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"A COMPARATIVE STUDY BETWEEN ERGONOMIC ADVISES VERSUS ERGONOMICS PLUS PHYSIOTHERAPY INTERVENTION IN CHRONIC LOW BACK PAIN AMONG SOFTWARE PROFESSIONALS"

Physiotherapy

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KEYWORDS

Chronic low back pain, Oswestry low back pain Disability questionnaire, Visual Analogue scale, Ergonomics

Software profession involves majority of the work being spent in front of with computers performing repetitive monotonous tasks in the sedentary sitting position that may end up making them prone to work related musculoskeletal disorders.These disorders comprises inflammatory and degenerative disease conditions that result in pain and functional impairment affecting the neck, shoulders, lower back, elbows, wrists, and hands [1]. Likewise, Postural back pain is a major health problem highly prevalent among software professionals and BPO sectors [2]. Several risk factors are contributing to the occurrence of this occupational health problem and are categorized as individual, work-related physical risk factors work related psycho-social and occupational risk factors [3].

The work related physical risk contributing to the occurrence of Low Back Pain among software workers include faulty posture, repetitive tasks, lack of ergonomic knowledge and poor workstation arrangements. A previous study indicated that poor workstation ergonomics has been shown to significantly contribute to the development of low back pain [4]. Specifically, the chair design and the utility of backrest and arm support which varies according to the workplace and individual preferences influence the level of back strain [5].

The presence of computer in the workplace leads to a set of peculiar characteristics of the workstation which require the workers to stay in a static posture for long periods [6] and it is most frequently cited risk factors leading to musculoskeletal disorders [7]. This deviation from normal alignment may suggest the presence of imbalance and abnormal strain on the musculoskeletal structure [8]. Further, an accumulated computer usage has been linked to increased risk of low back pain [9]. Specifically, sitting for more than half a day at work in combination with awkward postures or frequently working in a forward bent position has been found to increase the likelihood of having low back pain [4,10]. Studies also indicated that specific tasks performed while sitting in an ergonomically unfit chair for longer periods was also associated with low back pain [11]. A slouched posture is a kind of abnormal sitting posture with flexed lumbar spine occurs during day-to-day sitting activities [12,13]. As a result of this prolonged flexed posture, if extends for a long time, the neutral position is lost and the spine is potentially exposed to injury [14,15] . Although the etiology of low back pain is complex and multi-factorial, an incorrect sitting posture could play a relevant role in determining both an increase of stress within the disc [16,17] and a sustained stretch of passive lumbar structures in combination with poor back muscle activity [18].

Ergonomics is the science of designing the job, equipment, and workplace to fit the worker, while maintaining the efficiency of people in the workplace. The use of ergonomics keeps workers safe, comfortable, and productive. Improving work posture, reduced force, and less repetition prevents injuries. Following a few simple ergonomic guidelines, can prevent injuries that develop because of continuous physical activity over a long period of time [19].

Ergonomics, often referred to as "Human Factors" ergonomics, is the science of applying physical and psychological principles within an environment to increase both productivity and well-being. Ergonomics is simply classified as

1. Physical Ergonomics 2. Cognitive Ergonomics 3. Organizational Ergonomics [20].

Physical Ergonomics places a greater emphasis on the human anatomy, physiology, and biomechanical factors influencing movement patterns and posture. This area of ergonomics is therefore of significant interest to physiotherapists[21].

Low Back Pain can be defined as pain originating in the low back region that may or may not radiate down into the legs. This pain can further be categorized by sensation such as dull or sharp pain as well as duration:
 Acute (<6 weeks), Sub-acute (6-12 weeks), Chronic (>12 weeks) [22].

Chronic low back pain has been associated with neurochemical, structural, and functional cortical changes [23] of several brain regions including the somatosensory cortex [24].Complex processes of peripheral and central sensitization may influence the evolution of acute to chronic pain [25].

AIMS AND OBJECTIVES:

The main aim of this study is to determine the effect of such an Ergonomic advises and Ergonomic plus Physiotherapy interventions on functional and symptomatic parameters of moderately disable software professionals with chronic low back pain.

This study main objective is to find out the physio therapeutic interventions and Ergonomic advises combination to manage postural chronic low back pain among software professionals.

HYPOTHESIS:

Null Hypothesis:-

There is no effect between Ergonomic advises versus Ergonomics plus Physiotherapy intervention in chronic low back pain in among software professionals.

Alternative Hypothesis:-

There is an effect between Ergonomic advises versus Ergonomics plus Physiotherapy intervention in chronic low back pain in among software professionals.

