



**A COMPARATIVE STUDY TO FIND THE EFFECTIVENESS OF
ACTIVE IMPLEMENTATION VERSUS PASSIVE IMPLEMENTATION
STRATEGY ABOUT BACK CARE ADVICE IN NONSPECIFIC LOW
BACK PAIN AMONG PARAMEDICAL STUDENTS.**

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INTRODUCTION

Lower back pain is ranked first as a cause of disability and inability to work, and expected to affect up to 90% of the world's population at some point in their live.1It is the most common and costly musculoskeletal problem affecting the working population. The consequences to injured workers range from temporary discomfort to permanent disability. It is also leading cause of disability in people under 45 years of age and accounts for roughly 40% of all disability claims in the West. In India, approximately 35% people suffer from chronic back pain, which significantly hampers their day-to-day

routine.^[2]

The term mechanical back pain is often used loosely to imply back pain where no specific pathology has been identified. A better term for this is "simple backache." Mechanical pain is simply back ache which alters in relation to the patients posture or activity.^[1]

The most common type accountsfor approximately 90% of cases in primary care settings. ^[1-6]
Less than 2% of people withlow back pain. These patients use more than 80% of health care

resources for back problem.¹ Causative factor for persistent nonspecific low back pain is disability of spine, studies of individuals with low back pain have identified impairment in the control of the deep trunk muscles responsible for the stability of spine.

Non-specific low back pain is tension, soreness and/or stiffness in the lower back region for which it is not possible to identify a specific cause of the pain. Several structures in the back, including the joints, discs and connective tissues, may contribute to symptoms due to Mechanical factors, such as lifting and carrying.

There is strong evidence of an association between low back pain and workplace physical factors, and non-related characteristics. Non-work related characteristics include physical fitness, anthropometrics measures, lumbar mobility, physical, strength, medical history and structural abnormalities of the individuals. Work place physical factors include heavy physical work, lifting and forceful movement, awkward postures, and static work postures of prolonged standing, sitting and sedentary work or isometric positions where very little movement take place. These postures are typically cramped or inactive and cause static loading on the muscles^[3].

The lower back furnishes support for the upper body and transmits the weight of the upper body to the pelvis and lower limbs. It carries most of the individual's weight and is the site of most back pain.

Causes of pain

Pain results from mechanical or chemical irritation of nociceptive nerve fibers. In the lower back, these pain receptors are located in the outer one third of the intervertebral disk, the facet joint capsule, the anterior and posterior longitudinal ligaments, and the musculoligamentous supporting structures of the lumbar spine. Back pain, however, cannot be thought of as purely an anatomic or biomedical problem. Psychological.

factors also play a significant role in the onset of back pain and in the transition from acute to chronic pain and disability. Depression, anxiety, distress, and cognitive factors, such as passive coping and catastrophizing (blowing minor events to major proportions), have been closely linked to pain and disability.^[2, 3]

Basic Biomechanics of the Lumbar Spine: The lumbar spine, although often described as a single functional unit, is composed of five vertebrae forming what are called "motion

segments" connected in series. Each motion segment consists of two adjacent vertebral bodies and the connecting ligaments. Spinal motion segments represent the smallest segments of the spine exhibiting biomechanical characteristics similar to those of the entire spine.

Translation and rotation can occur at each spinal motion segment. Translation occurs when a shear force causes one vertebra to move parallel to the adjacent vertebra. Rotation is the spinning of one vertebra about a stationary axis relative to the adjacent vertebra caused by a torque. Translation and rotation occur at each motion segment during lumbar spine movements in any of the cardinal body planes. For example, lumbar flexion involves anterior translation and rotation, and lumbar extension involves posterior translation and rotation of each lumbar motion segment in the sagittal plane.

ACTIVE STRATEGY AND PASSIVE STRATEGY(Self management): Evidences support the use of advice to remain active in addition to specific advice relating to the most appropriate exercise, and or functional activities to promote active self management^[9]. NS-LBP- Guidelines suggest that the intervention should consist of an *active approach* in which the patient learns to take control over his or her back pain. Patients' coping strategy and beliefs about their back pain will overcome sick leave, because the guidelines put more emphasis on adequate information and education.

Randomized trials of educational interventions suggest that self-management of back pain as important in achieving good outcomes^[11]. Supervised programs that were individually tailored for LBP, seemed to be more effective than other delivery modes. Evidences support the use of advice to remain active in addition to specific advice relating to the most appropriate exercise, and or functional activities to promote active self management.

Clinical trials stated that level of improvement of an information booklet on back care and advice is modest, but the cost and complexity of the intervention is minimal. Therefore, the implications and generalizability of this intervention are substantial^[12].

