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Rehabilitation Communications

DOI: 10.55627/rehab.001.01.0192

Research Article

Lower Back Pain and Disability in Undergraduate Medical Students

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Abstract

Low back pain (LBP) related disability is a big concern among the general population, especially undergraduate medical students. This study aimedto evaluate LBP-related disability in undergraduate medical students. It was a cross-sectional survey conducted within the premises of Islamabad and Rawalpindi. The data was collected using an online Oswestry LBP disability questionnaire. A sample of 300 students took part from the following colleges; Riphah University Islamabad and Margalla Institute of Health and Sciences Rawalpindi, Pakistan. There were 150 medicine students (MBBS) and 150 dental students (BDS). The disability index was calculated, and results showed that 205 students had a minimum disability, 79 had a moderate disability, 16 had a severe disability,and no participants fell into the crippled or bed-bound disability category. The results of the study demonstrate that the prevalence of mild LBP-related disability is high in undergraduate students of MBBS and BDS, which might affect the activities of daily life.

Keywords: Low back pain, disability, Oswestry low back pain questionnaire, BDS, MBBS, disability index.

1. Introduction

Low back pain (LBP) is common in most individuals at one point or another in their lifetime (Balagué et al. 2012). LBP includes the tailbone and lower half of the back muscles. These muscles affect flexibility and posture. Thus, LBP greatly reduces the effectiveness with which a person can perform any given task. LBP is one of the most common causesof absence from schools, colleges, and workplaces (Nachemson 1983). LBP can also lead to disability and hence further decrease efficiency.

LBP can relate to problems with the lumbarregion of the spine, the vertebral discs, the ligament around the vertebrae, the spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen, or the skin covering the lumbar area. The most common causes of LBP include poor posture, prolonged sitting and lying down, working out, or lifting heavy weights (Frymoyer et al. 1983). Poor posture or unsupported sitting can cause loads to disperse incorrectly and, as a result, weaken the tissues of the lower back. In addition, incorrect posture can cause the development of several areas of stress within the muscle tissue, spinal joints, and discs.

Other causes include strains, disc injury, sciatica, spinal stenosis, abnormal spine curvatures, arthritis, fibromyalgia, spondylitis, and cancer (Albert et al. 2008). Strains can be caused by repeated heavy lifting or a sudden awkward movement that strains back muscles and spinal ligaments. In addition, several systemic diseases can cause referred pain in the lower back. These usually include tumors, infections, kidney disorders, digestive tract disorders, gynecological disorders, and fractures (Deyo 1986). Normal pregnancy and multi-parity are also frequent causes of LBP in women (Kelly-Jones and McDonald 1997).

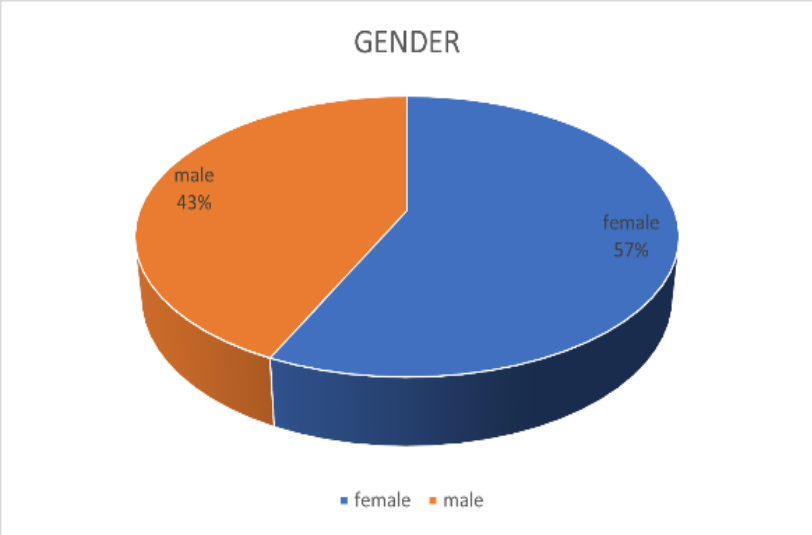

Figure 1: Gender distribution of the participants.

