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Effectiveness of Global Posture Re-education and McKenzie technique in Non-Specific Low Back Pain

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Abstract

Low back pain is a highly prevalent and disabling condition worldwide. Despite plenty of research having been conducted among those with non-specific low back pain, there is still a scarcity of research in the application of McKenzie, especially in the primary medical care phase. Besides, the evidence on the effectiveness of intervention in patients with persistent nonspecific low back pain is conflicting because of the significant risk of bias among studies. Thus, the current study was conducted to examine the effectiveness of global postural re-education and the McKenzie technique in patients with non-specific low back pain. The current experimental study was conducted among 30 patients with persistent non-specific low back pain. Participants were randomly divided into two groups (Group A: Mckenzie and global postural education and Group B: Mckenzie only). At the baseline, pain, lumbar-pelvic flexibility, and disability score were taken using the Visual Analogue Scale, modified finger-to-floor test, and Owstery Disability Index, respectively. The intervention was conducted for three weeks. The results were analysed using the descriptive statistics and paired t-test. All the variables showed a high mean value in the post-test when compared to the pre-test values in both Group A and Group B. However, in comparison between pre and post three weeks intervention, Group A showed a significant difference. In conclusion, the current study suggests that the combination of global postural education and McKenzie is more useful and efficient than McKenzie alone among patients with non-specific low back pain.

Keywords

Postural re-education; McKenzie; Low back pain; Disability index; Flexibility

Introduction

Low back pain is a highly prevalent and disabling condition worldwide. Approximately 70-85% of individuals will experience low back pain (LBP) during their lifetime, and over 80% of them will report recurrent episodes (Liddle et al., 2004). In both developed and developing

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nations, low back pain is the most common reason for years of disability (Hoy et al., 2014; Vos et al, 2015). About 8 in 10 people have one or more bouts of low back pain. Non-specific low back pain means that the pain is not due to any specific or underlying disease that can be found. It is thought that in some cases the cause may be a sprain (an over-stretch) of a ligament or muscle.

Global postural reeducation (GPR) is a global approach for the treatment of musculoskeletal diseases. 'Global Postural Reeducation is a physical therapy method developed in France by Philippe-Emmanuel Souchard. By reducing pain and enhancing function, GPR may be a useful technique for treating spinal problems (Lomas-Vega et al., 2017). GPR is an innovative method of posture correction. The GPR deploys itself for its coherent principles based on biomechanics and neuromuscular coordination. This therapeutic approach is based on an integrated idea of the muscular system as formed by muscle chains, which can face shortening resulting from constitutional, behavioural and psychological factors (Souchard et al., 2009). A review of the literature on GPR suggested that this method is indicated not only for people presenting postural ailments, but may also be effective for treating musculoskeletal diseases. Patients treated with GPR group showed apparent improvement in functional status, disability and pain intensity as compared to the motor control exercise in non-specific low back pain patients (Kumar A, 2022)

The scientific evidence to support the use of the McKenzie method is still scarce, particularly in primary medical care (Cherkin et al., 1998). Despite the large amount of evidence regarding LBP management, a definitive conclusion on which is the most appropriate intervention is not yet available. In patients with chronic nonspecific low back pain, McKenzie and stability exercises reduced functional impairment more effectively than traditional exercise programmes (Alhakami, et al., 2019). A systematic review assessed the effects of Global Postural Reeducation (GPR) on patient-reported outcomes in conditions of the musculoskeletal conditions identified that GPR is superior to no treatment (Ferreira et al., 2016). However, the review recommended further studies are required to enhance the available evidence level of GPR. Hence, this study was aimed conducted to compare the effectiveness of GPR & McKenzie technique versus McKenzie technique alone in patients with non-specific low back pain.

Methodology

This experimental study was conducted among 30 patients who were selected through simple random sampling with persistent non-specific low back pain. Both genders were included with age group range from 18-40 years and participants with pain less than 6 weeks were included in this study. The participants were excluded if they have history of spine surgery, central or peripheral neurological signs and rheumatic conditions of spine. The study was approved by ethical committee of Vels Institute of Science of Technology & Advanced Studies. All participants received verbal and written information about the study and signed a consent form. A random drawing from sealed, opaque envelopes was used to divide the participants into groups. A colleague who was not involved in the study prepared the sealed envelopes. Participants were randomly divided into two groups (Group A & Group B). The intervention began one week following allocation and was led by two skilled independent physical therapists with 12-15 years of expertise. Whereas, the outcome evaluation and data collection were carried out by another physical therapist who was blind to the group allocation. Group A received McKenzie exercise and GPR (Anterior muscle chain stretching and its progression,

posterior muscle chain stretching and its progression and posterior muscle chain loading stretching and its progression) whereas Group B received McKenzie exercise only (Extension in lying and standing, flexion in lying and standing, correction of lateral shift and side gliding). The entire baseline (Pre Test values) of pain, lumbar-pelvic flexibility, and disability score were taken using the Visual Analogue Scale (VAS), modified finger-to-floor test and Oswestry Disability Index (ODI) respectively. The ODI is a condition-specific assessment instrument that is suitable for use in clinical practice and is valid, reliable, and responsive (Vianin M. 2008). The reliability of the VAS for disability is moderate to good for patients with chronic musculoskeletal pain. (Boonstra et al., 2008). The intervention was provided weekly 5 days with duration of 60 minutes for a period of three weeks and post-values were taken upon completion.