METHODS AND MATERIALS:

1. Study Setup: Miracle Software Solutions. IT solutions, Data operating centres, Satyam Hospitals, Sails soft solutions - located in Visakhapatnam

2. Methods Of Data Collection :

Study Design- Experimental design (Comparative)

Sample Size - 30 Participants (15 Subjects in each group)

Sample Design- Convenient Sampling Technique.

Materials Used:

Informed Consent Form, Assessment Form, Visual Analogue Scale Form, Oswestry Low Back Pain Disability Questionnaire, Hand Wash, Sanitizer, Mask, Pen, Paper, Pencil, Treatment Table and Pillows, Sitting Chairs and Pillows,Cushions for Support, Mckenzie Exercises Chart.

Inclusion Criteria:

- Age and Sex – 25 to 50 Years (Both Male and Female).
- History of Low Back Pain greater than 2 months.

- Working hours minimum 30 hours per week.

Exclusion Criteria:
- History of Hospitalization in last one year.
- Acute Low Back Pain.
- Any Abdominal Surgery.
- Worsening Neural signs
- Congenital condition.

MEASURING TOOLS:
Visual Analogue Scale (26)
Oswestry Low Back pain Disability Questionnaire(27)

METHODOLOGY:
After Inclusion and Exclusion Criteria were verified, the patients who were qualified for the study were explained about the pros and cons of the study. Their written informed consent was taken. Sampling was done following convenient sampling technique. Baseline measurement of pain intensity of all patients was measured using visual analogue scale. Oswestry low back pain disability questionnaire was taken to find the level of disability due to low back pain.These must be checked before the start of treatment. This helps to know the patient pain level, disability level for suffering from chronic low back pain and thus in providing proper Ergonomics Advises and Physiotherapy Interventions. 30 Patients were divided into two equal groups. Both Group A and B. Here, Group A were given Ergonomic Advises for 6 weeks and Group B were given Physiotherapy Interventions with Ergonomic Advises for 3 Session/week, up to 6 weeks.

GROUP-A: In this group, firstly the patient must be assessed and VAS scale scoring must be taken and Oswestry Low Back Pain Disability Questionnaire must be taken .After taking the Analysis the patients must be advised with the ERGONOMICS. The main aim of this group patients is to correct the postures of their daily living activities, at working activities etc., by advising them the Ergonomics. The duration taken is 6 weeks.

GROUP- B: Another 15 patients in GROUP- B were assessed and VAS scale recording was taken and Oswestry Low Back Pain Disability Questionnaire was also taken. Here, both Ergonomic Advises and Physiotherapy Interventions must be done to the patients.

Physiotherapy Interventions are McKenzie BACK STRENGTHING EXERCISES. These exercises are prescribed to these group patients along with advising Ergonomics (postural corrections) in daily activities as well as in working activities mainly regarding Software Professionals. The duration taken is 3 session/ week up to 6 weeks. The patients must be under guidance till the treatment period ends. The therapist must be available to the grouped patients in any time regarding the treatment protocols. DO"S and DONT"S must be explained to the patients carefully. Home Advises must be explained.

Statistical Analysis:

Table -1 Analysis Of Mean Scores Of VAS Within Group A

		Mean	SD	t- Value	df	P- Value	Inference
Group A	Pre	**5.06**	**0.67**	**15.33**	**14**	**0.001**	**Significant**
	Post	**2.53**	**0.618**				

Results: Table 1 shows changes in Pre-test and Post-test values of VAS within the Group A which were found to be statistically much significant.(P- value<0.05).

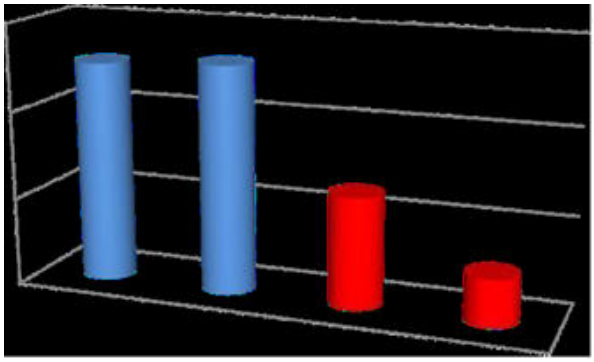
Table-2 Analysis Of Mean Scores Of VAS Within Group B

		Mean	SD	t- Value	df	P- Value	Inference
Group B	Pre	**5.20**	**0.83**	**19.19**	**14**	**0.001***	**More Significant**
	Post	**1.06**	**0.57**				

Results: Table 2 shows changes in Pre-test and Post-test values of VAS within the Group B which were found to be statistically significant.(P- value<0.05).

