A Multicentral Quasi experimental Study on Impact of Neuromuscular Taping over Low Back Pain

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Abstract

Introduction: Low back pain in particular is considered to one of the major health problem in modern societies. It is also increasing in intensity, frequency, and severity because of more stress and strain on the back and. chronic lower back pain patient uses the health care system twice as often as the rest of the population. **Objective:** This study is done to check the effectiveness of Neuromuscular Taping over Low Back Pain in collaboration with Aimst University (Malaysia), NMT Institute Italy & USA, University of Indonesia, Mekelle University Ethiopia & Institute of Paramedical Sciences, Kannur, India. **Methodology:** A qualitative research model in the form of a prospective type quasi experimental study design is carried out in this study. The study is conducted in collaboration with AIMST University Malaysia, University of Indonesia, NMT Institute Italy & USA, Institute of Paramedical Sciences, Kannur, India and Mekelle University Ethiopia. Conveniently 800 Participants were selected in collaboration with AIMST University Malaysia, University of Indonesia, NMT Institute Italy & USA, Mekelle University Ethiopia & Institute of Paramedical Sciences, Kannur, India. **Result:** All selected Participants with Low back pain symptoms were assessed for low back pain index (LBPI) respectively before and after intervention with neuromuscular taping. The results from most of the participants showed significantly improvement after intervention. **Conclusion:** In this study pain factor is reducing, considering the fact NMT can be included as one among the modality used for the Treatment of Back Pain. Introduction of new intervention such as neuromuscular taping in terms of back pain Management itself is a very challenging. The investigation of such studies and their result will help for further research prospective.

Key Words: *Multicentral, Quasi experimental, Neuromuscular, Taping, Low Back Pain.*

Introduction

Musculoskeletal disorders became increasingly common worldwide during the past few decades [1]. It is common cause of work related disability, among workers with substantial financial consequences due to workers compensation (Ariens, et, al, 2011) [2]**.** Low back pain in particular is considered to one of the major health problem in modern societies. It is also increasing in intensity, frequency, and severity because of more stress and strain on the back and**.** Chronic lower back pain patient uses the health care system twice as often as the rest of the population (Bongers, et, al, 2016) [3]**.**Over a decade ago, the national Institute for Occupational Safety and Health, estimated that the cost associated with work related Musculoskeletal Disorder was $13 billion annually; more recently, this was projected to be between $45-54 billion. With children being exposed to computer – related activities at even earlier ages, the health of the future work force deserves contemplation (Bovimet, al, 2014) [4].The prospective studies on prevalence of low back pain are important to study the size and extent of this problem that would facilitate accurate prediction of the need for preventive measures.lower back -related disability, such as depression and anxiety or pain catastrophizing which may intervene in the relationship between structural pathology and disability (Chiu, et, al, 2012) [5]. Not the least of which is the patient's own perspective of their condition. Low back pain is costly in