A simple but fundamental change from the traditional prescription of bed rest to positive advice about staying active could improve clinical outcomes and reduce the personal and social impact of back pain. Evidence also indicates that the back school (Physiotherapy & back education) is an effective tool for influencing lifting posture, activities of daily living, and reduce the sickness absence^[13].

Prevention of recurrent LBP is therefore an important issue in both an individual and a socioeconomic perspective. Hence considering the above statements, the study is intended to find the most effective approach in delivering the back care advice, patient's adherence, and reducing disability related to low back pain.

According to W.H.O, international classification of health workers is largely based on the International Standard Classification of Occupations (ISCO, 2008 revision), a system for classifying and aggregating occupational information obtained by means of population censuses and other statistical surveys, as well as from administrative records.^[8]

The classification of health workers makes occupation categories into five broad groupings: health professionals, health associate professionals, personal care workers in health services, health management and support personnel, and other health service providers not elsewhere classified.

Most of the back pain reasons among health care providers are due to environmental, physical and psychological over stress.

Symptoms

1. Pain is usually cyclic.
2. Low back pain is often referred to buttocks and thighs.
3. Morning stiffness or pain is common.
4. Start pain (i.e., when starting the movement) is common.
5. There is pain on forward flexion and often also in returning to erect position.
6. Pain is often produced and aggravated by extension, side flexion, rotation, standing, walking, sitting, and exercise in general.
7. Pain usually becomes worse over the course of the day.
8. Pain is relieved by change in position.
9. Pain is relieved by lying down especially in foetal position.

DISABILITY

According to W.H.O (1976) disability is defined as “ Any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.”^[9]

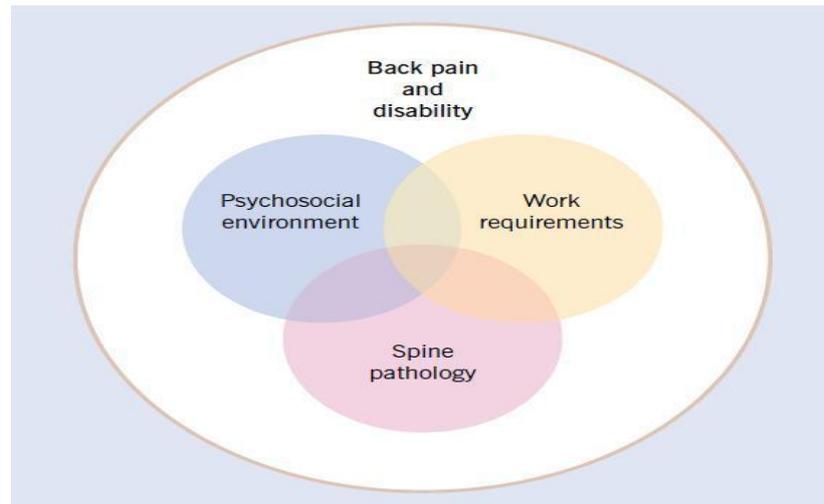


Figure 6: This model is one manner of visualizing the interaction of spine pathology, work requirements and psychosocial factors in the genesis of back pain and its resulting disability

Previous studies stated nurses and nursing aides have the highest rates of work-related musculoskeletal disorders (WMD) in medical services.^[12] Some studies have reported that NAs working at nursing homes are likely to suffer more frequently from low back pain (LBP) than registered nurses.^[11,13] Physical therapists also are exposed to many of the same occupational risk factors leading to WMD, especially with regard to the low back.^[13]

Many previous studies have been conducted to identify the roles of individual and occupational factors as possible causes of LBP among nursing staff. Some previous studies have shown that ergonomic risk factors, including physical exertion at work, frequent bending and twisting, heavy lifting and other patient-handling tasks, all play important roles in contributing to the occurrence of LBP.^[14]

Elements of physiotherapy practice which have been suggested as risk factors include: treatments which demand repetitive movements or continuous bending, lifting/transferring dependent patients, responding to unanticipated or sudden movements by patients, performing manual therapy, restricted work place, understaffing, age and sex. Scientific literature from various parts of the world has also reported significant association between occupational risk factors involving high repetition rates, excessive forces, and awkward postures and musculoskeletal disorders.^[15]

Need of the study: Low back pain is a common health and social problem associated with disability and absence from work. “Lifetime prevalence of spinal pain has been reported as 45 to 85 percent, with as many as 60 percent of patients continuing to have chronic pain five years or longer after the initial episode”^[1].

The long term and disabling conditions of chronic and recurrent low back problems are of major concern, both from a cost perspective and in terms of morbidity^[2]. It's obvious that in low back pain patients, the severity of pain determines the degree of disability and that both pain and disability determine loss of quality of life ^[3].

