13.354		
GROUP-I	POST	59.67	11.603	0.0041	Highly significant
GROUP-II		70.13	15.212		

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