# A Cross- Sectional Observational Study On The Prevalence Of Mechanical Low Back Pain In Physiotherapy Students

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**Abstract:** Background & Objectives: Ergonomics is an integral part of rehabilitation. However, few therapists implement it themselves, hence suffering from various musculoskeletal disorders – the most common being low back pain. Taking a community of physiotherapy students, the prevalence of mechanical low back pain was investigated to illuminate the possible risk factors faced by the students in question. The aim of the study was to investigate the prevalence of mechanical low back pain and disability in physiotherapy students. Methods: The study was conducted in the physiotherapy department of a tertiary health care centre in Mumbai. A self-constructed, semi-structured proformawas handed over to the students, who were made to fill out the "Modified Oswestry Low Back Pain and Disability Questionnaire". Pain Intensity was recorded on the Visual Analogue Scale. The data was compared and analysed. Results: 352 per1000 students suffered from mechanical low back pain. Majority suffered from mild disability. Standing was the most affected activity. Interpretation & Conclusion: Physiotherapy students should bemade aware of the potential causes of mechanical low back pain, which could stem from the practice of this occupation. Primary prevention will lead to a better state of health for the students and future therapists, enhancing patient rehabilitation. [Patil V NJIRM 2016; 7(6):9-12]

**Key Words**: low back pain, mechanical, physiotherapy

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**Introduction:** Physiotherapy is a physically demanding profession. The education of a physiotherapy student incorporates vast theoretical knowledge i.e. it includes attending lectures as well as clinical training to gain hands on experience. This puts novice students at a risk of developing musculoskeletal disorders, sometimes resulting in injuries.

Mechanical low back pain (MLBP) may be caused by injuries to the muscle (strain) or ligaments (sprains). Risk factors for MLBP include: heavy lifting, bending, twisting, sustained awkward postures, restricted work space, pressure on joints during mobilizations, etc.

Though being largely devoted to the practice of ergonomics, most students rarely implement it in their daily practice. The academic and administrative faculty at universities may be blindsided to these risk factors. This calls for an urgent need for investigation into the repercussions of this failure. Hence, it was sought to investigate the prevalence of mechanical LBP in physiotherapy students and observe the distribution of severity and the academic year wise distribution using the visual analogue scale (VAS) and the Modified Oswestry Low Back Pain and Disability Questionnaire.

**Methods:**This study was a cross-sectional observational study. It was conducted in the physiotherapy department of a major tertiary health care centre in Mumbai. This study was initiated after approval from a departmental ethics committee.

The entire student population, including Undergraduate (BPTh), Intern, and Post Graduate (MPTh) students, was approached. All the students were willing to take part in the study. Written consent was then taken from every student. Each batch had a maximum intake of 10 students in BPTh and 6 students in MPTh. The total sample size was 65 (Table 1). Out of the 65 students surveyed, 8 were males and 57 were females. Each student was given a self-constructed semi-structured proforma, which required the student to provide demographic data (name, age, gender, address) along with their pain history (duration, type, aggravating and relieving factors, and diurnal variations).

**Table 1: Year Wise distribution of the sample size**

| Batch | Students |
|---|---|
| I BPTh | 10 |
| II BPTh | 8 |
| III BPTh | 9 |
| IV BPTh | 9 |
| Interns | 11 |
| I MPTh | 6 |
| II MPTh | 6 |
| III MPTh | 6 |
| Total | 65 |

When used, the proforma helped differentiate mechanical low back pain from low back pain of other known origins. The students were asked to provide additional information pertaining to their daily activities in the institution (e.g. Number of clinical hours, break schedule, etc.).

On the basis of the proforma, the prevalence of students suffering from mechanical low back pain was established. Unilateral pain without referral to the knee caused by injuries to either the muscle (strain) or ligaments (sprains) or facet joints, and in some cases the sacroiliac joints was considered mechanical low back pain.

Those who gave a pain history suggesting back pain from causes other than mechanical (for example, symptoms such as morning stiffness or recent trauma to the back, or pain that is better on activity than at rest) were excluded from the count of students suffering from mechanical low back pain(1).

The outcome measures used for this study were the Visual Analogue Scale and the Modified Oswestry Scale of Low Back Pain and Disability Questionnaire.