Epidemiology studies of musculoskeletal pain (MSP) among Dental, Nursing ,Pharmacy and Physiotherapy colleges in India, reveled the prevalence of 58.7 % paramedical students reported to have low back pain, occurs early in training ^[4]. Prevalence of LBP was 34.25%, and was more in 21-24 years age group. About 56.6% of the students reported that LBP has affected their academic performance in classes occasionally, and 31% of the students reported that few occasions they were absent due to LBP. Majority of the students possess average amount of knowledge regarding LBP^[5].

Nonspecific low back pain is a common and recurring symptom that most people usually deal with themselves ^[6]. It is also defined as low back pain without a specified physical cause (eg. Nerve root compression, trauma, infection, tumour) ^[3].

Returning to work is often difficult for patients with prolonged low back pain. Low cost interventions for such patients would thus be highly welcome and, in fact, simple interventions aimed at reducing fears have already been shown to reduce sick leave among patients with subacute low back pain^[7,8].

Evidences support the use of advice to remain active in addition to specific advice relating to the most appropriate exercise, and or functional activities to promote active self management⁹. NS-LBP- Guidelines suggest that the intervention should consist of an active approach in which the patient learns to take control over his or her back pain. Patients' coping strategy and beliefs about their back pain will overcome sick leave, because the guidelines put more emphasis on adequate information and education ^[10].

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Prevention of recurrent LBP is therefore an important issue in both an individual and a socioeconomic perspective. Hence considering the above statements, the study is intended to find the most effective approach in delivering the back care advice, patient's adherence, and reducing disability related to low back pain.

Objectives of the study

1. To find the effectiveness of Active strategy about back care advice in reducing disability in nonspecific low back pain among paramedical students.
2. To find the effectiveness of Passive strategy about back care advice in reducing disability in nonspecific low back pain among paramedical students.
3. To compare the effectiveness of Active versus Passive strategy about back care advice in reducing disability in nonspecific low back pain among paramedical students.

Hypothesis

- **Alternative hypothesis:** There will be a significant difference between Active and Passive strategies about back care advice in reducing disability in nonspecific low back pain among paramedical students.
- **Null hypothesis:** There will be No significant difference between Active and Passive strategies about back care advice in reducing disability in nonspecific low back pain

among paramedical students.

Methodology

POPULATION

Non-Specific- LBP among Paramedical Students..

STUDY DESIGN

Comparative Experimental Study

SOURCE OF DATA

The Oxford Out Patient department of Physiotherapy and Rehabilitation.

MATERIALS

Couch & Mat

Table, chair, Black Board.

Spine Model & Spine Chart.

Back Care Booklet.

SAMPLING METHOD AND SAMPLE SIZE

a) Sampling method: Simple random sampling (lottery method).

b) Sample size: 30 subjects

Group A : 15 Subjects

Group B : 15 Subjects.

SELECTION CRITERIA

Inclusive criteria

A. Subjects with subacute nonspecific low back pain among paramedical student.

B. Age : between 20 – 25 years.

C. Both Gender.

D. Subjects fulfilling Keele STarT Back(6 items) Screening Tool.

E. Subjects willing to participate.

Exclusive criteria

A. Subjects taking Pain medication.

B. Acute or chronic LBP.

C. Any co-morbid medical conditions.

- D. Any restrictions in doing exercises.
- E. Subjects undergone any surgery for the back or abdomen.
- F. Previous fractures in and around lower back or in lower extremity.

PROCEDURE

The subjects will be selected based on selection criteria. Informed consent will be obtained from them. Subjects will be divided into two groups randomly by (Lottery method).

Group A (Active Strategy – Under Physiotherapist Supervision) – 15 subjects

Group B (Passive Strategy – Information Booklet) – 15 subjects.

All subjects will be asked to complete Roland Morris Questionnaire and SF 36 Questionnaire to document their level of disability, and General Health & quality of life, respectively).

The treatment protocol as follows.

Common Protocol : (Program tailored, according to each subjects)

(Based on the References ^[43 &44])

1. Low Back Awareness: subjects were educated for structure and function of the spine and they were explained about the causes of back pain with the spine model and spine chart.

2. Postural Advice: subjects were demonstrated and practiced the following postures. Sitting, standing, lying, bending.

Lying: Subjects were educated for the maintenance of their posture during side lying position they advised to use, the firm base and matters. Sufficient pillows to fill the gap between their back and shoulder similarly they were advised to maintain spine in straight line by placing roll support in their lumber region and pillow between the knees.

Sitting posture: subject were educated to avoid sitting for long time, they asked to support their spine at waist level with a small cushion to support the inward curve of your back.

-Use an upright chair.

-Try a folded towel or use small pillow to your lower back. Sitting for a long time. -Get up and stretch every 20-30 minutes.

Standing posture: subject were advice to avoid forward standing posture for long time and

were educated to modify their work surface.