Many factors increase the risk of developing LBP. Aging, genetics, occupational hazards, sedentary lifestyle, excessive weight lifting, and obesity are all risk factors for LBP. The prevalence of LBP increases with age. Obesity and excess body weight put extra stress on theback. Excessive or improper weight lifting using the back instead of the legs can lead to back pain. Occupational factors can also cause LBP. Job requirements such as carrying heavy loads, operating heavy machinery, and prolonged sitting or standing are among the most common occupational risk factors (Frymoyer et al. 1983).

Psychological stresses can also cause LBP along with physical stresses (Valat, Goupille, and Védere 1997). If untreated, acute LBP in young individuals can persist as chronic pain as they age. Some risk factors are modifiable, and addressing the modifiable factors in most instances can lead to complete recovery (Vindigni et al. 2005).

Several personal risk factors contribute to LBP. Non-modifiable personal risk factors include age, gender, anthropometry, genetics etc. In comparison, modifiable risk factors include physical fitness, motor control, strength, obesity etc. (Nyland and Grimmer 2003). Most LBP patients are believed to recover spontaneously oversix-week time. However, this condition can worsen over time and persist as chronic pain in some individuals and displays several recovery patterns thatare affected by several other factors (Chen, Hogg-Johnson, and Smith 2007).

LBP interferes with the quality of life and work performance in older adults and young adults (Brennan et al. 2007). Many risk factors can cause LBP in medical students. These include, but are not limited to, a sedentary lifestyle, carrying heavy backpacks, cell phones, and computer usage. A large number of medical students tend to experience LBP. This usually occurs due to the time-consuming curricula of medical colleges that lead to a sedentary lifestyle (Lee and Graham 2001). Repetitively carrying heavy backpacks also contributes to the occurrence of LBP. Heavy backpacks not only cause LBP but neck and shoulder pain as well. Taller students experience more LBP as compared to shorter students carrying similar heavy backpacks(Heuscher et al. 2010).

Younger adults also use cell phones for longer periods of time as compared to older adults. Prolonged cell phoneusage predisposes to neck, shoulder, and LBP. Cell phone and computer usage on its own do not cause LBP, but the poor posture the individuals adopt while using these devices over an extended period of time

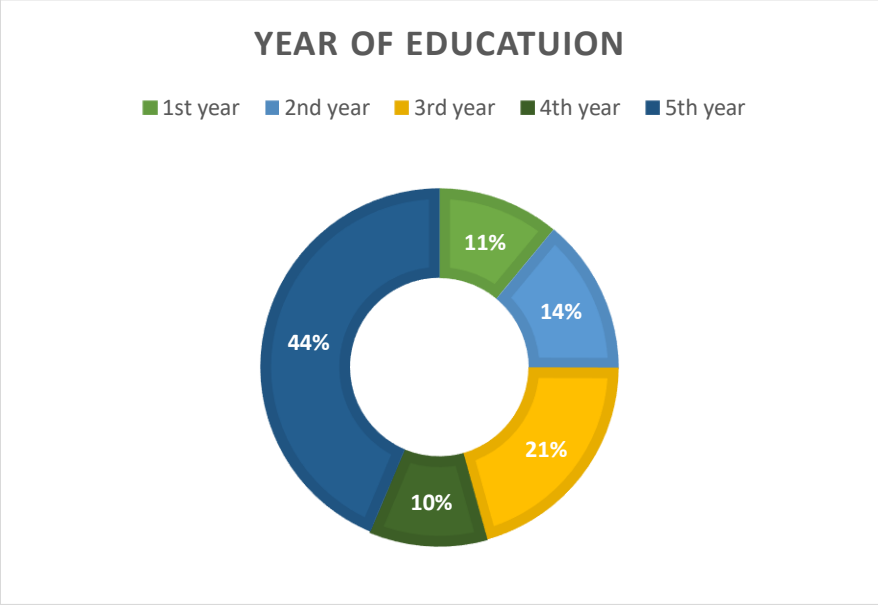

Figure 2: Total years of education of the participants.

contributes to the LBP (Korovessis, Koureas, and Papazisis 2004).

