RESEARCH ARTICLE

Prevalence of low back pain with its associated risk factors among health science students

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Abstract:

Low back pain (LBP) has been recorded as a disease with the most numbers to cause the disability and postural condition. However, there are few studies on the prevalence of LBP and its associated risk factors among health science students in Malaysia. Therefore, a cross-sectional study was carried out to investigate the LBP prevalence and its associated factors among health science students enrolled at UiTM Selangor Campus. The LBP was assessed using the Modified Nordic Musculoskeletal Questionnaire which was distributed through an online survey (Google Form). A total of 322 participants took part in this study, of whom 25.5% were currently suffering from LBP. Factors significantly related to LBP were gender (p=0.029), year of study (p=0.036), history of LBP in lifetime (P<0.001), history of LBP for last 12 months (<0.001) and last 7 days (p<0.001), recovery time (p<0.001), type of school bag (p=0.031), work surface (p=0.036) and pressure while studying (p<0.001). However, the impact of performance in daily activities was not significantly associated with LBP. Awareness of the factors associated with LBP should be raised during studies to prevent the occurrence of LBP in health science students.

Keywords: Low back pain, health science student, risk factor, prevalence

1. INTRODUCTION

According to the Global Burden of Disease, low back pain (LBP) was defined as pain in the posterior region of the body from the lower region of the twelfth rib to the inferior gluteal fold, with or without radiation to one or both lower limbs, lasting for at least one day (Hoy et al., 2014). LBP was the most commonly reported cause of disability and postural problems (Algarni et al., 2017). A n estimated 12-80% of the younger population, especially university students, suffer from LBP (Nordin et al. 2014). The number of people living with LBP will gradually increase if not well treated (Hoy et al., 2014). Many studies have identified several risk factors as causes of this musculoskeletal disease (Morais et al., 2018, Hafeez et al., 2013, Vujcic et al., 2018, & Lewis and Battglia, 2019).

In general, risk factors for LBP can be caused by individual, physical work and psychological factors (Morais et al., 2018, & Hafeez et al., 2013). These factors are some of causes of LBP and place a great burden on health care systems (Morais et al., 2018). The individual factors of LBP were gender, age and year of study (Vincent-Onabajo et al., 2016). The physical factors of LBP are usually related to working position, such as sitting for a long time or sitting in an abnormal posture, which causes static muscle strain in the lumbar region (Vujcic et al., 2018). On the other hand, emotional and environmental factors are among the psychological factors associated with LBP (Lewis and Battglia, 2019). It is well known that these risk factors are prevalent among students, leading to an increasing prevalence of LBP.

Many studies show that undergraduate students have musculoskeletal problems, especially LBP. For example, 40.5% of respondents from Saudi Arabia reported LBP in the past week and 67.0% in the past year (Algarni et al., 2017). The results of one study in Malaysia indicated that the prevalence of LBP was higher (40.1%) than the previously

reported prevalence (Nordin et al., 2014). It is believed that among the students who suffered from LBP, the daily routine of studying and practical teaching in their respective courses was the reason (Nordin et al., 2014).

Due to the study routine, undergraduate students are exposed to longer study time. Increased use of computers and laptops, which has led to a decrease in physical activity, is thought to be associated with LBP (Hafeez et al., 2013). A report from India states that the average study time of more than 5 hours causes LBP in students and leads to a sedentary lifestyle (Ganesan et al., 2017). One reason for students sitting for hours is the long duration of their studies. In a study in Saudi Arabia it was found that 61.5 % of LBP was due to long sitting of more than 3 hours per day (Lucky et al., 2016). In addition, a study in Mumbai, India showed that physiotherapy students suffered from mechanical LBP. Thus, among health science students, physiotherapy students are more affected by LBP (Lucky et al., 2016).

