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## Prevalence of low back pain among physiotherapy interns and post graduate students in Bangalore

**Shishira KB and Pavana**

### Abstract

Low back pain (LBP) is a social, economic and most common orthopaedic health problem that affects population of all ages. Over the years the prevalence of the condition has been reported among different population with particular interest in various occupational groups. It is however interesting to know that health care professionals is not exempted from the scourge of low back pain. Consequently several studies have focused on the prevalence of low back pain among various health care professionals including physiotherapists. It is important to note that exposures to many of the physiotherapy work activities commences from the period of undergraduate physiotherapy training, thus making low back pain a likely occurrence among physiotherapy students. This study therefore focuses on the prevalence of low back pain. The investigator had personally contacted HOD of respective physiotherapy colleges and obtained permission from the concerned authorities and with the subjects to conduct the study. Subsequently after obtaining the permission the investigator had screened the subjects as per inclusion and exclusion criteria, Nordic musculoskeletal questionnaire was distributed among the students and were retrieved after filling. Prevalence of LBP was examined with descriptive statistics. More female students (75%) of 1st year Post Graduate students with moderate level of fitness participated in the study. Life time prevalence, 1 month prevalence and 7 days prevalence was 66%, 42.9% and 31.3%. Hence there was a significant prevalence of low back pain; identification of factors responsible and preventive measures needs to be addressed.

**Keywords:** Prevalence of low back pain, physiotherapy students, work related musculoskeletal disorders

### Introduction

Low back pain (LBP) is a social, economic and most common orthopaedic health problem that affects population of all ages. It is one of the most common problems in adolescents and known to affect both older and younger adults <sup>[1-3]</sup>. Low back pain is the leading cause of disability and inability to work and expected to affect up to 90% of people at some point in their lifetime <sup>[4]</sup>. Many studies have attempted to identify and evaluate the contribution of different demographic, physical, socioeconomic, psychological and occupational factors to the development of spinal pain. It is interesting that 37% of low back pain worldwide is attributable to occupational risk factors <sup>[5]</sup>. The lumbar spine is the area of the spinal column that comprises the low back. The lumbar vertebrae consist of five vertebrae that make up the spine in the lower back. L1, the most upper vertebrae meets the bottom of the thoracic vertebrae T12 while the base of the lumbar vertebrae L5, meets the sacral spine. The lumbar vertebrae are the largest of the major weight-bearing and highly mobile vertebrae in the body. There are many classifications of LBP. LBP is usually classified into three different types acute, sub-acute and chronic according to the length of time the pain persists on a subject. Acute back pain is the most common presentation and is usually self-limiting; lasting less than 6 weeks regardless of treatment. Sub-acute LBP lasts between 6 and 12 weeks while chronic back pain is a more difficult problem and often persists for more than 12 weeks. LBP is also categorised into mechanical LBP and secondary LBP by different aetiologies. For mechanical or nonspecific LBP, it has no specific underlying pathology or nerve root compromise. It is the tension, soreness or stiffness in the lower back region for which the specific cause of pain is still unknown. There are many factors that can lead to back pain. Such risk factors that directly cause LBP compromise prolonged sitting, poor posture, bending or twisting awkwardly, incorrect lifting technique and so forth.