LBP is common among undergraduate medical students in Pakistan; however, there is not enough research on this subject matter in this south Asian region. The objective of conducting this research was to find out the LBP-related disability in undergraduate medical students, considering the difference in population, social and economic status, and other risk factors in Pakistan compared to othercountries.

2. Methods & Materials

This was a **c**ross-sectional study conducted at the medical colleges in Islamabad and Rawalpindi regionsof Pakistan during a period of 6 months. The study was done with 300 students using a convenience sampling technique. Medical undergraduate students, aged 18-25years, both male and female, and willing to participate were recruited, while pregnant women, and students with arthritis, bulging or ruptured discs, spinal fractures, and spinal deformity were excluded.

Data were collected using the Oswestry LBP disability questionnaire. It is an important tool for measuring a patient's permanent disability. The testis considered a gold-standard functional outcome tool. It has ten sections, and each section consists of six statements; if the first statement is marked,the section score will be zero. If the last statement is marked, the section score will be five. Once the questionnaire was completed, an index was calculated. If the index falls between 0-20%, it will be considered aminimum disability. 21-40% will be a moderate disability. 41-60% will be a severe disability. 61-80% willbe crippled. 81-100% are either bed-bound or exaggerating their symptoms.

Data were analyzed using the statistical package for the social sciences (SPSS) version IBM-21. The frequency of disability related to LBP was reported. The ethical approval was taken from the ethical review committee of the Margalla Institute of Health Sciences. Informed consent was taken from all undergraduate medical students before enrolment in the study to ensure their willingness and confidentiality of personal information.

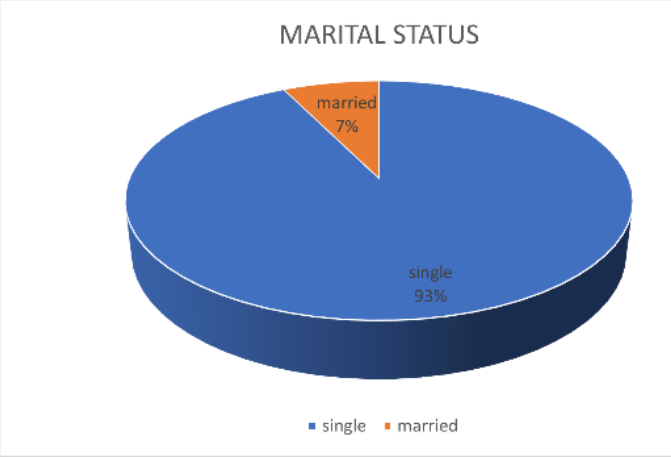

Figure 3: Marital status of the participants.

3. Results

A total of 300 students participated in the survey, of which 129(43%) were male, and 171(57%) were female (figure 1). The breakdown in figure 2 shows that there were 33(11%) students in first year, 42(14%) in second year, 62(20.7%) in third year, 32(10.7%) in fourth year and 131(43.7%) in final year. The pie chart (figure 3) shows that 278(92.7%) were single and 22(7.3%) were married participants.

Pain intensity at the time of the survey was reported as follows; 147(49%) had no pain, 115(38.3%) had mild pain, 32(10.7%) had moderate pain, and 6(2%) had reasonably severe pain. No participant was experiencing severe pain or worst pain (figure 4). The disability index was calculated, and the results were categorized into five different types of disability. There were 205(68.3%) students who had a minimum disability, 79(26.3%) had a moderate disability, and 16(5.3%) had a severe disability, but no one was in the crippled or bed-bound category (figure 5). Gender distribution results showed that 35% of females had a minimum disability, 20%had a moderate disability, and 2%had a severe disability, while in males, 33% had a minimum disability, 7% had a moderate, and 3% had a severe disability (figure 6).