Falavigna et al., 2011 reported that nursing, physiotherapy and medical students had the higher prevalence of LBP. About 60% of LBP events occurred as a result of work-related injuries (Falavigna et al., 2011). However, physiotherapy students are most exposed to work-related LBP risks compared to medical students (Falavigna et al., 2011). Full-time clinical practise of physiotherapy students is one of the risk factors for LBP (Vincent-Onabajo et al., 2016) as students engage in more 'hands-on' activities characterised by repetitive movements, prolonged standing and persistent awkward posture during clinical posting (Vincent-Onabajo et al., 2016 & Vujcic et al., 2018). Therefore, this could be a serious issue to deal with because as a student, you need to maintain your health and performance by taking preventive measure to avoid LBP.

LBP can have an impact on daily functioning such as sleep, academic performance and mood (Vujcic et al., 2018). As there are few studies on LBP among health science students in Malaysia, there is a need to further investigate this issue. Therefore, the aims of this study were to determine the prevalence of LBP and its associated risk factors among health science students.

2. MATERIALS AND METHODS

2.1 Study design

The cross-sectional study was conducted from September 2020 to February 2021 among Health Sciences students enrolled in Universiti Teknologi Mara (UiTM) Puncak Alam, Selangor, Malaysia with coordinates 3.2012° N, 101.4480° E, where approximately 2000 students reside during the study period. UiTM Research Ethics Committee approved the research protocol (REC/11/2020[UG/R/228]). The ethical issues that were considered in this study were the confidentiality of the participants. To ensure confidentiality, the identifiers of the respondents, such as names and addresses, were not written on the form.

2.2 Study sample/population

The participants in this study were health science students. The inclusion criteria were: i) male and female health science students, ii) age 18 years and above, iii) full time student, iv) ability to understand English language while students with recent trauma or surgery were excluded.

The sample size was calculated using a table formulated by Krejcie and Morgan. The estimated number of health science students during the study period, which was 2000, therefore 322 samples were required. Krejcie and Morgan's sample size calculation was based on the probability of a type 1 error is less than 5%.

2.3 Data collection

Data were collected using an online questionnaire distributed via an online survey form, namely Google Form. Subsequently, the data were analysed using the programme Statistical Package for Social Sciences (SPSS) version 20.0. The LBP was assessed using a Modified Nordic Musculoskeletal Questionnaire consisting of four sections. In the first section, the socio-demographic data of the subjects were recorded (i.e. age, gender, height, weight, study programmes, year of current study, smoking status, and alcohol and coffee consumption). In the second section, information was collected on the occurrence of MSDs in their lifetime, in the last 12 months, in the last 7 days and currently. This section also collected information on pain intensity, time to recovery, pain history (family history, history of symptoms) and use of a doctor. The third section covered the physical and psychosocial risk factors for back pain in students (i.e. lecture hours per week, internship hours, study hours, full-time clinical placement, computer and smart-phone use, sports activities, family pressure, study pressure, peer pressure, etc.). In the last section, information was collected on the impact of back pain on daily activities (skipping lectures, consideration of dropping out of studies, average sleep duration, sleep problems and academic performance).

2.4 Statistical analysis

SPSS version 20.0 was used for data analysis. Numerical data such as age and body mass index (BMI), pain intensity, family pressure, peer pressure, study pressure and academic outcomes were described as mean and standard deviation (SD). Frequencies and percentages were tabulated for the categorical data, i.e. gender, year of study, predisposing factors, history of low back pain, physical factors and impact of low back pain. Descriptive statistical analysis was

calculated using mean, standard deviation, frequencies and percentages for student demographics. The chi-square test, Fisher's Exact Test and independent t-test were performed to determine the association between the risk factors studied and the effect on LBP. A confidence level of 95% and a p-value of less than 0.05 were considered statistically significant.