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Other underlying factors including the physical inactivity, sedentary lifestyle and psychological stress are also causing the pain. Sitting; especially prolonged sitting generally accepted as a risk factor in developing low back pain. In general, most of the students often do the activities that require long periods off sitting as majority of their jobs is performed while sitting. For eg: they may sit in the chair for hours in class or in front of the computer and this prolonged sitting was a major cause of low back problem among the university students. This is because the long periods of sitting and lack of spinal motion may increase the stress on the back, neck and legs and puts an extra pressure to the back muscles and the supporting tissues leading to muscle tension and fatigue, joint strain and disc compression. The improper ways of sitting such as leaning forward can over stretch the ligaments and strain the supporting tissues of back. Other than that, awkward body postures such as twisting the trunk to reach for an object, wrong lifting technique like bending or twisting the trunk while lifting a heavy object adds an extra workload to the back and cause undesirable stress to the spine. Stress and other emotional factors are believed to play a major role in low back pain, particularly chronic low back pain. Most students are under stress. They are unable to manage it effectively and this always associated with anxiety or depression. In turn, this psychological stressful mind indirectly leads to low back pain, this is been explained by a theory of stress related back pain called "Tension myositis syndrome" (TMS). The emotional tension causes vasoconstriction; reduce the blood flow to various soft tissues, including muscles, tendons, ligaments and nerves in the back. This will further decrease the oxygen supply to all the tissues and build up waste products in the muscles. As a result muscle tension, spasm and back pain will be experienced by the subject [6]. Over the years, the prevalence of the condition has been reported among different population with particular interest in various occupational groups. From as early as the 17th century to date, low back pain resulting from occupational and work related activities has generated lots of attention in health care literature [7, 8]. It is however interesting to know that health care professionals are not exempted from the scourge of low back pain consequently, several studies have focused on the prevalence of low back pain among various health care professionals including physiotherapists [9-12]. Physiotherapists are professionals trained to; among other healthcare services, provide rehabilitative care in a wide range of disabling conditions with the aim of restoring, maintaining and promoting functions [13]. Although physical therapy aims to promote an individual's health, majority of the instruments used and the work environment when the practice is carried out do not respect many ergonomic precepts. [14] Interventional skills by physiotherapist often entail a considerable amount of "hands-on" techniques that are characterised but repetitive movements, prolong standing, and somewhat difficult postures [9, 15]. Transferring and lifting patients are also common work activities in physiotherapy, such activities are considered to be the risk factors for low back pain and have been linked to its onset [9]. Physical therapists are among health professionals who show more postural disturbances since their occupation demands great efforts of musculoskeletal system, maintenance of static and dynamic postures for longer period of time and especially movements which overload the spine [16]. It is important that exposures to many of these physiotherapy work activities commences from the period of undergraduate physiotherapy training, thus making low back pain a likely occurrence

among physiotherapy students. The potentially deleterious postures physiotherapy students assume during other training related activities such as prolonged sitting during lectures or personal study and practical classes involving practice of tests and therapeutic techniques may also increase the risk of low back pain [17]. Physiotherapy students are potentially exposed to the same low back pain occupational risks as professionals such as poor working posture of frequent manual handling activities, often undertaken in difficult environments and with variable training regarding personal safety [18, 19]

Identification and better understanding of the prevalence and risk factors of low back pain are the essential steps to plan and implement prevention program for decreasing the prevalence of low back pain among physiotherapy students. The objective of the study was to measure the prevalence of low back pain among physiotherapy interns and post graduate students in Bangalore.

### Materials and Methods

Subjects from physiotherapy colleges across Bangalore took part in the study. Sample consisted of 153 samples based on the prevalence rate of 69% from previous literature findings, with design effect of 2.0, 15% of margin error and 95% confidence interval using Systematic random sampling technique.