Data were analyzed using the SPSS 22.0 statistical program. Independent t-test was conducted to compare the differences between two groups on the VAS, ODI and lumbar-pelvic flexibility. Null hypotheses of no difference were rejected if p-values were less than 0.05.

Results and Discussion

The majority participants in the study were female (56.66%), aged between 36-40 (43.33%) and 60% of them are office workers. (Table 1)

Table 1. Demographic characteristics of participants

Variables	Frequency (n (%)
Gender	
Male	13 (43.33)
Female	17 (56.66)
Age	
20-25	3 (10)
26-30	6 (20)
31-35	8 (26.66)
36-40	13 (43.33)
Occupation	
Office workers	18 (60)
Others	12 (40)

Table 2 represents the mean comparison between two groups. A significant difference (*p<0.05)* was seen in pain, finger to floor test and ODI at the pre and post-test between the groups

Table 2. Comparison between treatment group and control group

Variables		McKenzie and GPR (Group-A)	McKenzie alone (Group-B)	P value
		Mean ± SD	Mean ± SD	
VAS				
	Pre	6.60 ± 1.121	5.80 ± 0.862	**0.023***
	Post	2.67 ± .900	2.73± 0.884	
Finger to floor test				
	Pre	16.20 ± 4.03	56.40 ± 13.81	**0.000***
	Post	3.73 ± 3.240	30.00 ± 9.943	
ODI				
	Pre	67.53 ± 9.665	16.53 ± 6.312	**0.000***
	Post	31.47 ± 6.069	10.73 ± 5.133	

*Significant at $p < 0.05$, VAS- Visual Analogue Scale, ODI- Oswestry Disability Index

The results of the current study reveals that there is a significant reduction in both the groups during pre and post three weeks' intervention. In the group comparison, significant differences were seen in the functional disability, flexibility and pain intensity. Thus, the current study supports the intervention of both McKenzie and global postural re-education as therapeutic approach among patients with non-specific back pain.

The McKenzie paradigm was founded on the premise that mechanical forces are not accepted properly by certain tissues, such as paraspinal musculature, spinal joint articulations, intervertebral discs, and neural tissue, leading to tissue damage and subsequent injury. If normal function is not restored, tissue healing will not occur and the problem will persist. Global Postural Reeducation' (GPR) is a physical therapy method based on an integrated concept of the muscular system as muscle chains that might shorten due to constitutional, behavioral, and psychological reasons (Bonetti et al., 2010).

The McKenzie technique resulted in significant improvements in functional impairment, flexibility, and pain intensity among participants in the current study. The current study findings are supported by prior systematic reviews that conclude McKenzie is beneficial in patients with non-specific low back pain (Namnaqani, Fayez Ibrahim, et al., 2019; Lam, Olivier T., et al., 2018). In response to a specific exercise, the directional preference in McKenzie technique demonstrated a rapid improvement in patient symptoms and could possibly escalated the improvements in patients (Lam, Olivier T., et al., 2018). However, past research has indicated that the McKenzie technique alone will not be sufficient in lowering pain and improving disability levels among patients (Fritz, J., 2010; Karayannis, N. V., et al., 2012).

In the current study, Group A (McKenzie and Global postural re-education) shows significant results. This is consistent with earlier research demonstrating a reduction in pain and an increase in the patients' flexibility (Cavalcanti, Isabela Franco, et al. 2020). One of the explanations for the analgesic action of global postural re-education is that muscle stretching decreases tissue viscoelasticity and increases range of motion or increase in blood flow produced by stretching in capillaries adjacent to the stretched region, hence decreasing pain (Shrier, I. and Gossal, K., 2000). Besides, stretching's effect on muscle spindles, Golgi tendon

organs, and joint receptors may promote functional improvement (Cornwell, A., Nelson, A.G. and Sidaway, B., 2002).

The current study is limited by its small sample size and lack of occupation classification for the participants. Recommendations for future research include increasing the sample size and conducting the intervention for a longer duration using randomized clinical trials approach.

Conclusion

In conclusion, the current study suggests that the combination of global postural education and McKenzie is more useful and efficient than McKenzie alone among patients with non-specific low back pain. Physiotherapist may use the McKenzie together with Global postural re-education in improving the quality of life among patients with non-specific back pain.

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