3. RESULTS AND DISCUSSION

3.1 Socio-demographic characteristics and anthropometric data of participants

A total of 322 responses were included in the data analysis. Three quarters (75.2%) of the respondents were female followed by males (24.8%). The mean age of the study participants was 22.13 ±1.6 years, while the mean BMI of the participants was 22.01 ± 4.2 kg/m2. About two-thirds (62.1%) of the respondents were of normal weight (BMI 18.5 kg/m2 - 24.9 kg/m2). Overall, one third (36.6%) of the respondents were either underweight, overweight or obese (underweight=18.0%, overweight=12.1% and obese= 6.5%). About half (50.3%) of the respondents were fourth-year students. This was followed by 14.3% from the first year of study, 14.0% from the second year of study and 21.4% from the third year of study (Table 1).

Table 1. Demographic characteristics of the study sample, N=322.

Variable	N (%)
Gender	
Male	80 (24.8)
Female	242 (75.2)
Age (year), mean (SD)	22.13 (1.6)
Self-reported weight (kg), mean (SD)	56.24 (12.9)
Self-reported height (m), mean (SD)	1.59 (0.1)
BMI (kg/m2), mean (SD)	22.01 (4.2)
Underweight	58 (18.0)
Normal	200 (62.1)
Overweight	39 (12.1)
Obese	21 (6.5)
Year of Study	
First year	46 (14.3)
Second year	45 (14.0)
Third year	69 (21.4)
Fourth year	162 (50.3)

3.2 Study field of participants

Physiotherapy (34.2%), occupational therapy (15.2%), nursing (11.5%) and Environmental Health (11.5%) were the most frequently surveyed groups in this study, followed by dietetics and nutrition, Medical Lab Technology, optometry and Medical Imaging with 8.1%, 6.8%, 6.5% and 6.2% respectively (Table 2).

Table 2. Study field of participants, N=322.

Department	N (%)
Environmental Health and Safety	37 (11.5)
Medical Imaging	20 (6.2)
Medical Lab Technology	22 (6.8)
Nursing	37 (11.5)
Dietetics and Nutrition	26 (8.1)
Occupational Therapy	49 (15.2)
Optometry	21 (6.5)
Physiotherapy	110 (34.2)

3.3 Prevalence of current low back pain of participants

The results showed that of the 322 participants, a quarter (25.5%) of the health science students suffered from low back pain (Figure 1). Among the students with low back pain, the proportion of females (28.5%) was higher than that of males (16.3%) (Table 3). However, three quarters (74.5%) of health science students had not experienced low back pain recently.

There were some variables associated with low back pain, namely gender (p=0.029) and year of study (p=0.036). However, there was no association between age and BMI with LBP (Table 3).

3.4 Predisposing factors of low back pain among participants

Alcohol consumption (p=0.257), smoking (p=0.185) and coffee consumption (p=0.786) were studied predisposing factors for LBP. However, it was found that there were no significant association between all these predisposing factors and LBP (Table 4).

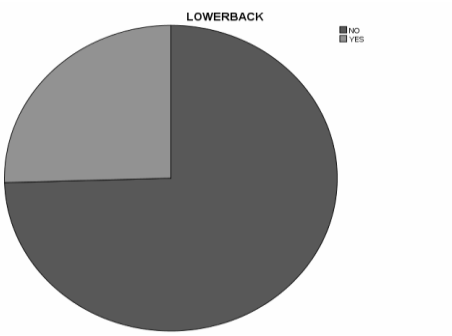

Figure 1. Proportion of participants who experienced lower back pain for the current days

Table 3. Demographic variables of the study sample with LBP, N=322.

Variable	Yes LBP N(%)	No LBP N(%)	p-value
Gender			0.029[a]
Male	13(16.3)	67(83.8)	
Female	69(28.5)	173(71.5)	
Age in year, mean (SD)	22.23 (1.7)	22.10 (1.5)	0.511[b]
BMI (kg/m^2), mean (SD)	22.78 (3.7)	21.74 (4.3)	0.057[b]
BMI category			0.152a
Underweight	8 (13.8)	50 (86.2)	
Normal	55 (27.5)	145 (72.5)	
Overweight	12 (30.8)	27 (69.2)	
Obese	6 (28.6)	15 (71.4)	
Year of Study			0.036[a]
First year	15 (32.6)	31 (67.4)	
Second year	4 (8.9)	41 (91.1)	
Third year	17 (24.6)	52 (75.4)	
Fourth year	46 (28.4)	116 (71.6)	

[a]Chi-square test, [b]Independent t-test

Table 4. Predisposing factor with LBP, N=322.