The majority of the students fell in the minimum disability category, of which 31% were MBBS students and 37% were BDS students. About one quarter (26%) of students were included in the moderate disability; the breakdown was 15% MBBS students and 11% BDS students. Only a few students belonged to the severe disability category (5.3%), of which 3.3% were MBBS students. No BDS or MBBS participant was categorized into crippled or bed-bound disability (figure 7).

The graph (figure 8) shows that final-year students were in the majority in the following categories; minimum, moderate, and severe disability with the following percentages 28.3%, 12% & 3.3%, respectively. The 4th year students were the least (7.3%) present in the minimum disability class.

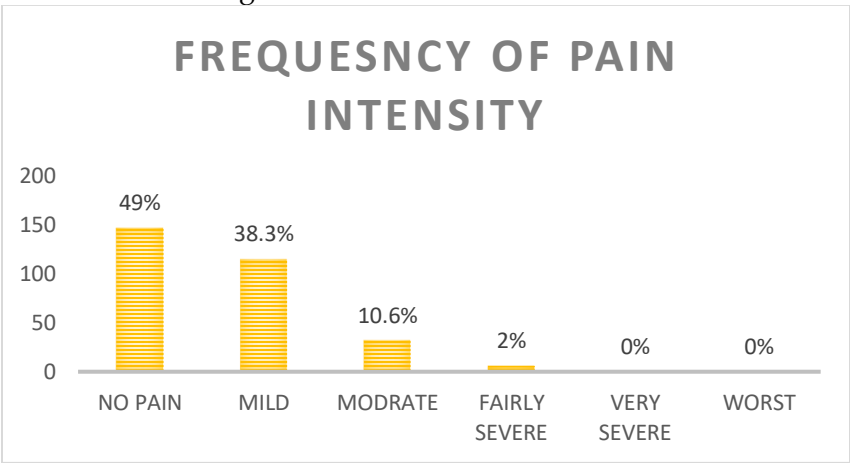

Figure 4: Frequency and intensity of the pain.

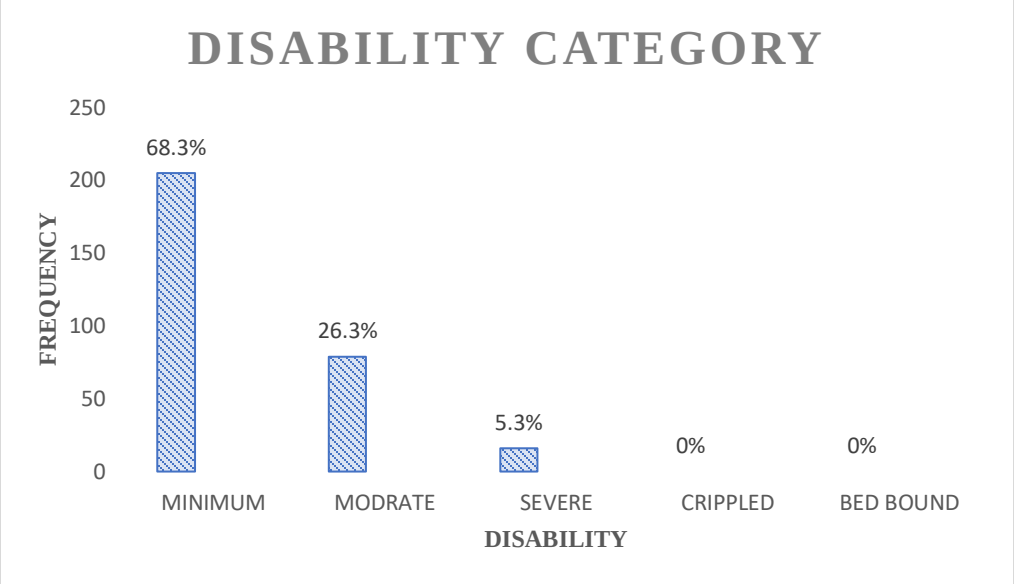

Figure 5: General disability category of the participants.