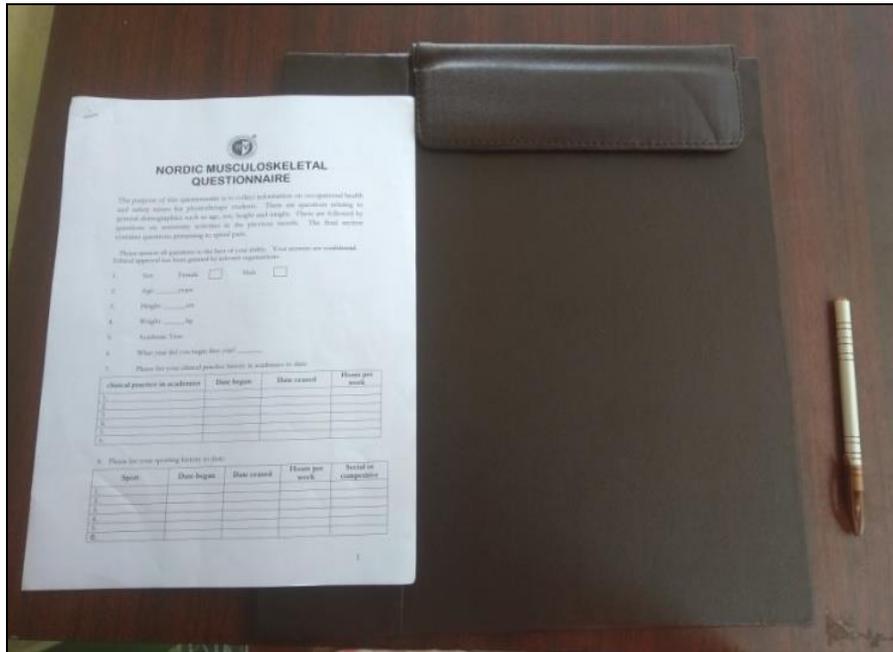
**Inclusion Criteria:** Physiotherapy post graduate student or intern, Students having clinical exposure (outpatient and inpatient clinical postings), willing to participate in the study.

**Exclusion Criteria:** Low back pain due to trauma, Low back pain due to neurological disorders, Spinal degenerative conditions, Previous spinal surgeries, Gynaecological disorders like PCOS and PCOD, Other systemic disorders.

**Materials Required:** Pen, Writing pad, Nordic musculoskeletal questionnaire. **PROCEDURE:** A cross sectional study was conducted after obtaining an ethical clearance from the college authorities by using previously validated standardised Nordic musculoskeletal questionnaire to know the prevalence of low back pain among interns and Post graduate physiotherapy students in Bangalore through Google doc system/email services and self-approach. Questionnaire was taken from the study carried out by Nyland and Grimmer. Questionnaire sought standard information on gender, age, height, weight amount and type of occupational and sporting activities and current level of fitness were self-assessed as poor, moderate and good. It also included purpose built questions on exposure to perceived workplace hazards for physiotherapy students. The time frame of the past month for educational exposure was determined. Low back prevalence questions that captured information on life time, 12 month, 1 month and 1 week prevalence. Study consisted of 153 students from the physiotherapy colleges in Bangalore. The investigator had personally visited all the physiotherapy colleges in Bangalore and contacted the HOD of respective physiotherapy colleges and obtained permission from the concerned authorities to conduct the study. Subsequently after obtaining the permission the investigator explained the details and purpose of the study to the students and took their permission for continuing the study. Investigator screened the subjects in their college premises during their free hours as per the inclusion and exclusion criteria if they expressed the willingness to participate in the study. Informed consent was then taken and questionnaires were distributed among the

included students and were retrieved. For those students who couldn't fill the form during researcher's visit were asked to fill the form online and submit it. Researcher contacted them through email and data was retrieved by them online by mailing the questionnaire through Google forms.

**Statistical Analysis:** Descriptive statistics of mean, standard deviation, frequencies, and percentages were utilized in presenting the student's demographic and LBP data using SPSS software version 16 and MS Excel 2007.



**Fig 1:** Materials required during the study



**Fig 2**



**Fig 3**

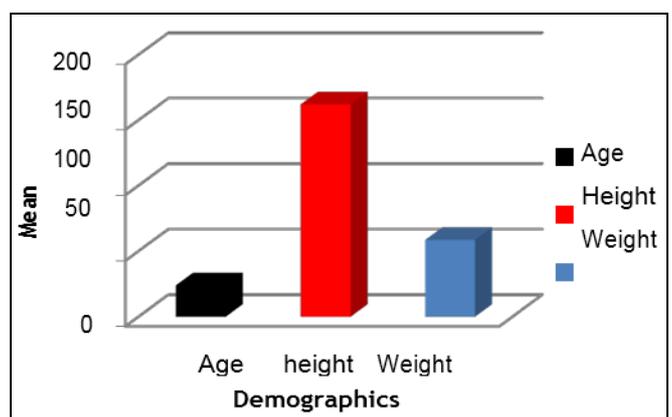
**Fig 2 and Fig 3:** data collection during the study