Variable	Yes LBP N(%)	NO LBP N(%)	p-value
Alcohol consumption			0.257[b]
Yes	2(50.0)	2(50.0)	
No	80(25.2)	238(74.8)	
Smoker			0.240[b]
Yes	4(44.4)	5(55.6)	
No	78(24.9)	235(75.1)	
Coffee consumption			0.786[a]
Yes	39(26.2)	110(73.8)	
No	43(24.9)	130(75.1)	

[a]Chi-square,[b]Fisher-exact test

3.5 The history of LBP in a lifetime, 12 months and seven days

In this study, history of LBP was evaluated by asking any experience of LBP in three time frames, which were any experience of having the LBP for a lifetime, in the last 12 months and in the last seven days. Pain intensity during the onset of LBP and whether participants opted for medical treatment were also recorded. Duration of recovery ($p<0.001$), seeing a doctor ($p = 0.106$), history of symptoms ($p = 0.985$) and family history ($p = 0.716$) were reported as history of LBP. Experience of LBP in the lifetime ($p<0.001$), in the last 12 months ($p<0.001$) and history of LBP in the last seven days ($p<0.001$) were significantly associated with LBP. Pain intensity and duration of recovery in days were also reported as significantly associated with LBP, $p=0.009$ and $p<0.001$ respectively (Table 5).

Table 5. History of low back pain, N=322

Variable	Yes LBP N (%)	No LBP N (%)	p-value
Lifetime			<0.001[a]
Yes	80 (38.1)	130 (61.9)	
No	2 (1.79)	110 (98.2)	
12 months			<0.001[a]
Yes	80 (43.2)	105 (56.8)	
No	2 (1.5)	135 (98.5)	
7 days			<0.001[a]
Yes	78 (69.6)	34 (30.4)	
No	4 (1.9)	206 (98.1)	
Pain intensity, mean (SD)	5.16 (1.7)	4.60 (1.6)	0.009[b]
Seeking medical			0.106[a]
Yes	11 (37.9)	18 (62.1)	
No	71 (24.2)	222 (75.8)	
Recovering duration (day)			<0.001[a]
3 days	46 (78.0)	13 (22)	
1 week	9 (10.8)	74 (89.2)	
>1week	9 (32.1)	19 (67.9)	
No recovery at all	18 (56.3)	14 (43.8)	
History of symptoms			.985[a]
Yes	11 (25.6)	32 (74.4)	
No	71 (25.5)	208 (74.6)	
Family history			0.716[a]
Yes	9 (28.1)	23 (71.9)	
No	73 (25.2)	217 (74.8)	

[a] Chi-square test, [b] Independent-t test

3.6 Physical factors associated with LBP

In terms of physical factors, there were several factors that would triggered LBP and recorded in this study, namely lecture hours per week ($p=0.851$), practical training per week ($p=0.073$), study hours per week ($p=0.511$), full-time clinical work ($p=0.411$), smart-phone use per day ($p=0.789$), computer use per day ($p=0.153$), type of school bag ($p=0.031$), work surface ($p=0.036$), hours of sitting per day ($p=0.580$) and awkward posture while working ($p=0.320$). However, for many of the physical factors that can be associated with LBP, only two factors showed a significant association with LBP, namely the type of school bag and the work surface, with $p=0.031$ and $p=0.036$ respectively (Table 6).

Table 6. Physical factors association with LBP, N=322.

