

EFFECTIVENESS OF ERGONOMICS TO REDUCE LOW BACK PAIN IN POST MENOPUSAL WOMAN.

Physiotherapy

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KEYWORDS

INTRODUCTION

Low back pain, typically defined as pain below the costal margin and above the inferior gluteal folds, with or without leg pain.^[1] It is classified as specific pain that are caused by specific pathophysiological mechanisms of non-spinal or spinal origin.^[2] The most common form of low back pain is the one that is called "Nonspecific low back pain" and is defined as "Low back pain not attributed to recognizable, known specific pathology". Nonspecific Low Back Pain also described as "simple backache", the everyday bodily symptom that most adults get at some time in their life. This is common "Mechanical" back pain of musculoskeletal origin in which symptoms vary with physical activity. Clinically, simple backache commonly is related to physical "strains", although these often are normal spontaneously.^[3] daily activities, and perhaps in reality, it usually develops. Ergonomic is defined as "That branch of science and technology that includes what is known and theorized about human behavioral and biological characteristics that can be validly applied to the specification design evaluation operation and maintenance of products and systems to enhance safe effective and satisfying use by individuals groups and organizations."^[4] In order to prevent occupational low back pain, ergonomic interventions are frequently implemented at the workplace to reduce biomechanical and psychological load.^[5]

Well-organized work conditions are the essential factor in providing a good quality of life. The field that takes care of these conditions and guides adjustments to workstations is called work ergonomics. Ergonomics is the study of the interactions between people and objects, with the goal of making these interactions safer and more efficient.^[6]

Menopause means permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity. It is the point of time when last and final menstruation occurs.^[7] As such a, women is declared to have attained menopause is the phase of life that come after the menopause.^[8]

Study Design And Setting :-

- **Population:-** Post Menopausal Woman
- **Study Design:** An Experimental Study
- **Study Population:** Post Menopausal Women
- **Sample Size:** 30 patients
- **Study Duration:** 4 Weeks
- **Study Setting:** This study was conducted at Arihant Hospital, Gandhinagar.
- **Sampling Technique :** Simple random sampling

Selection Criteria

- **Inclusion Criteria:**
 - Post menopausal women (ceasing of menstruation since last 2 to 5 years)
- **Gender :-** Female
- **Age :-** 45-55 years
- **Cessation Of Menstruation :-** Since last 2 to 5 years
- Low back pain since last 3 months
- Subject willing to participate
- **Exclusion Criteria:**
 - Post surgical pain

- Recent trauma
- Recent fracture
- Patients with neurological problems
- Patients with psychological problems

Outcome Measures :

Numeric Pain Rating Scale(NPRS)

Reliability = (0.67 to 0.96)

Numeric pain rating scale [NPRS] which ranges from no pain = 0 to the worst possible pain = 10, As additional tools in evaluating the status of chronic pain. NPRS is considered to be the most subjective one in that it depends on the sensitivity to pain of each patient.^[9] This means that an NRS score in the 1–5 range corresponds to mild interference with functioning, while scores of 6 and 7 represent moderate interference and a score in the 8–10 range corresponds to severe interference with functioning.^[10]

Methodology

This was an experimental study design. After taking informed consent subject were assessed for inclusion & exclusion criteria & after selection they will be randomly allocated into 2 groups by simple random samples.

- **Group A:** Ergonomics advice + Isometrics exercise.
- **Group B:** Isometrics exercise will be only follow.

Ergonomics & Isometrics exercise will be as given described below.

- **Ergonomics Advice**
- Sit back in the chair and position your thighs horizontal to your knees at hip level.
- Rest your feet comfortably on the floor or on a foot rest.
- Avoid cell phone while using computers or laptops.
- Work in a neutral position.
- Keep materials within easy reach.
- Work at a proper height.
- 7. Keep your environment comfortable.
- 8. Avoid twisting or bending your trunk or neck.
- 9. Lifting an object from floor:
- Position yourself on center and close to object.
- Stand with your feet apart.
- Tighten your stomach muscle.
- Bend your knees, keep the back straight and lift.
- While lifting, do not twist the body.
- 10. While riding two wheelers:
- Keep your back straight.
- Do not bend your elbow.
- Avoid carrying weight on your shoulder and back while riding.



Photo: Ergonomic Advice At Workplace**• Isometrics Exercises :-**

- Heel press exercise
- Knee rolling exercise
- SQE [static quadriceps exercise]
- Hollowing exercise
- Prone back extension
- Superman's exercise

RESULTS

All statistical analysis was done using SPSS 25.0 software for windows. Descriptive analysis was used to obtain mean and standard deviations. The present study, was conducted to Effectiveness Of Ergonomics To Reduce LowBack Pain In Post Menopausal Women. 30 patients were divided into 2 groups; Group-A patients were given of Isometrics exercise will be only follow. Group-B patients were given to Ergonomics advice + Isometrics exercise. Pre and post intervention outcome measures were evaluated before and after completion of the treatment program. Outcome measures evaluated and analyzed are: Pain by Numerical Pain Rating Scale Out of 30 patients, [Group A = 15, Group B = 15] completed the study for 6 months. Data of 30 patients were analyzed by statistical package of social science version 25 [SPSS 25]. Level of significance was at 5% with the confidence interval 95%. Data was not normally distributed for all the outcome measures. So, nonparametric tests were applied for Intra group and Inter group analyses. Data analysis was done after 4 weeks of intervention. Wilcoxon Signed Rank test applied to analyze pre and post outcome measure within group, while between group analyses was done using Mann Whitney U test for all outcome measures.

Table. Age distribution

	Group A	Group B
Number	15	15
Mean Age	52.06	51.58
Standard Deviation	7.20	6.42

Table shows Age of all patients in both the groups. Graph shows age distribution of both the groups.