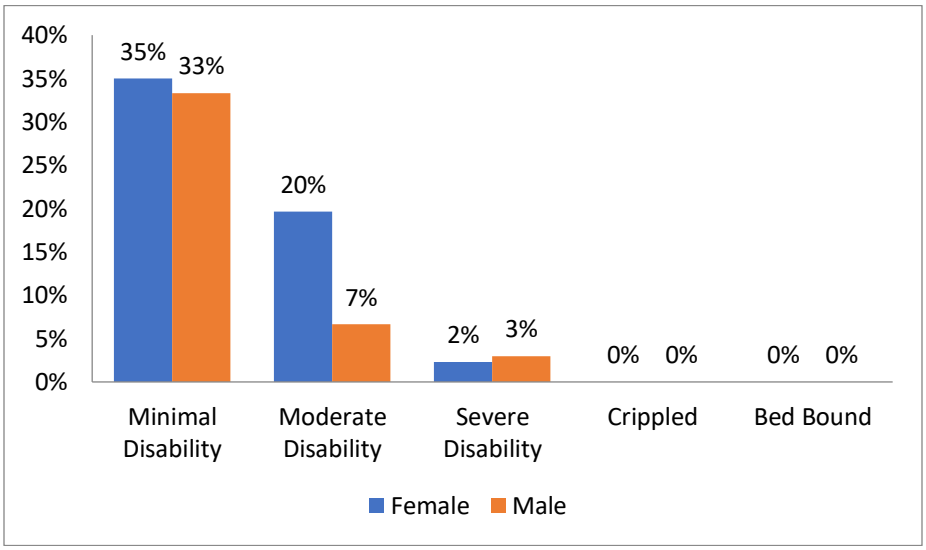

Figure 6: Disability between the male and female participants.

4. Discussion

The present study was carried out to determine the prevalence of LBP-related disability in undergraduate medical students of the Rawalpindi and Islamabad regions in Pakistan. The results of this cross-sectional study demonstrated that LBP-related disability is common among undergraduate medical students. The sample size was divided equally between the two disciplines, BDS and MBBS. The female gender was slightly overrepresented in our study, akin to many previous studies (Korovessis, Koureas, and Papazisis 2004, Vujcic et al. 2018, Taspinar et al. 2013). Marital status in our study was 7.3%, which was higher than at Taif University Saudi Arabia. They reported having only 1.7% of married students (Alturkistani et al. 2020).

The disability index was calculated using the scores from the Oswestry LBP disability

questionnaire, which the medical students filled. After calculating the disability index of each participant, they were divided into five different disability categories as follows; minimum, moderate, severe, crippled, and bed-bound disability. Our study showed 68.3% with a minimum, 26.3% with moderate, and 5.3% with severe disabilities. Panahi and colleagues conducted a study that showed similar results, with 66% of students suffering from a mild disability, 7% moderate disability, and 5% from a severe disability (Panahi et al. 2016). In our study, no participant fell in the crippled or bed-bound disability category, whereas in the study conducted by Batool et al, 8% of participants fell into the crippled disability category, and 1% were bed-bound (Batool et al. 2019).

Our study indicated that there is no significant difference in the disability percentage between the two disciplines, MBBS & BDS, as the results were very similar. There were 31% mild, 15% moderate, and 3.3% severe LBP students in MBBS, whereas in BDS, 37% were mild, 11% moderate, and 2% were in the severe disability category.