Table -3 Comparison Of Mean Scores Of VAS Between The Groups A & B

		Mean	SD	t-Value	df	P-Value	Inference
PRE	Group A	5.06	0.67	-0.46	27	0.64	Not Significant
	Group B	5.20	0.83				
POST	Group A	2.53	0.618	6.50	28	0.001	Significant
	Group B	1.06	0.57				



Graph -1

Results: The above Table 3 and Graph 1 shows changes in Pre-test values and Post test values of VAS between the groups which were found to be statistically significant(P-Value<0.05).

Table - 4 Analysis Of Mean Scores Of ODI Within Group A

		Mean	SD	t-Value	df	P-Value	Inference
Group A	Pre	32.00	4.71	11.93	14	0.001	More Significant
	Post	16.80	2.8				

Results: Table 4 shows changes in Pre-test and Post-test values of ODI within the Group A which were found to be statistically significant.(P-value<0.05).

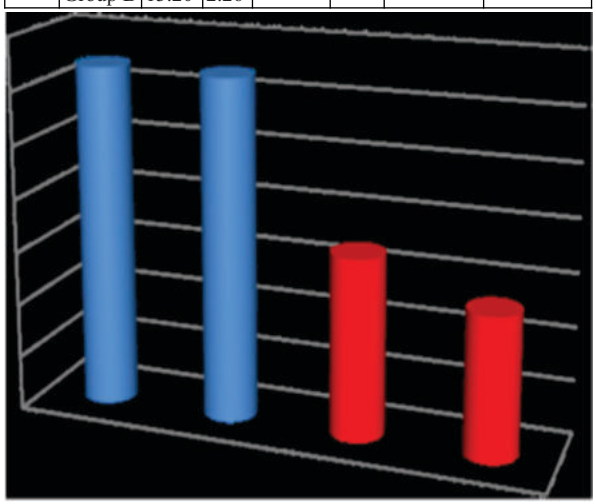
Table -5 Analysis Of Mean Scores Of ODI Within Group B

		Mean	SD	t- Value	df	P- Value	Inference
Group B	Pre	31.90	4.13	14.64	14	0.001*	More significant
	Post	13.20	2.26				

Results: The above Table 5 shows changes in Pre-test and Post-test values of ODI within the Group B which were found to be statistically significant.(P- value<0.05).

Table -6: Comparison Of Mean Scores Of ODI Between The Groups A & B

		Mean	SD	t- Value	df	P- Value	Inference
PRE	Group A	32.00	4.71	0.03	28	0.96	Not
	Group B	31.90	4.13				
POS	Group A	16.80	2.8	3.73	27	0.001	Significant
	Group B	13.20	2.26				
		Mean	**SD**	**t- Value**	**df**	**P- Value**	**Inference**
PRE	Group A	32.00	4.71	0.03	28	0.96	Not
	Group B	31.90	4.13				
POS	Group A	16.80	2.8	3.73	27	0.001	Significant
	Group B	13.20	2.26				



Graph - 2:

Results:
The above Table 6 and Graph 2 shows changes in Pre-test values and Post test values of ODI between the groups which were found to be

statistically significant(P-Value<0.05).

DISCUSSION:

These findings show that a combined physiotherapy treatment consisting of manual therapy, specific exercise training, and neurophysiology education is effective in producing functional and symptomatic improvement in chronic low back pain in software professionals. The results of the study are in favor of Ergonomics plus Physiotherapy intervention. In this study, low back pain has been relieved after Ergonomics plus Physiotherapy intervention. The current results suggest that the combined physiotherapy treatment is probably more effective than the ergonomic. This is primarily evidenced by the fact that most of the effects of sole treatments reported in the literature are small, particularly in those studies that involved subjects with high initial disability levels. Chronic low back pain is heterogeneous and subjects vary across studies in their chronicity, pain intensity, functional level and pain impact. This means that the validity of a comparison between the current work and other studies is limited. This result of study coincide with the study of Moseley L (2002): Combined physiotherapy and education is efficacious for chronic low back pain(29). Group A which had undergone only ergonomic intervention also showed significant effectiveness in pain relief coinciding to various research works showing similar results(29,30) . Nevertheless even when both groups (A & B) were effective in chronic low back pain, group B had greater effectiveness in pain relief and improved functional performance in Farmers(31). Researches proved that Ergonomics plus Physiotherapy intervention more effective.(32,33,34).

CONCLUSION

In this study, we conclude that Ergonomics plus Physiotherapy intervention to give greater improvement in pain, and functional performance in chronic low back pain among Software Professionals.

LIMITATIONS AND SUGGESTIONS OF THE STUDY:

The study was not conducted on a large scale and study sample was considerably less. No electrotherapy modality is included in the intervention program. Psychological and environmental factors were not taken into consideration.

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