Ergonomic Advice : The following instructions were given to subjects to maintain posture during work or any Activity.^[26,27]

- Keep the body in alignment while sitting in office chair and while standing.
- Use posture friendly props and Ergonomic office chair while sitting.
- Increase awareness of posture and ergonomics in everyday settings.
- Exercise regularly to prevent injury and promote good posture.
- Wear supportive footwear When standing.
- Maintain overall relaxed posture to avoid restricting movement by clenching muscle and adopting an unnatural, stiff posture.
- Don't work for long period on laptop.
- Take regular breaks.
- Maintain proper posture and ergonomics when in motion.

Rest regimen: Subjects were suggested to do learn how to reduce stress. Worry: being tense. By Using relaxation techniques like Diaphragmatic breathing exercises, simple stretches, sighing etc.

3.Core strengthening : Training the core muscles of Low back.
(Standard Protocol).

EXERCISE PROTOCOL

Core stability exercises

CAT STRETCH: Starting position: Four point kneeling position maintain the neutral spine posture. Instruction: Subjects were asked to make a hump at the spine.

BACK EXTENSION: Starting position: prone lying.

Instruction: Subjects were asked to lift their head and shoulders off the mat one vertebra at a time.

PELVIC TILT: Starting position: supine lying.

Instructions: subjects were asked to slowly tilt the pelvis in anterior and posterior direction.

SEGMENTAL BRIDGE: Starting position: In supine lying with both feet at hip distance apart.

Instructions: Subjects were asked to tilt the pelvis and slowly lift the pelvis off the mat. They were asked to move one vertebra at a time.

TRANSVERSUS ABDOMINUS (TA) ACTIVATION

Starting position: Supine.

Subjects were instructed to draw in their pelvic floor. Also draw the belly buttons in and hold muscle contraction for 10 seconds.

TRANSVERSUS ABDOMINUS MARCHING

Starting position: Patient lies supine and draws the pelvic floor and belly button in.

Instructions: Subjects were asked to maintain the muscle contraction and lift one leg up, hold and then return to starting position. (Alternate legs)

FALL OUT

Starting position: supine lying, with both the feet and knee together.

Instructions: Subjects were asked to draw in the pelvic floor and also the belly button. Then they were asked to slowly shift the knees 3 cms to the side while keeping the body still. Return to the middle and repeat on the other side.

MODIFIED CRUNCH

Starting position: patient should lie on their back with the hands by their ears. Instruction: Subjects were instructed to lift up the head and shoulder off the mat. -The number of repetitions is intentionally kept low to reduce the risk of an overuse injury and also to ensure that stabilizing muscles do not become fatigued.

-Breath should not hold at any stage.

-Core stability exercises conducted without shoes.

-The core stability exercise advisable to start with the beginner programme.

Stretching: Based on assessment (may vary with subjects), like Hamstring, Hip flexors and low back muscles.

Stretching for lower back and hip: subject were advice to lie on their back and instructed knees bent ,feet flat on the floor arms at the side, Raise Both Knees one at a time to the chest and asked to hold with hands, than bring legs to the floor and rest.

Stretching for Hip flexor: subjects were instructed to stand side on the wall with left hand supporting body weight .then asked to flex the right leg, and grip ankle with knee flexed. Pull right hip back to the extension, while maintaining correct spinal alignment.

Subjects were instructed to do half kneeling with right leg in front, and tighten the abdominal muscles to stabilize the trunk, then asked to press right leg forwards, then forcing left hip into extension.

Variations: support one hand on a stool.

Stretching for Hamstrings Muscle: Subjects were instructed to sit with the right leg straight and left leg comfortably bent, reach forward with the right hand to grip the sole of right foot. And were asked to press left hand on right knee to maintain knee extension, maintain spinal alignment, gently curving throughout the whole spine.

Activities of IADL & BADL: Carrying, lifting, shifting, using utensils, sleeping,etc.

- **Carrying:** subjects were instructed to move closer to the object, and subjects were advice to maintain the spine in erect position and flex Hip and Knee in close□kinematic chain, and carry the object closer to the body or lift the object from an appropriate height such that minimal flexion occur at the spine.
- **Lifting:** subjects were advice to analyze their own strength: what they are lifting can be handled or not. Always lift and carry close to the body. Bend the knees and make legs do the work don't twist your back – turn with the feet.
- **Using utensils:** subjects were advice to used one foot on a low box or stool, while standing for long time, or advised to modify work surface at comfortable height



Fig7: Low Back Education Advice (ERGONOMIC&LIFTING)

Group A: (Active Strategy – Under Physiotherapist Supervision) – 15 subjects The subjects will follow the common protocol, under the direct supervision of the Physiotherapist for 2 weeks continuously.

Treatment Duration: 20 Minutes of Theory Session & 40 minutes of Exercise Training.

No. Of. Sessions: 2 weeks (5 Sessions per week and 1 session per day).