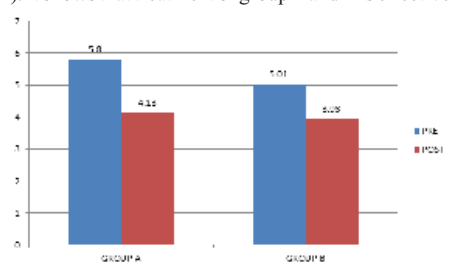
Baseline Data

	NPRS
Group A(Pre)	5.80±1.47
Group B(Pre)	5.01±2.10

Table No. Pre And Post Mean Of Nprs Score Intra Groups

VAS	PRE MEAN±SD	POST MEAN± SD	P VALUE
GROUP A	5.80±1.47	4.13±0.83	<0.01
GROUP B	5.01±2.10	3.93±0.79	<0.01

Table also shows the intra group comparison of NPRS Score in group A and B. This comparison is done through Wilcoxon signed rank test. The intra group comparison of NPRS score shows significant difference ($p < 0.05$) in all groups (Group A: $P = < 0.01$; Group B: $P = < 0.01$). It shows that treatment of group A and B is effective.

**Graph: Comparison of Pre and Post Mean of NPRS score intra groups****Table: Comparison of difference of Mean of NPRS score Inter groups.**

	MEAN	STD.DEV IATION	MAN WHITNEY	P- VALUE
NPRS				
GROUP A	4.13	10.83	67.00	0.044
GROUP B	3.93	0.79		

Table shows the inter group comparison of NPRS score in Group A & B. This comparison is done through non parametric Man-whitney U

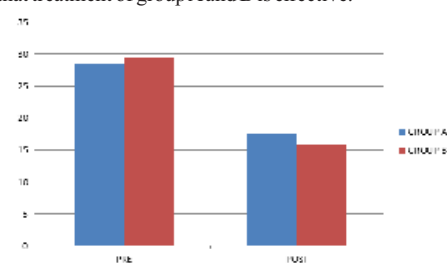
test. The p value comparing at post treatment score of Group A and B is 0.05 which is suggestive of significant improvement between groups.

Graph : Comparison of difference of Mean of NPRS scores Inter groups.

Table No. Pre and Post Mean of ODI score Intra groups

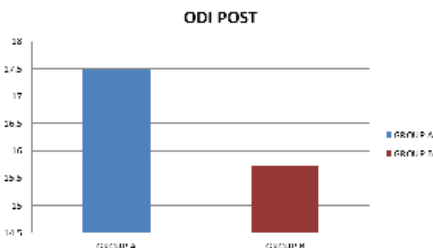
VAS	PRE MEAN±SD	POST MEAN± SD	P VALUE
GROUP A	28.55±1.60	17.48±2.250	<0.01
GROUP B	29.56±2.60	15.71±1.35	<0.01

Table also shows the intra group comparison of ODI Score in group A and B. This comparison is done through Wilcoxon signed rank test. The intra group comparison of ODI score shows significant difference ($p < 0.05$) in all groups (Group A: $P = < 0.01$; Group B: $P = < 0.01$). It shows that treatment of group A and B is effective.

**Graph 3: Mean value of ODI****Table: Comparison of difference of Mean of ODI score Inter groups.**

	MEAN	STD.DEV IATION	MAN WHITNEY	P- VALUE
ODI				
GROUP A	17.48	10.83	68.00	0.04
GROUP B	15.71	0.79		

Table shows the inter group comparison of ODI score in Group A & B. This comparison is done through non parametric Man-whitney U test. The p value comparing at post treatment score of Group A and B is 0.05 which is suggestive of significant improvement between groups.

**DISCUSSION**

Various studies¹⁻³ reported that LBP is one of the most common causes of hospital visits and that it is the leading cause of activity limitations and work absences in many parts of the world. LBP poses a significant economic threat to the individual, family, workplace, and society. Initially considered to be a problem confined to developed countries, studies have now revealed an increasing prevalence in developing countries^{15,16}. Although LBP can manifest at any age, LBP prevalence is the highest in the third decade of life¹⁷. LBP occurrence at an early age can cause disease progression, resulting in chronic LBP that has the potential to decrease an individual's quality of life⁸. Being a common health issue that affects all age groups, LBP and its risk factors have been evaluated by various authors internationally.

Linton et al.²⁰ and Thomas et al.²¹, which demonstrated a higher incidence in females and who also develop chronic backache compared with males. A meta-analysis by Hoy et al.²² also showed an increased prevalence in females. Shiri et al.²³ conducted a meta-analysis and found that smokers have a higher prevalence and LBP incidence than non-smokers and that the pain is stronger in adolescents than in adults. Static muscle load and flexion of the lumbar spine have been postulated as risk factors for LBP development; thus, prolonged sitting or sitting in an abnormal posture can aggravate LBP²⁵. We found that posture while studying had no effect on LBP occurrence; however, the number of daily hours spent studying had a significant association with LBP. With the increased sedentary life style, low back pain is

getting common among adults as well as older people

CONCLUSION

This study shows that proper teaching of ergonomics along with exercise can reduce low back pain in menopausal women.

Limitations

- Study was conducted at small sample size.
- At the time of the study, these women often worked for long periods of time, which could be a major contributing factor to lbp occurrence. Thus, these subjects would have likely experienced lack of ergonomics and other advices, which may have exacerbated lbp.
- Our study did not include sedentary lifestyle as a risk factor for lbp.

Future Recommendations

"It is recommended that further studies be conducted to explore the potential benefits of combining ergonomics and yoga for reducing low back pain in post-menopausal women."

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