terms of treatment, individual suffering and time lost due to work absenteeism. Many studies have been conducted to investigate the relationship between lower back and occupation (Coft, et, al, 2011) [6]. Factory workers as well as office workers have been mentioned as risky groups. Machine operating and carpentry compared to sedentary work were found to be risk indicators for lower back (Evans, et, al 2010)[7]. Found that lower back pain was a prevalent problem among managers and professionals also reported that university academic staff had higher prevalence of lower back pain and they were found to be a high-risk group of occupational related low back pain, Since posture and monotonous work have been pointed out as important factors in the development of occupational lower back disorders (Falla, et, al, 2011)[8]. Subjects with low back pain spent significantly more time in reading. Since higher educated population generally performs more reading tasks, higher education level may be one of the risk factors for low back pain [9]. The past two decades showed rapid developments in technology which resulted in the increased use and requirement of computers at the workplace (Fejer, et, al, 2014).Varying requirements and demands at each profession require these skilled staff to use computers more in order to be able to perform their tasks efficiently (Fine, 2009)[10]. immobilization and static work lead to reduced blood circulation, which prevents the proper supply of nutrients to the muscles, and an accumulation of waste products, causing fatigue and pain and that on a daily basis, persistence of these conditions could be resulting chronic musculoskeletal disorders work related lower back pain amongst university administrative staff[11] . lower back pain is one of the most common musculoskeletal complaints that affect about half of the adult population during a 1-year period (Grant,et,al., 2014).It is considered as a major public health problem, both in terms of health and overall well-being of the person and the society[12]. It has imposed relatively high direct and indirect costs, and may affect the quality of life and working condition of patients (Guez, et, al, 2012) [13]. Among occupational groups, office workers, especially intensive computer users, are at high risk. The ethology of work-related low back pain disorders seems to be multidimensional and is associated with physical and psychosocial factors (Grandjean, et al., 2012) [14]. A number of factors, including both individual factors (e.g. gender and age), and work related factors (e.g. repetitive work, prolonged sitting, and static posture), and also psychosocial factors, have been discussed as risk factors (Haartz, et al., 2015) [15]. They also correct the alignment of joints, support muscles during movement, and improve stability and posture[16]. The NMT concept has five major functions: Removes congestion of body fluids activates endogenous analgesic systems, corrects joint problems, muscle support, and scar treatments. Neuromuscular Taping often provides a solution in difficult situations, in acute stages, and in functional rehabilitation to reduce pain and inflammation [17]. Results can be seen in a wider range of motion, with less pain and discomfort, facilitating the rehabilitation of patients. Over the last 5 years in Europe proprioceptive NMT technique has become a mainstream treatment protocol in post-operative, oncology, neurological care of patients and in sports medicine [18]. It is estimated that 70% to 80% of the world's population has at least one episode of back pain in their life time [19]. This condition may cause a decrease in the quality of life of individuals, as well as deterioration in physical activity [20]. Generally incidents of back pain most commonly occur in between ages 25 and 50 years. Lack of knowledge about NMT directly affects access [21].

Methods and Subjects

A qualitative research model in the form of a prospective type quasi experimental study design is carried out in this study.

Standard Application procedure:

Patients diagnosed by Low back and neck pain for at least 6 months,

Features: Width Cm 5 and Length 30 cm.

Reference points: - Intergluteal line - Vertebral column.

Patient standing with hands resting on a table, anterior lumbar flexion of 45 °. Apply the base of the tape on the interglutea line and laterally 2 cm from the vertebral column. Remove the paper leaving only a small piece to hold the strip. Ask the patient to round the lumbar section (ask to "pull in the belly", the skin over the lumbar area must be stretched). The tape is applied with absolutely no tension. The tape is applied parallel to the column and must end at exactly the same level.

The treatment was given twice per week for 6 weeks (8-10 sittings). The cure tape is approved by the FDA and the product name is Tape and bandage, adhesive. Before the primary neuromuscular taping application VAS (visual analogue scale for pain scaling) and back pain index (Oswestry Low Back Pain Disability Questionnaire) were collected and this procedure was continuing till the end treatment sessions.