Group B (Passive Strategy – Information Booklet) – 15 subjects.

The subjects will follow the common protocol. All subjects will attend the first session to undergo common protocol training (20 Minutes of theory session & 40 Minutes of Practical training), individualized to each subjects and then, the informative Booklet in printed form with sample pictures will be given to each subject to practice every day for 2 weeks.

On completing 2 weeks, all the subjects will be asked to complete the Roland Morris Questionnaire and SF 36 Questionnaire, to document their level of disability and quality of life, respectively).

RESULT

Table 2: Distribution of study samples by study groups and gender

Gender	Group A	%	Group B	%	Total
Male	7	46.67	8	53.33	15
Female	8	53.33	7	46.67	15
Total	15	100.00	15	100.00	30

Table 3: Mean and SD age of samples in two groups by gender.

Summary	Group A	Group B	Total
Mean age	22.47	22.73	22.60
SD age	1.81	1.87	1.81

Table 4: Comparison of pretest and posttest scores of Roland - Morris Low Back Pain Disability Questionnaire in group A and group B using paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	17.13	1.13					
	Posttest	8.20	1.82	8.93	1.79	52.14	19.3125	0.0000*
Group B	Pretest	17.27	1.22					
	Posttest	8.53	2.64	8.73	2.40	50.58	14.0678	0.0000*

*p<0.05

From the above result it can be seen that,

- A significant difference was observed between pre and posttest scores in group A ($t=19.3125$, $p<0.05$) at 5% level of significance,. It means that, the posttest scores are significantly smaller as compared to pretest scores in group A.
- A significant difference was observed between pre and posttest scores in group B ($t=14.0678$, $p<0.05$) at 5% level of significance,. It means that, the posttest scores n are significantly smaller as compared to pretest scores in group B.

Table 5: Comparison of group A and group B with respect to Roland- Morris Low Back Pain Disability Questionnaire scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	n	Mean	SD	t-value	p-value
Pretest	Group A	15	17.13	1.13	-0.3107	0.7583
	Group B	15	17.27	1.22		
Posttest	Group A	15	8.20	1.82	-0.4024	0.6905
	Group B	15	8.53	2.64		
Difference	Group A	15	8.93	1.79	0.2583	0.7980
	Group B	15	8.73	2.40		

- There is no significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest scores ($t= 0.2583$, $p<0.05$) at 5% level of significance,. It means that, the gain scores are not significantly different between group A and group B.

Table 6: Comparison of pretest and posttest scores of SF-36 (Category-1) Physical function in group A and group B by paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	70.00	12.39					
	Posttest	86.33	10.93	-	4.81	-23.33	-13.1631	0.0000*
				16.33				
Group B	Pretest	68.67	14.57					
	Posttest	72.33	9.61	-3.67	5.81	-5.34	-2.4423	0.0285*
* $p<0.05$								

From the above result it can be seen that,

- A significant difference was observed between pre and posttest scores of Physical function in group A ($t=-13.1631$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Physical function are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of Physical function in group B ($t=-2.4423$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Physical function are significantly smaller as compared to posttest scores in group B.

Table 7: Comparison of group A and group B with respect SF-36 (Category-1) Physical function scores at pretest, posttest and their difference by unpaired t test.

Variable	Groups	n	Mean	SD	t-value	p-value
Pretest	Group A	15	70.00	12.39	0.2699	0.7892
	Group B	15	68.67	14.57		
Posttest	Group A	15	86.33	10.93	3.7248	0.0009*
	Group B	15	72.33	9.61		
Difference	Group A	15	16.33	4.81	6.5033	0.0000*
	Group B	15	3.67	5.81		

* $p<0.05$

From the above result it can be seen that,

- A non-significant difference was observed between group A and groups B with respect to pretest Physical function scores ($t=0.2699$, $p>0.05$) at 5% level of significance,. It means that, the pretest scores of Physical function in group A and groups B are similar.
- A significant difference was observed between group A and groups B with respect to posttest Physical function scores ($t=3.7248$, $p<0.05$) at 5% level of significance,. It means that, the posttest scores of Physical function are significantly higher in group A as compared to groups B.
- A significant difference was observed between group A and groups B with respect to gain

scores from pretest and posttest of Physical function scores ($t=6.5033$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of Physical function are significantly higher in group A as compared to groups B.

Table 8: Comparison of pretest and posttest scores SF-36 (Category-2) Physical health in group A and group B by paired t test.

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	36.67	35.19					
	Posttest	68.33	19.97	-31.67	19.97	-86.36	-6.1414	0.0000*
Group B	Pretest	40.00	38.73					
	Posttest	55.00	28.66	-15.00	20.70	-37.50	-2.8062	0.0140*
* $p<0.05$								

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of Physical health in group A ($t=-6.1414$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Physical health are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of Physical health in group B ($t=-2.8062$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Physical health are significantly smaller as compared to posttest scores in group B.