Variable	Yes LBP N(%)	No LBP N(%)	p-value
Lecture hour per week			0.851[a]
<10hr	24 (24.5)	74 (75.5)	
11-15hr	31 (24.6)	95 (75.4)	
>15hr	27 (27.6)	71 (72.5)	
Practical training per week			0.073[a]
<3hr	35 (20.5)	136 (79.5)	
4-5hr	20 (28.6)	50 (71.4)	
>5hr	27 (33.3)	54 (74.5)	
Study hour per week			0.511[a]
<5hr	23 (21.5)	84 (78.5)	
6-10hr	40 (27.2)	107 (72.8)	
>10hr	19 (27.9)	49 (72.1)	
Full-time clinical			0.411[a]
Yes	36 (27.9)	93 (72.1)	
No	46 (23.8)	147 (76.2)	
Smartphone usage per day			0.789[a]
<5hr	13 (26.5)	36 (73.5)	
6-10hr	36 (27.1)	97 (72.9)	
>10hr	33 (23.6)	107 (76.4)	
Computer usage per day			0.153[a]
<3hr	8 (32.0)	17 (68.0)	
4-5hr	17 (18.3)	76 (81.7)	
>5hr	57 (27.9)	147 (72.1)	
Schoolbag			0.031[b]
Backpack	55 (22.5)	189 (77.5)	
Hand bag	17 (46.0)	20 (54.1)	
Duffel bag	3 (30.0)	7 (70.0)	
Messenger bag	2 (13.3)	13 (86.7)	
Tote bag	5 (31.3)	11 (68.8)	
Work surface			0.036[a]
Desk	51 (21.7)	184 (78.3)	
Dining table	15 (37.5)	25 (62.5)	
Bed	16 (34.0)	31 (74.5)	
Sports			0.240[a]
Yes	35 (29.2)	85 (70.8)	
No	47 (23.3)	155 (76.7)	
Sitting hour per day			0.580[a]
2-4hr	8 (21.6)	29 (78.4)	
5-7hr	36 (23.8)	115 (76.2)	
>8hr	38 (28.4)	96 71.6)	
Awkward posture			0.320[a]
Always	28 (28.6)	70 (71.4)	
Sometimes	54 (24.7)	165 (75.3)	
Never	0 (0)	5 (100)	

[a]Chi-square,[b]Fisher-exact test

3.7 Psychosocial factors associated with low back pain

Since part of the study was conducted at the beginning of a pandemic, psychosocial factors may have played an important role in the study participants. Family pressure (p=0.266), peer pressure (p=0.112) and study pressure (p <0.001) were asked to observed whether the psychosocial factors were associated with LBP in the study participants. The results show that study pressure (p<0.001) was the only one of the psychosocial factors associated with LBP (Table 7).

Table 7. Psychosocial factors for LBP, N=322.

Variable	Yes LBP Mean (SD)	No LBP Mean (SD)	p-value
Family pressure	4.13 (2.63)	3.79 (2.31)	0.266[a]
Peer pressure	4.63 (2.46)	4.17 (2.23)	0.112[a]
Study pressure	7.72 (1.87)	6.72 (2.20)	<0.001[a]

[a]Indepedent t-test

3.8 The impact of daily activities performance with LBP

LBP sometimes affected participants' daily activities during the pandemic. Skipping online courses (p=0.179), dropping out of studies (p=0.185), difficulty falling asleep (p=0.632) and academic performance (p=0.490) were the effects of LBP studied in this sample. However, none of the effects on performance in daily activities were significantly associated with LBP.

Table 8. Impact of daily activities performance and LBP, N=322.

Variable	Yes LBP N (%)	No LBP N (%)	p-value
Skip online class			0.179[a]
Yes	7 (8.5)	11 (4.6)	
No	75 (91.5)	229 (95.4)	
Quit program			0.185[a]
Yes	4 (4.9)	5 (2.1)	
No	78 (95.1)	235 (97.9)	
Average night sleep			0.465[a]
<5hr	15 (18.3)	41 (17.1)	
5-8hr	53 (64.6)	170 (70.8)	
>8hr	14 (17.1)	29 (12.1)	
Difficulty falling sleep			0.632[a]
None	28 (34.1)	88 (36.7)	
Mild	25 (30.5)	86 (35.8)	
Moderate	22 (26.8)	47 (19.6)	
Severe			
Academic result, mean (SD)	6 (7.3)	14 (5.8)	0.490[b]