Results: 152 out of 191 physiotherapy interns and post graduate students responded to the study with the response rate of 79.58% of which 5 students got excluded. 147 eligible students participated in the study with the mean age of  $23.97 \pm 2.36$  yrs, weight  $58.55 \pm 9.5$  kgs, and height  $162.03 \pm 7.25$  cms. Most of the students were female (75%) and were 1st Yr Post Graduates (42.6%) with level of fitness being moderate (70.9%).

Table 1: Shows demographic character %istics, Table-2: gender and Table-3: academic year; Table-4: level of fitness

**Table 1:** Demographic characteristics

	Age	Height	Weight
Mean	23.97	162.0370	58.551
Standard deviation	2.362	7.25462	9.5006

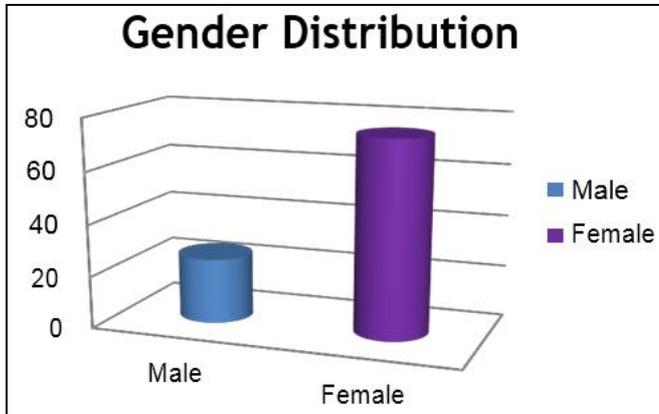


**Fig 4:** Demographic characteristics

Both table 1 and fig 4 representing the mean age of population being  $23.97 \pm 2.36$  yrs, with mean height  $162.03 \pm 7.25$  and mean weight of  $58.55 \pm 9.5$  kgs.

**Table 2: Gender**

	Frequency	Percent
Male	37	25.0
Female	110	74.3
Total	147	99.3

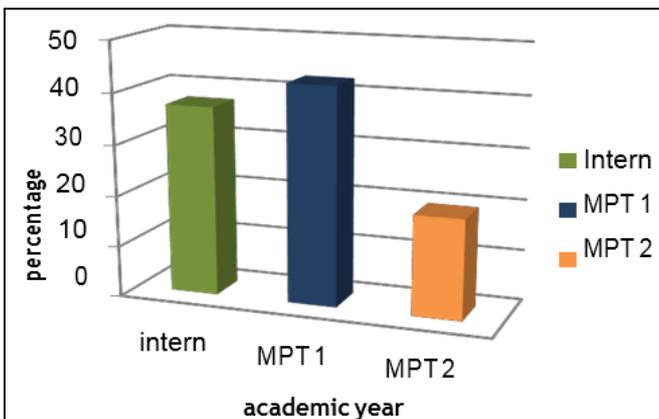


**Fig 5: Gender distribution**

Both table 2 and fig 5 representing the percentage of female population (75%) being more than male population (25%) from the population.