Table 9: Comparison of group A and group B with respect to SF-36 (Category-2) Physical health scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	36.67	35.19	-0.2467	0.8069
	Group B	15	40.00	38.73		
Posttest	Group A	15	68.33	19.97	1.4783	0.1505
	Group B	15	55.00	28.66		
Difference	Group A	15	31.67	19.97	2.2441	0.0329*
	Group B	15	15.00	20.70		

* $p<0.05$

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of Physical health scores ($t=2.2441$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of Physical health are significantly higher in group A as compared to groups B.

Table10: Comparison of pretest and posttest scores SF-36 (category 3) Emotional problem in group A and group B by paired test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	53.40	39.51					
	Posttest	71.27	21.37	-17.87	24.90	-33.46	-2.7791	0.0148*
Group B	Pretest	60.13	31.45					
	Posttest	62.33	21.51	-2.20	23.63	-3.66	-0.3606	0.7238

* $p<0.05$

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of emotional problem in group A ($t=2.7791$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of emotional problem are significantly smaller as compared to posttest scores in group A.
- There is no significant difference was observed between pre and posttest scores emotional problem of in group B ($t=0.3606$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of emotional problem are not significantly different as compared to posttest scores in group B.

Table11: Comparison of group A and group B with respect SF-36(category 3) Emotional problem scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	53.40	39.51	-0.5164	0.6096
	Group B	15	60.13	31.45		
Posttest	Group A	15	71.27	21.37	1.1411	0.2635
	Group B	15	62.33	21.51		
Difference	Group A	15	17.87	24.90	1.7675	0.0880
	Group B	15	2.20	23.63		

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of emotional problem scores ($t=1.7675$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of emotional problem are significantly higher in group A as compared to groups B.

Table12: Comparison of pretest and posttest scores SF-36f (category 4) Energy/fatigue in group A and group B by paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	61.00	12.42				-11.1446	0.0000*
	Posttest	83.33	9.19	-22.33	7.76	-36.61		
Group B	Pretest	62.67	11.47				-5.2643	0.0001*
	Posttest	68.33	8.80	-5.67	4.17	-9.04		

*p<0.05

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of energy/fatigue in group A ($t=-11.1446$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of energy/fatigue are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of energy/fatigue in group B ($t=-5.2643$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of energy/fatigue are significantly smaller as compared to posttest scores in group B.

Table13: Comparison of group A and group B with respect SF-36 (category 4) Energy/fatigue scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	61.00	12.42	-0.3817	0.7055
	Group B	15	62.67	11.47		
Posttest	Group A	15	83.33	9.19	4.5657	0.0001*
	Group B	15	68.33	8.80		
Difference	Group A	15	22.33	7.76	7.3267	0.0000*
	Group B	15	5.67	4.17		

*p<0.05

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of energy /fatigue scores ($t=7.3267$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of energy /fatigue are significantly higher in group A as compared to groups B.

Table14: Comparison of pretest and posttest scores SF-36(category 5) of Emotional well being in group A and group B by paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	68.00	11.31				-4.3457	0.0007*
	Posttest	78.00	7.29	-10.00	8.91	-14.71		
Group B	Pretest	73.07	12.14				0.0000	1.0000
	Posttest	73.07	12.14	0.00	0.00	0.00		

* $p<0.05$

From the above results it can be seen that,: A significant difference was observed between pre and posttest scores of Emotional well being in group A ($t=-4.3457$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Emotional well being are significantly smaller as compared to posttest scores in group A.

- There is no significant difference was observed between pre and posttest scores of Emotional well being in group B ($t=-0.0000$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Emotional well being is not significantly different as compared to posttest scores in group B.

Table 15: Comparison of group A and group B with respect SF-36 SF-36(category 5) Emotional well being scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	68.00	11.31	-1.1826	0.2469
	Group B	15	73.07	12.14		
Posttest	Group A	15	78.00	7.29	1.3494	0.1880
	Group B	15	73.07	12.14		
Difference	Group A	15	10.00	8.91	4.3457	0.0002*
	Group B	15	0.00	0.00		
* $p<0.05$						

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of Emotional well being scores ($t=4.3457$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of Emotional well being are significantly higher in group A as compared to groups B.

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of Social functioning in group A ($t=-8.8313$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Social functioning are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of Social functioning in group B ($t=-3.4959$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of Social functioning are significantly smaller as compared to posttest scores in group B.