[a] Chi-square test, [b] Independent-t test

3.9 Discussion

This study found that the prevalence of LBP among health science students was 25.5%. This is in line with findings from other countries where between 13.5% and 64.6% of students suffered from LBP (Nordin et al., 2014, Aggarwal et al., 2013, & Landry et al., 2008). The prevalence of LBP for the past 12 months was 57.5%, similar to Aggarwal et al. (2013) and Landry et al. (2008) who also reported that 48% and 59.6% of health care providers suffered from LBP in the past year. The same is true for the prevalence of LBP in Canada and the United States. Epidemiological studies found values between 4.4% and 33.0% for the general population in these countries, and the prevalence over a one-month period ranged from 35% to 52.2% (Thiese et al., 2014). These high numbers suggest that health science students have been in such a situation during clinical practise in the past year. This is due to the repetitive movements during work, twisting of the body during work, manual handling, lifting and fatigue (Ibrahim et al., 2019). Poor posture was the ergonomic factor that leads to decreased muscle strength, especially trunk muscles, where impair trunk motor control would cause reduce stability and coordination, sustain pressure on intervertebral discs and ligaments and may lead to injury or pain (Cargnin et al., 2017).

From this study, it appears that the current prevalence of low back pain is significantly different from previous reports. This could be because health science students did not go to hospital for clinical training last year due to the pandemic COVID-19. The prevalence of LBP was lower because the students were only doing online practical in which did not require manual handling and awkward postures while working. However, Shah & Desai (2021), found that using a computer or laptop for long hours of work in incorrect posture can also lead to LBP, in which is related to the situation during the COVID-19 pandemic where students had to complete the online learning phase. Therefore, some of the risk factors currently associated with LBP may be a little different from most reported studies.

The results of the study showed that the association between demographic characteristics and LBP were gender and year of study. There were more female than male among the 322 participants, most of whom were fourth-year students. This study showed that females (84.1%) were more likely to suffer from LBP than males (15.9%), which is similar to the study reported by Wáng et al. (2016) and Bento et al. (2020), who showed that females had a higher prevalence of LBP than males (60.9% versus 39.1%). This finding has been linked to the biological processes associated with menstruation (Wang et al., 2016). In addition, Issa et al., (2016) reported similar findings in their study where the prevalence of LBP among physiotherapy students in the fourth year of study was 37.2%. With increasing study duration, the incidence of LBP in physiotherapy students increased due to the educational exposure "treatment of patients" in the sense that none of the students were exposed to this exposure in the first and second year of study (Neyland and Grimmer, 2003).

No significant association was found between body mass index (BMI) and LBP. Contradicting findings have been reported previously where a significant association was found in an Australian study, and obesity was reported to be associated with LBP in an adult population (Hussain et al., 2017). The differences in the results could be due to the fact that the students participating in the study were within the normal range of BMI, in contrast to the Australian study. Weight gain can lead to increased mechanical pressure on the lumbar spine, resulting in changes such as decreased disc hydration, altered biomechanics and harmful stress distribution in the tissues, eventually leading to disc degeneration (Peng et al., 2017). Therefore, BMI may be a risk factor for LBP but not observed in our study.

In our study, the lifetime history prevalence of LBP in health science students was found to be 38.1%, annual prevalence was observed at 43.2% and 69.6% in current 7 days. These results are comparable to those of other countries. The lifetime prevalence of LBP was found at 47% and the annual prevalence of LBP was 34.3% among 268 health professionals (Simsek et al., 2017). The high LBP prevalence in our study could be due to online distance learning (ODL). Students have to sit in front of a laptop for longer periods of time to complete the training requirements. In the study by Şimşek et al. (2017), occupational LBP was found to be a common cause of injury due to variables such as heavy lifting, repetitive forward bending, sustained waist and body posture in awkward positions, and poor working conditions.