Disability was calculated for 1st to 5th-year students. It was found that 5th/final year students had the most disability percentage in the main disability categories, minimum, moderate, and severe. This might be due to the more clinical component of the program and increased clinical sessions as compared to other years (Vijay and Ide 2016). students commonly ignore the importance of posture and body alignment during practical sessions. A potential solution to minimize the issue of musculoskeletal pain among young students could be the improvement of work posture (Vijay and Ide 2016).

The prevalence of LBP (LBP) was 51% at the time the survey was conducted. Aymeric Amelot et al. reported a 72.1% prevalence of LBP, which is higher in comparison to our study (Amelot et al. 2019). Our study showed a significant difference in LBP intensity among males and females. 24.6% of females, while 13.6% of males reported mild pain, 6.6% of females, and 4% of males had moderate pain. This finding is supported by the study of Isidora Vujcic et al, which stated that the prevalence of LBP is significantly higher among female than male medical students (Vujcic et al. 2018).

LBP disability in medical students might affect activities of daily living such as; personal care, lifting, walking, sitting, standing, sleeping, sex life etc. Some were affected more than others, depending on their condition. These results were comparable to the results of a previous study (Batool et al. 2019). Lifestyle modifications, ergonomic adjustments, and improvements in the working place, such as height-adjustable stools, more complex saddle-style stools, using support arms etc, can help prevent musculoskeletal disorders (Samoladas et al. 2018). Also, a standing and sitting posture should be recommended as it reduces static muscle fatigue (Siivola et al. 2004).

In this study, 29% of the participants stated that their sleep was occasionally disturbed by LBP, while 5.7% stated that their sleep was limited to less than 6 hours due to the LBP. These results could negatively affect work performance. Similarly, previous studies have proposed that sleep deprivation causes depression, agitation, and poor academic performance in students (Maheshwari and Shaukat 2019).

Due to LBP, 70.3% of students complained of discomfort while sitting. Results showed that 35.7% of students could only sit in their favorite chair for as long as they wanted; in 25% of students, LBP prevented them from sitting for more than one hour at a given time, 9.3% of the participants reported that pain prevented them from sitting for more than thirty minutes, while 0.3% were unable to sit for more than ten minutes.

In our investigation, 38% reported that lifting heavy weights causes extra pain, 18.7% were

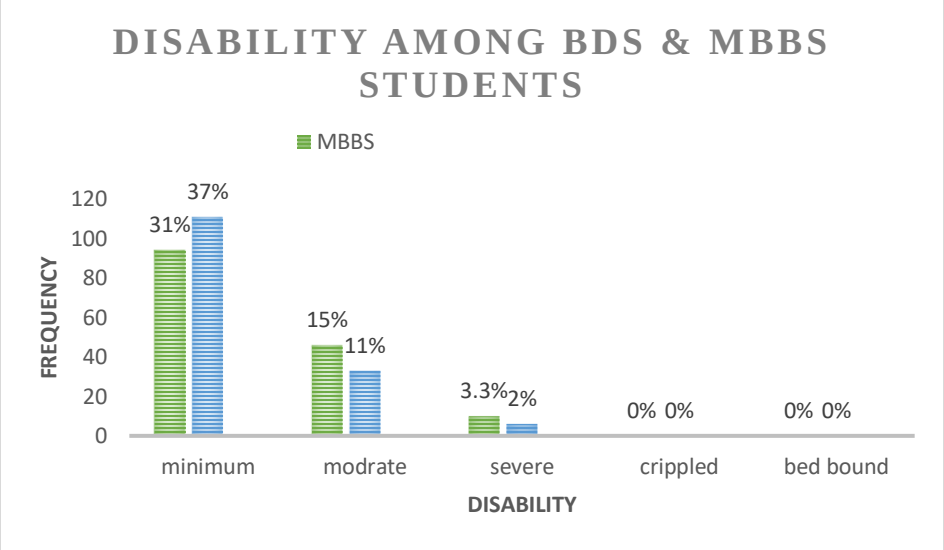

Figure 7: Disability between BDS and MBBS students.