Table17: Comparison of group A and group B with respect SF-36(category 7) to Social functioning scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	63.53	13.87	-0.4624	0.6474
	Group B	15	66.07	16.06		
Posttest	Group A	15	81.93	13.18	2.1674	0.0389*
	Group B	15	72.00	11.89		
Difference	Group A	15	18.40	8.07	4.6391	0.0001*
	Group B	15	5.93	6.57		

* $p<0.05$

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of Social functioning scores ($t=4.6391$, $p<0.05$) at 5% level of significance,. It means that, the gain scores of Social functioning are significantly higher in group A as compared to groups B.

Table18: Comparison of pretest and posttest scores SF-36(category 7) pain (%) in group A and group B by paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	48.67	18.85				-9.1575	0.0000*
	Posttest	74.07	12.35	-25.40	10.74	-52.19		
Group B	Pretest	53.13	17.82				-3.9738	0.0014*
	Posttest	62.73	10.53	-9.60	9.36	-18.07		

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of pain in group A ($t=-9.1575$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of pain are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of pain in group B ($t=-39738$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of pain are significantly smaller as compared to posttest scores in group B.

Table19: Comparison of group A and group B with respect SF-36(category 7) pain scores (%) at pretest, posttest and their difference by unpaired t test

Variable	Groups	N	Mean	SD	t-value	p-value
Pretest	Group A	15	48.67	18.85	-0.6670	0.5102
	Group B	15	53.13	17.82		
Posttest	Group A	15	74.07	12.35	2.7052	0.0115*
	Group B	15	62.73	10.53		
Difference	Group A	15	25.40	10.74	4.2955	0.0002*
	Group B	15	9.60	9.36		

* $p<0.05$

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of pain scores ($t=4.2955$, $p<0.05$) at 5% level of

significance,. It means that, the gain scores of pain are significantly higher in group A as compared to groups B.

Table20: Comparison of pretest and posttest scores SF-36(category 8) General health in group A and group B by paired t test

Variable	Groups	Mean	SD	Mean diff	SD diff	% of change	Paired t	p-value
Group A	Pretest	55.33	12.17				-11.3109	0.0000*
	Posttest	78.00	8.62	-22.67	7.76	-40.96		
Group B	Pretest	56.00	11.53				-4.6574	0.0004*
	Posttest	65.33	8.96	-9.33	7.76	-16.67		

*p<0.05

From the above results it can be seen that,

- A significant difference was observed between pre and posttest scores of General health in group A ($t=-11.3109$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of General health are significantly smaller as compared to posttest scores in group A.
- A significant difference was observed between pre and posttest scores of General health in group B ($t=-4.6574$, $p<0.05$) at 5% level of significance,. It means that, the pretest scores of General health are significantly smaller as compared to posttest scores in group B.

Table21: Comparison of group A and group B with respect SF-36(category 7) General health scores at pretest, posttest and their difference by unpaired t test

Variable	Groups	n	Mean	SD	t-value	p-value
Pretest	Group A	15	55.33	12.17	-0.1540	0.8787
	Group B	15	56.00	11.53		
Posttest	Group A	15	78.00	8.62	3.9465	0.0005*
	Group B	15	65.33	8.96		
Difference	Group A	15	22.67	7.76	4.7047	0.0001*
	Group B	15	9.33	7.76		

*p<0.05

- A significant difference was observed between group A and groups B with respect to gain scores from pretest and posttest of General health scores ($t=4.7047$, $p<0.05$) at 5% level

of significance,. It means that, the gain scores of General health are significantly higher in group A as compared to groups B.

DISCUSSION

The socio-economic burden of low back pain (LBP) continues to increase owing largely to disproportionate rises in LBP disability. Work disability in the developed countries reported to have escalating few million every year. Whilst it is estimated that about 90% of acute back pain patients return to work within three months, many experience symptom recurrence and functional limitation (Ehrlich, 2003). Acute pain becomes chronic on repeated recurrences.

Many studies have stated that Back School program, advice and education are effective in terms of implementation, cost to the patients and economics of the country. Advice constitutes all the information that the patient receives verbally, in written, audiovisual, or electronic format during the course of treatment. The use of

‘The Back Book’, produced by the Royal College of General Practitioners (RCGP), has been widely endorsed as a means of encouraging LBP patients to stay active (Roland *et al.*, 2004). At present, the provision of advice to promote an understanding of LBP, and the importance of the patient playing an active role in their recovery, is largely dependent on the individual clinician, their available time and resource (Kerssens *et al.*, 1999; Trede, 2000).

This study examined the effect of active strategy (Group A) –physiotherapist supervised versus passive strategy (Group B) – printed informative booklet to the paramedical students suffering from subacute low back pain. The program was designed with back advice as an adjunct with exercise. The outcome measures were Roland –Morris Low Back Disability Questionnaire, which focuses the back specific functions, and Rand SF- 36 focuses health-related quality of life, it gives a more comprehensive assessment of the patient's health status than ‘back-specific’ instruments, and can reflect the overall impact of the patient's health status (including co-morbidities) on their role in society.