Work Plan & Contributions

No	Activities	Responsible Persons
1	Proposal development & draft submission	1Assoc.Prof.Dr.yu Chye Wah /2Kshtrashal Singh(AIMST University,Malaysia)
2	Ethical clearance	1Ms. Kavitha Shetty(AIMST University,Malaysia)
3	Select & training of data collectors	1Kshtrashal Singh (AIMST University,Malaysia)
4	Data collection	1Susmitha Govind/2Kasmalina 3Mr.Mahesh Hegde/4Ms.komala/5Ms.Shankari/6Ms. Malisha/7Mr. Nazri/8Mr.Goh/9Aditya Denny Pratama / 10Rahul Krishnan Kutty (MAHASA University , Malaysia)/ 11Saurabh Singh/ 12Khushboo Gupta/ 13Sivakumar Pendyala/ 14Kameswari Kondreddy/ 15Saurabh Shekhar.(1-8 & 11-15 AIMST University ,Malaysia)
5	Pilot Report	1Kshtrashal Singh(AIMST University,Malaysia) / 2Dr. Haftu Berhe Gebru (Mekelle University, Ethiopia) /3David Blow(NMT Italy & USA)/ 4Aditya Denny Pratama(University of Indonesia) / 5Rahul Krishnan Kutty(MAHASA University, Malaysia)
6	Data entry & analysis	Assoc.Prof.Dr.yu Chye Wah(AIMST University,Malaysia)
7	First draft	Kshtrashal Singh/(AIMST University,Malaysia) Assoc.Prof.Dr.yu Chye Wah(AIMST University,Malaysia)/ Dr. Haftu Berhe Gebru (Mekelle University, Ethiopia)/ David Blow(NMT Italy & USA)/ Aditya Denny Pratama(University of Malaysia) / Rahul Krishnan Kutty(MAHASA University Malaysia)/Heera S(Institute of Paramedical Sciences, Kerala, India)/Kamaraj B(AKG Institute, Kerala India)
8	Second draft	Kshtrashal Singh(AIMST University,Malaysia)/ Assoc.Prof.Dr.yu Chye Wah(AIMST University,Malaysia)/ Dr. Haftu Berhe Gebru (Mekelle University, Ethiopia)
9	Final report	Kshtrashal Singh(AIMST University,Malaysia)/ Assoc.Prof.Dr.yu Chye Wah(AIMST University,Malaysia)/ Dr. Haftu Berhe Gebru (Mekelle University, Malaysia)/ David Blow(NMT Italy & USA)/ Aditya Denny Pratama(University of Indonesia) / Rahul Krishnan Kutty(MAHASA University Malaysia)/Heera S(Institute of Paramedical Sciences, Kerala, India)//Kamaraj B. (AKG Institute, Kerala, India)

Results

A total of 800 academic and non-academic professionals are selected in collaboration with Institute of paramedical science, kannur, India Mekelle University, Ethiopia; University of Indonesia, Indonesia and AIMST University, Malaysia.

Table 1: Distribution of study samples by location

Centre/Country	Frequency	Percentage
India	200	25%
Ethiopia	200	25%
Indonesia	200	25%
Malaysia	200	25%

All selected participants with low back pain symptoms from respective centre were assessed for low back pain index (LBPI) respectively before and after intervention with neuromuscular taping. The results from most of the centres showed significantly improvement after intervention (Table 2). In India, there was a significant difference in reduction of low back pain reduction (t (199) =21.175), p<0.001). In Ethiopia, there was a significant difference in reduction of low back pain (t (199) =10.436, p<0.001). Similarly, a significantly reduction in low back pain (t (199) =37.546, p<0.01) were found in Indonesia. For Malaysia, however no significant difference was found in reduction of low back pain (t (199) =0.277, p=0.782) between pre and post intervention with neuromuscular taping (Table 2).

Table 2: low back pain index during pre and post intervention by centre/country

Centre	LBPI-Pre It(mean±SD)	LBPI-Post It(mean±SD)	t (df)	p[a]
India	2.99±1.43	1.88±1.291	21.175(199)	0.000
Ethiopia	2.73±1.39	2.35±1.40	10.436(199)	0.000
Indonesia	3.85±1.30	2.03±1.17	37.546(199)	0.000
Malaysia	1.99±1.27	1.98±1.32	0.277 (199)	0.782

Note: NPI: Neck pain index; LBPI: Low back pain index; It: Intervention; SD: Standard deviation, df: Degree of freedom; [a] Paired t-test

The results from comparison of overall low back pain index between pre and post intervention also depicts significant effect (Z=-21.501, p<0.001) (Table 3).