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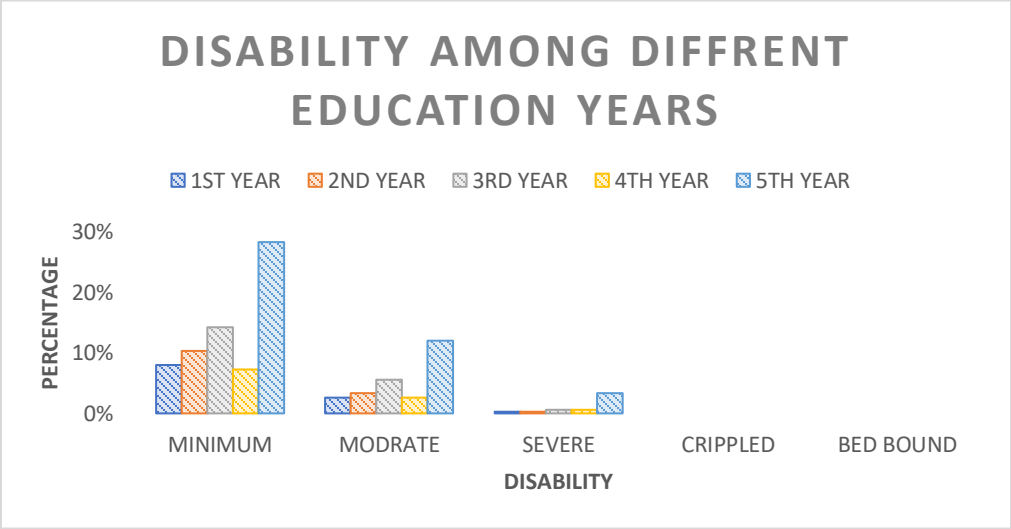

Figure 8: Disability with reference to the total number of education.

unable to lift heavy weights off the floor, 7.3% were only able to lift light to medium weights, 4.7% could only lift very light weights, and 1%of the participants were unable to lift or carry anything at all. Students may experience pain while lifting or carrying their bag packs due to excessive weight exceeding the recommended weight (Heuscher et al. 2010). Therefore, it is necessary to organize physical educationclasses to help students understand the correlations between body mechanics and other risk factors with LBP and its related disability. It would help students protect their backs and prevent LBP-related issues (Vujcic et al. 2018). We recommend that further studies can be directed at a larger sample size. Studies can be conducted to find out the LBP-related disability in medical and non-medical students. Further studies should consider risk factors related to LBP.

Here are some of the limitations of the study; the sample size of our study may not have been sufficient enough to generalize the result of our findings over a larger population. Our data collection was limited to only two institutes and

should be expanded to include other medical students from other universities in the country. Students may have had different perceptions of pain intensity, which may have caused bias in our results. No risk factors were considered during the research e.g., smoking habits, heavy activities etc. The questionnaireis online may have caused some difficulty in answering questions that may have caused variations in our results.

5. Conclusions

This study concluded that LBP-related disability is common amongst BDS and MBBS undergraduate students. The majority of the participants (68.3%) were categorized in the minimal disability category (0-20%). Females had a higher incidence of LBP-related disability, and final-year students had a higher frequency of disability compared to other years due to more clinical practice. This LBP-related disability affected activities of daily life.

Conflict of interest

The authors declare that they have no conflicts of interest to disclose.

Funding

There was no specific funding available for this project.

Study Approval

The review board of the Margalla Institute of Health Sciences in Rawalpindi, Pakistan, approved this study.

Consent Forms

Each participant signed a consent form. These forms are available with the authors.

Authors Contributions

AK conceptualized the study and wrote the initial manuscript, SN, and BA helped with the literature search analysis and writing the first draft, SN, and BA did the data collection and review of the studies, and AK supervised the whole project and wrote the final manuscript.

Acknowledgments

The corresponding author acknowledges the support of the Margalla Institute of Health Sciences Rawalpindi, Pakistan, throughout the project.

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