Alkbaladejo et al mentioned that active management had shown consistent improvement in disability, Pain & QOL. The current study had resulted that, both Active Strategy & Passive Strategy had shown reduction in disability percentage measured by Roland – Morris Low Back Pain Disability Questionnaire. Both the groups A & B had shown considerable reduction in disability of 52.14 % & 50.58%. But then there is no statistical difference

between groups A & B, the mean difference were 8.93 & 8.73 respectively. Hence both the strategies were equally effective in improving back specific function.

Rand SF 36 was used as an other outcome measure to assess the health related Quality of life, which has 8 components (Physical function, Physical health, emotion problem, Energy & fatigue, Emotional well being. Social function, Pain & General health). Group A had shown improvement in all the components. Group B also had improved in almost all the components except emotional well being & emotional problem. Group A (active strategy) was better in improving all the components in QOL & Health, when comparing Group B (Passive Strategy).

North American spine society has stated that it is important to remember that there is a dynamic relationship between state of mind (eg, stress level) and physical condition (eg, pain). Pain can cause stress, which causes more pain, which causes more stress, and so on. The more chronic this vicious cycle becomes, the more likely the emotional distress will increase. This cycle has to be broken at the earliest. Studies have found that physiotherapist interaction can modify the emotional issues and influences the positive outcome in patients.

Burton AK et al., stated that Psychosocial factors have been shown to be associated with the development of disability with cLBP, and the best individualized factors are anxiety, depression, coping, and fear of and belief about pain. Providing advice to stay active and information about how to cope with pain has been shown to modify patients' fears, avoidance attitudes and beliefs. The current study subjects in Group A had improved better in all the components esp. in emotional well being and emotional problem. Active strategy (Physiotherapist supervision) had played a pivotal role in patient information and education could have greatly influence the outcome in LBP.

Information booklet has shown improvement in almost all aspects and it could be used as positive tool for NSLBP. **Coudeyre E, Tubach F et al** had stated that simple information booklet is effective in improving pain persistence in low back pain subjects. He mentioned that it is a low-tech and easy-to-disseminate and have enormous promise in LBP interventions. But the cost and complexity of the intervention is minimal. Therefore, the implications and generalizability of this intervention are substantial.

Dianne Liddle et al, conducted a systematic review and stated that, advice as part of a back

school was most effective for improving back-specific function in subacute LBP; these trials generally demonstrated long-term positive results. The effectiveness of treatment for subacute symptoms will directly influence the development of chronicity, these results would suggest that education and awareness of the causes and consequences of back pain may be a valuable treatment component for this patient subgroup.

The current study also focused on advice and back school program based on Bredo Glomsrod et al., and A M Burton. Though both the group had improved in health related QOL and reduction in disability, Active strategy (Group A) had shown statistically significant improvement.

Limitation

- Small and specific sample (paramedical students) and hence it cannot be generalized to the other NSLBP.
- Small sample size.
- Control group was included, would have been better for comparison.
- Passive strategy groups had been instructed to telephone and clarify their doubts, if any, but no one had telephoned. May be due to cost etc. which might have influenced the results in emotional component in SF^[36].

Recommendation

- Back School program video format can be given and study the effect.
- Study can be conducted to different population and age groups.
- Study can be conducted for others types of LBP subjects.
- Psycho-social beliefs using the Fear Avoidance Beliefs Questionnaire and the Back Beliefs Questionnaire would be good to assess the psychometric aspects.
- Sickness absenteeism can also be added as an outcome measure among working population.

CONCLUSION

Back care advice as an adjunct with exercise is proved to be effective tool in the management

of low back pain. The study concludes that there is a statistically significant difference in improving health related QOL (Rand SF 36) in Group A (Active strategy – Under physiotherapist supervision).

However Low Back Disability reduction between Group A (Active strategy) and Group B (Passive strategy) had not shown any statistical difference between them. Hence information booklet can also be used to improve back specific function in the management of subacute LBP among paramedical students. However further study is warranted.

SUMMARY

This study examined the effect of active strategy (Group A) – physiotherapist supervised versus passive strategy (Group B) – printed informative booklet about back care advice, ergonomics and exercise to the paramedical students suffering from subacute low back pain. The program was designed with back advice as an adjunct with exercise. The outcome measures were Roland –Morris Low Back Disability Questionnaire, which focuses the back specific functions, and Rand SF- 36 focuses health- related quality of life, it gives a more comprehensive assessment of the patient's health status than „back-specific“ instruments, and can reflect the overall impact of the patient's health status (including co-morbidities) on their role in society. The results had shown that both the groups had shown reduction in disability but there is no statistically significant difference between groups. However Group A had shown statistically significant difference in improving health related QOL (Rand SF 36) than Group B.

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