**Table 3: Academic year**

	Frequency	Percent
Intern	55	37.2
MPT 1st year	63	42.6
MPT 2nd year	29	19.6
Total	147	99.3

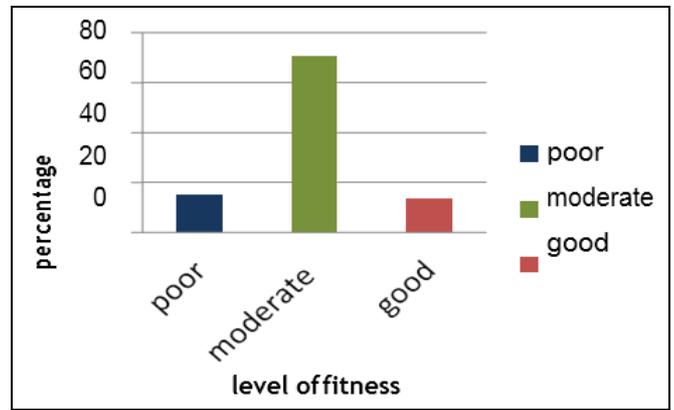


**Fig 6: Academic year**

Both table 3 and fig 6 graph representing the majority of the population being 1st year MPT students with 42.6% compared to interns 37.2% and 2nd year MPT students 19.6%.

**Table 4: Level of fitness**

	Frequency	Percent
Poor	22	14.9
Moderate	105	70.9
Good	20	13.5
Total	147	99.3



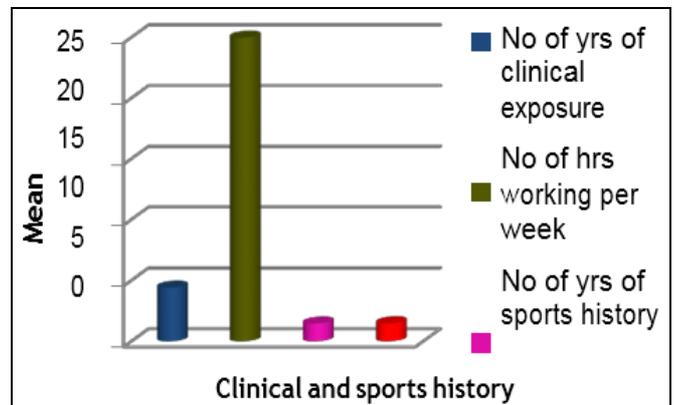
**Fig 7: Level of fitness**

Both table 4 and fig 7 representing the majority of moderate level of fitness of population (70.9%) where poor was (14.9%) and good being (13.5%)

Students who responded to the questionnaire had mean clinical exposure of  $4.40 \pm 1.34$  yrs and mean duration of work per week of  $24.98 \pm 6.79$  hrs, mean years of sports history was  $1.46 \pm 3.59$  yrs and mean duration of sports per week was  $1.48 \pm 3.66$  hrs. (Table 5 and fig 8 shows history of clinical exposure and sports,).

**Table 5: History of clinical exposure and sports**

	Mean	Std. Deviation
No of yrs of clinical exposure	4.408	1.3435
Duration of work per week	24.9750	6.79293
No of yrs of sports history	1.469	3.5941
Duration of sports per week	1.4797	3.66161



**Fig 8: History of clinical exposure and sports**

Both table 5 and fig 8 representing mean values of clinical exposure  $4.40 \pm 1.34$  yrs and sports history  $1.46 \pm 3.59$  hrs.

Students had university activities for the past month with the mean values for hours of sitting looking straight being  $2.04 \pm 1.44$  (11-20hrs), sitting looking down  $2.07 \pm 1.55$  (11-20hrs), practising techniques on others  $1.65 \pm 1.06$  (1-10hrs), techniques being practised on self  $0.07 \pm 0.87$  (0hrs), and treating patients  $3.44 \pm 2.41$  (21-30). (Table 6 and fig 9 shows university activities).