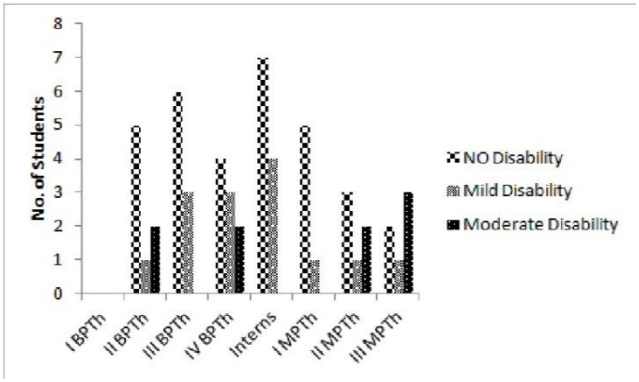
To measure the intensity of mechanical low back pain, the Visual Analogue Scale was used. It is a validated scale for acute or chronic musculoskeletal pain(2)(3). Data was recorded twice, once each at the beginning andend of the work day. If the pain was mechanical in nature, it would decrease on rest and increase with activity.

To record the severity of disability in those suffering from mechanical low back pain, the Modified Oswestry Scale of Low Back Pain and Disability Questionnaire was used. This scale is a self-administered, likert scale. It is easy to administer and score. There are 10 questions with 5 possible choices. Each item is scored from 0 to 5, with higher values representing greater disability. The maximum score that can be obtained is 50, with the obtained score being doubled to get a percentage score(4)(5). The scale also has a specific grading of mild, moderate, severe, crippled and bed bound, based on the score obtained.

**Result:** In accordance with the objectives of the study,the results showed that 354 per 1000 students suffered from mechanical low back pain.The collated data showed the number of students with Mild disability to be greater than the number of students with Moderate disability; and also that none of the students suffered from severe or very severe disabilities. The number of students suffering from Mild disability was found to be maximum among interns. The number of students suffering from Moderate disability is maximum in the IIIMPTh batch (Graph 1).The most affected component of the Modified Oswestry Low Back Pain and Disability Questionnaire was standing.

Using the Pearson correlation coefficient, it was found that, there was a negative correlation between low back pain and the duration of lecture hours{Pearson correlation coefficient (r) = - 0.18} ; while there was a positive correlation between low back pain and the duration of clinical hours {Pearson correlation coefficient (r) = + 0.18}.

**Graph 1: Academic Year Wise Distribution of Disability**




**Discussion:** The results showed that 354 per 1000 physiotherapy students suffer from mechanical low back pain (Table 2). This could be attributed to faulty postures, prolonged sitting, prolonged standing, and flawed techniques adopted during the course of their education. Cromie et al found that “working in awkward positions was associated with increased risk of low back symptoms” whilst “working in the same position for long periods was associated with increased risk of upper back symptoms.” Prevalence of back pain among physiotherapists in Cromie’s study was 62.5% in the low back and 41% in the upper back(6).

**Table 2: Prevalence of Mechanical Low Back Pain**

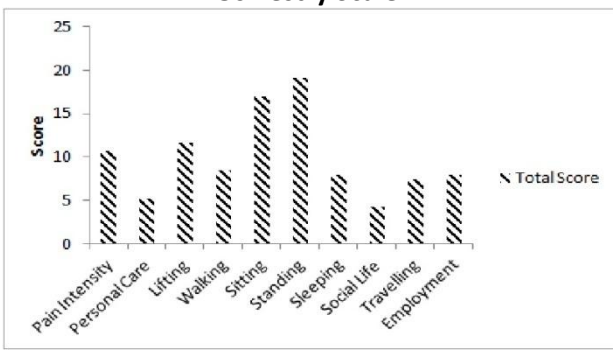
| Samples having Back Pain | Samples not having Back Pain | Total |
|---|---|---|
| 23 | 42 | 65 |

Students, in the field of physiotherapy are exposed to a clinical setting right from day one of their under graduation. In 1990, the psychologist George Miller proposed a framework for assessing clinical competence. At the lowest level of the pyramid is knowledge (knows), followed by competence (knows how), performance (shows how), and action (does), (work based assessment)(7). As a student moves up a year, he/she automatically moves up a rung in Miller's pyramid i.e. his/her clinical competency improves with every year. Taking this into consideration, the number of clinical hours assigned to the students increases.

The I BPTh batch was devoid of any students suffering from mechanical low back pain (Graph 1). This could be credited to the fact that, as this is their first year, their main duty in the clinics is to observe rather than actually treat the patients. Their hands on is the least compared to the other batches. As the academic year starts late for the first year students, majority of their time is spent attending lectures to try and complete the syllabus.