Table 3: Effect of overall low back pain index after intervention

	Mean	SEM	Z	pa
Overall low back pain index Pre-intervention Post-intervention	 3.1844 2.1511	 0.5304 0.4378	-21.501	0.000

Note: SEM: Standard error of mean, a: Wilcoxon signed rank test

The results comparing the mean in reduction of low back pain depicted significant difference among the centres (Table 4).

Table 4: improvement of low back pain index among university groups

Outcome Difference	Centre-Country	Mean	SE	95% CI		$\chi 2$	pa
				Lower	Upper		
Low back pain index	India Ethiopia Indonesia Malaysia	1.660 1.353 1.232 -0.112	0.030 0.030 0.003 0.030	1.600 1.293 1.172 -0.171	1.720 1.413 1.292 -0.052	498.02	0.000

Note: SE: Standard errors; CI: Confidence interval; a: Kruskal-Wallis test

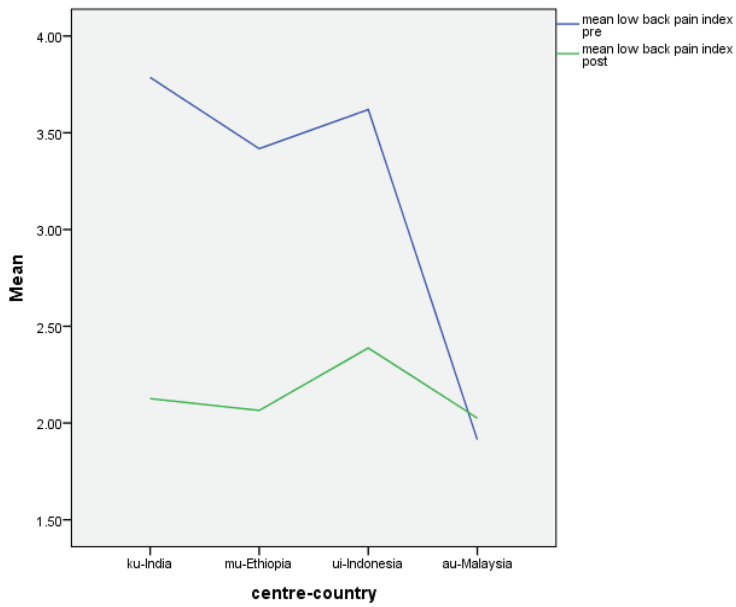

Figure 1: Low back pain index PR

The magnitude of reduction of low back pain index was depicted in Figure 1. The participants from Indonesia recorded the highest reduction of low back pain index which achieved 47.3% from 3.85 to 2.03. The second highest reduction in low back pain index was participants from India which reported 37.1% from 2.99 to 1.88. The third highest reduction in low back pain index was participants from Ethiopia which achieved 13.9% from 2.73 to 2.35. The least reduction in low back pain index was participants from Malaysia which merely achieved 0.5% from 1.99 to 1.98

Discussion

As back pain can cause temporary physical disabilities to understand the pattern of disabilities post back pain, Oswestry Low Back Pain Disability index (ODI) was included in this study. ODI values were expressed in Mean ±SD. The result shows a marked variation between the pretest ODI value and posttest ODI value. Here by based on the result it can be concluded that neuromuscular tapping is more effective in reduction of back pain and can be considered as a treatment protocol for back pain. In contrast with NMT application was also shown to be effective so based on these facts that NMT has some superficial placebo effect on pain reduction in case of back pain. This data report could be considered an observational pilot study with the prospect to inform clinical practice.

Conclusion

In this study pain factor is reducing, considering the fact NMT can be included as one among the modality used for the treatment of Back Pain. Introduction of new intervention such as neuromuscular taping in terms of back pain management itself is a very challenging. The investigation of such studies and their result will help for further research prospective.

Ethical Clearance: No ethical approval is needed.

Source of Funding: Self

Conflict of Interest: Nil

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