**Table 6: University activities**

	Mean	Standard deviation
Sitting looking straight in hrs	2.041	1.4424
Sitting looking down in hrs	2.075	1.5531
Technique on someone in hrs	1.646	1.0650
Technique on you in hrs	.966	.8713
Treating patients in hrs	3.442	2.4075

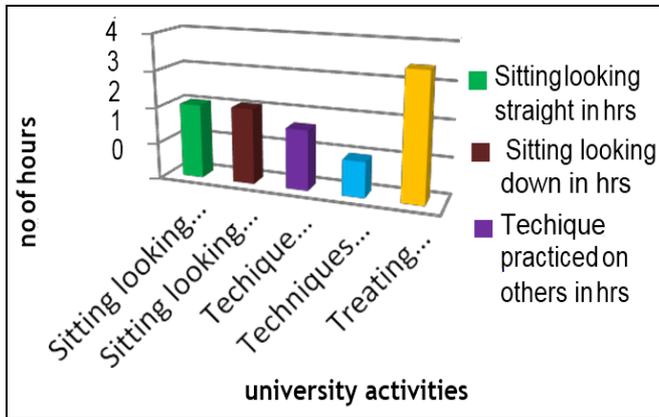


Fig 9: University activities

Both table 6 and fig 9 representing the mean values of university activities of the population where sitting looking straight was 2.04±1.44 (11-20hrs), sitting looking down 2.07±1.55 (11-20hrs), practising techniques on others 1.65±1.06 (1-10hrs), techniques being practised on self 0.07±0.87 (0 hrs), and treating patients 3.44±2.41 (21-30).

Among those students who responded to questionnaires who had clinical exposure and sports history there were 66% of students who were suffering from LBP with the mean age of initial onset being 20.7±2.92yrs. (Table 7 and fig 10 shows percentage of students suffering from LBA, table 8 shows age of initial onset)

Table 7: students suffering from LBA

LBA	Frequency	Percent
No	50	34.0
Yes	97	66.0

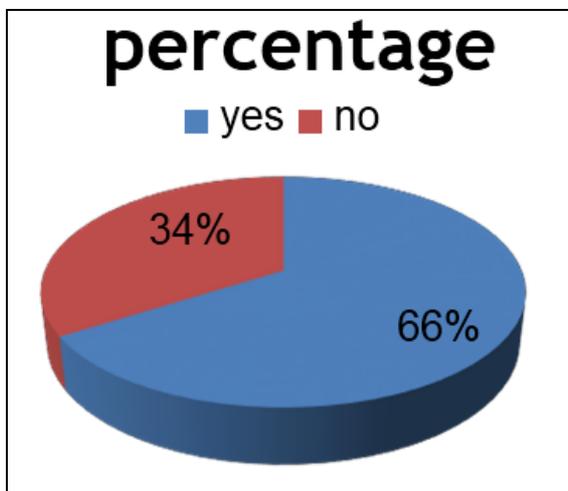


Fig 10: students suffering from LBA

Both table 7 and fig 10 representing the percentage of population having low back pain being 66%.

Table 8: Age of initial onset

Initial onset age	Mean	Std. Deviation
Initial onset age	20.70	2.920

Out of 66% of students who had LBA for the past year 32% of them had pain lasting for 1-7days, 11.6% had for 8-30days, 18.4% had for >30days and 4.1% of them had every day. (Table 9 and fig 11 shows duration of LBA lasting for the past year)

Table 9: duration of LBA for the past year

	Frequency	Percentage
1-7 Days	47	32.0
8-30 Days	17	11.6
>30 Days	27	18.4
Everyday	6	4.1