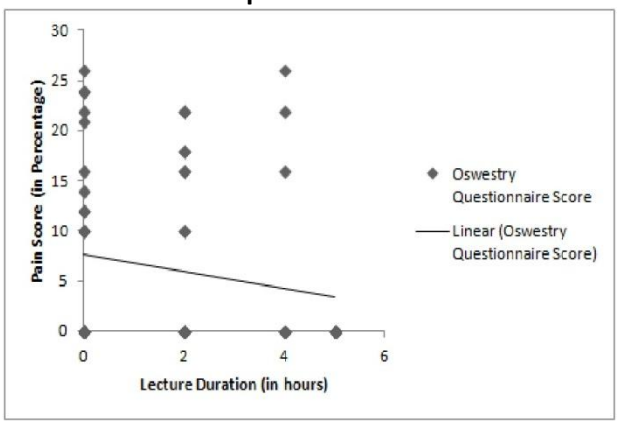
The batch with maximum number of students suffering from mild disability was the Intern batch (Graph 1). The Intern batch had increased clinical hours which could be recognised as the cause of the mechanical back pain. Having finished their under graduation just a few months back, their techniques are not completely refined, possibly leading to the above results. The batch with the maximum number of students suffering from moderate disability was the III MPTh batch (Graph 2). The III MPTh students have greater knowledge and superior treatment techniques. This leads to an increase in their responsibilities. They handle a loftier patient load. In addition to their clinical responsibilities, they also have to teach and supervise the under graduate students.

**Graph 2: Affected Components of the Modified Oswestry Scale**




Individuals affected during standing activity were maximum , followed by those affected during sitting activity (Graph2). During clinical hours, the students are constantly on the move. Due to a high patient load, there are no likelihoods for breaks or rest pauses. Furthermore, due to fixed instrumentation such as non-adjustable plinths, there could be adaptation of faulty postures while performing techniques. Prolonged periods of standing have been linked with the onset of low back pain symptoms in working populations(8). Gregory and Callaghan reported that around 50% of healthy subjects perceived low back discomfort after 2 hours of standing(9). The students belonging to the BPTh section have to attend lectures for an average of 2 to 3 hours a day in addition to their clinical duties. Sitting (especially prolonged sitting) is generally accepted as a risk factor in developing low back pain(10).

**Graph 3: Correlation between lecture duration and pain score**

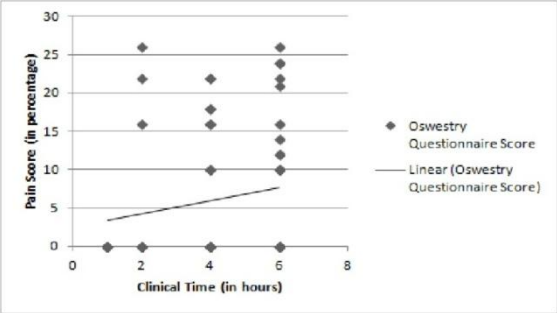



To understand the correlation between lecture duration and its influence over back pain the Pearson's correlation test was applied. There was a negative correlation between low back pain and duration of lecture hours (Graph 3). This means there is inverse relationship between duration of lecture hours and back pain. Amidst a demanding and hectic clinical posting, lecture hours could possibly act as a rest break from the prolonged standing posture. Sitting down for lectures could mitigate the stress placed on the antigravity muscles of the back and lead to a decrease in the prevalence of MLBP.

To understand the correlation between clinical work duration and its influence over low back pain, the Pearson's correlation test was applied. The result indicates that there is a positive correlation between low back pain and the duration of lecture hours

(Graph 4).This implies that the clinical work duration and low back pain are directly proportional to each other. According to research cited by Whistance, Adams, van Geems & Bridger, individuals required to stand for prolonged periods adopt asymmetrical standing attitudes four times more often than symmetrical attitudes(11).Increased hip and trunk muscle co-activation is considered to be predisposing for Low back pain development during standing in previously asymptomatic individuals(12).

**Graph 4: Correlation between Clinical Hours and Pain Score**




**Conclusion:** At the level of primary prevention, the students need to be informed of the possible risk and aggravating factors associated with low back pain. They should be encouraged to report when injured. Appropriate warm up can be done, before commencing the work day. A strict work to rest ratio should be maintained. Assistance should be requested when dealing with heavy patients and when lifting and transferring is required. Back and core muscle strengthening can be done daily in groups. Appropriate use of the surroundings should be made (eg. Using a stool, adjusting the plinth height).At the level of secondary prevention, the student needs to be properly assessed and treated. Students need to take a proactive role in the maintenance of their personal health and safety. Only in an optimal state of health can they help their patients proficiently.

**Acknowledgment:** We the co- investigators would like to thank the Dean of our esteemed institution, for his invaluable encouragement and guidance. We would also like to thank Dr. Prashant Tamboli for lending us his expert advice in the field of biostatistics.

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Conflict of interest: None

Funding: None

Cite this Article as: Vishakha P,Mahaziver F Rajashree N .Study On The Prevalence Of Mechanical Low Back Pain In Physiotherapy Students. Natl J Integr Res Med 2016; 7(6): Page no 9-12