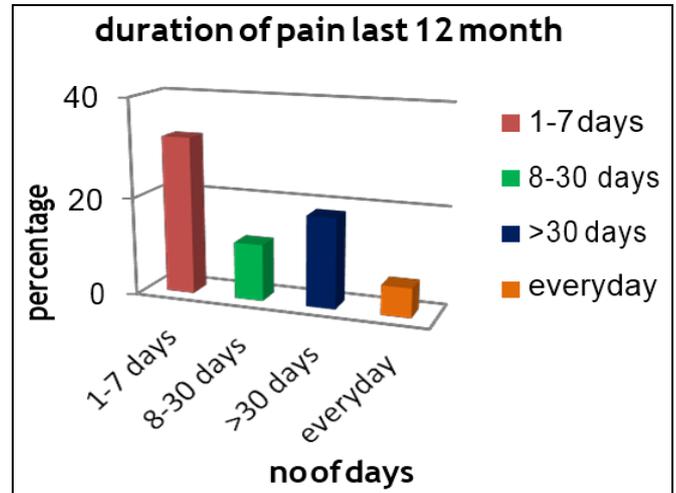


Fig 11: duration of LBA for the past year

Both table 9 and fig 11 representing the duration of low back pain for the past year where 32% of the students having low back pain for 1-7 days, 11.6% of them had low back pain for 8-30 days, 18.4% of them had low back pain for >30days and 4.1% of the students had low back pain every day.

42.9% of the population had LBP for the past month and 31.3% of the population had LBP for the past 7 days signifying

Table 10: LBA for past month and past week

	Frequency	Percentage
LBA last month	63	42.9
LBA last 7 days	46	31.3

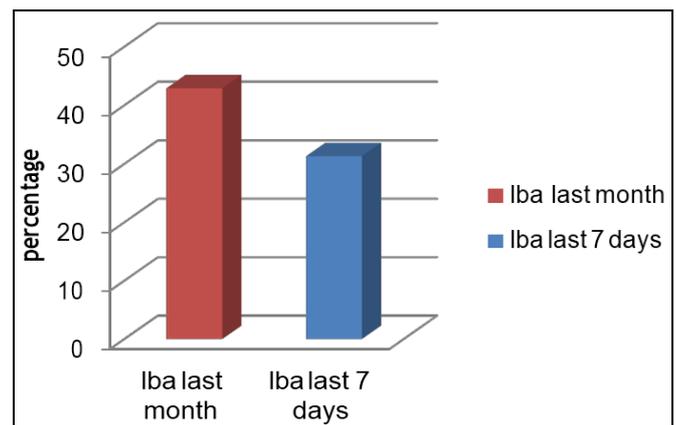


Fig 12: LBA for past month and past week

Both table 10 and fig 12 representing 1 month prevalence (42.9%) and 7 days prevalence (31.3%) of low back pain.

**Discussion**

The aim of this study was to measure the prevalence of low back pain among physiotherapy interns and post graduate students across Bangalore. The percentage response for this study was 79.58% which is consistent with response of similar studies from Nigeria [20] (71%), Peshawar [21] (71.81%)

and higher from study in Utar <sup>[6]</sup> (99.7%). Out of 152 respondents 147 were considered valid and remaining five didn't fulfil the eligibility criteria. Among these 147 students female population were more than male population where most of them being 1st year Post Graduates with moderate level of fitness.

We found out that life time prevalence of low back pain among interns and post graduates was high where 97 participants out of 147 were having low back pain. Several studies which were conducted by other researcher previously supported that there is high prevalence of low back pain among physiotherapists <sup>[22-24]</sup>. Most of the students from our sample reported that initial age of onset for low back pain being <sup>[20-22]</sup>. It was also noted in the study that 1 month prevalence of low back pain was higher than 7 days prevalence low back pain among students. Identification of factors that significantly impact on the onset, prevalence and providing preventive strategies are necessary.

### Limitation of the study

Study was limited by the fact of daily activities of the subjects which was not monitored or documented which could have influenced. Study was generalized on the population where area of specialization could have influenced. Duration of study is based on the prevalence and with the occupational relevance and musculoskeletal disorders was collected but study to improve ergonomics and postural corrections can be an intervention. Association between LBP prevalence and student's demographic characteristics and time spent engaging in educational activities not measured.

### Scope for further study

Study with longer duration are recommended with larger follow up period to assess long term benefits of ergonomics advice to improve the better professional skills without any musculoskeletal disorders.

### Conclusion

There was significant prevalence of LBP among physiotherapy interns and post graduates in our study. The study also signified that 1 month prevalence of LBP was higher than 7 days prevalence among the students. Hence identification of factors responsible for LBP and preventive measures needs to be addressed in their education and training.

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