In addition, the type of backpack had a significant association with LBP, showing that backpack was the greater cause of LBP among students. Between backpack, handbag, duffle bag, messenger bag and tote bag, the handbag was the most common cause of LBP and was reported by 46% of students with LBP. The results are consistent with those of a previous study which showed that the mode of carrying a handbag was the reason for LBP. In a study by Amyra Natasha et al. (2018), carrying a single-shoulder bag caused more LBP than carrying a double-shoulder bag. A single-shouldered bag caused the greater spinal rotation during walking because it was an asymmetrical carrying style.

On the other hand, prolonged sitting at a computer or tablet is strongly associated with LBP. However, in this study, no significant association was found between prolonged sitting and LBP in health science students. This is due to the fact that health science students might apply ergonomics rules in their daily life. Significantly higher prevalence in students

who spend more than 10 hours on a computer or tablet compared to other groups. Prolonged sitting increases spinal pressure load (Al Shayhan & Saadeddin, 2018). In a study in Malaysia by Nordin et al. (2014), the prevalence of LBP was found to be higher in students who had studied for more than 3 years and sat for more than 4 hours per day. However, in this study, no significant association was found between sitting hours per day and LBP. This could be because the students were already on semester break at the time of data collection. Even though the association was not significant, other studies have shown that prolonged sitting is one of the risk factors for LBP in students.

Since Covid-19 was declared a pandemic leading to a nationwide lockdown, most people have had to change their work routines. During the nationwide lockdown, students have to continue the learning process online, which is called online distance learning (ODL). In this study, a significant relationship was found between workspace and LBP. The place where students preferred to work at home was the dining table, desk and bed. These findings are similar to Shah & Desai's (2021) study where 48.8% and 42.6% of the participants used an office desk/study table/dining table and bed/sofa/comfort chair respectively and found that they were not aware of the ergonomics causing LBP. There is a link between the workspace and LBP as different types of work surfaces allow for different working postures while working. In a study in India, it was found that a very large number of people chose poor working postures such as slouched shoulders, a slack back or sitting with shoulders raised as their daily working posture (Suresh, 2020). Therefore, participants should be aware of the work surface and postural requirements during the home study.

In addition to the physical factors associated with LBP, psychosocial factors are also one of the main factors leading to LBP. Psychosocial factors include family pressure, peer pressure and study pressure. In this study, study pressure showed a significant association with LBP. Study pressure can cause anxiety, psychological distress and emotional or behavioural disorders (Beynon et al., 2019). However, these findings differed from the study in the US, which found that physiotherapy or physical therapy students showed more positive thoughts compared to nursing, occupational therapy and medical students, which did not lead to the pressure associated with LBP (Lewis & Battaglia, 2019). Thus, these findings show different perspectives based on the students themselves.

Finally, LBP can impact quality of life (QoL), such as academic performance, sleep quality, and intention to leave school. This study showed no significant association between LBP and QoL. However, a previous study reported that the QoL of individuals with LBP was lower than students without LBP on physical and mental dimensions (Reza and Nejad, 2016). Physical quality of life, psychological quality of life and overall quality of life can be worsened by LBP (Reza & Nejad, 2016). In the study by Vujcic et al. (2018), LBP mainly affected students' sleeping (14.6%) and walking (12.0%), while in the current study, no association was found between QoL and LBP.

The high prevalence of LBP in health science students indicates the need to consider the importance of prevention of LBP. There is a need to educate students on how to prevent the occurrence of LBP. In terms of physical factors, raising students' awareness of correct posture should be integrated into teaching activities to reduce the annual incidence of LBP. Psychosocial factors can be difficult to manage; however, lecturers can help students by asking students' problems and reducing study pressure by giving the task or assignment based on students' abilities and flexibility during online learning.

This study had several limitations that should be improved in further research. The survey was conducted in only one faculty and should be extended to other faculties and universities to obtain a larger sample. The data on experiences with LBP is based on self-reporting, so there is likely to be information bias. In addition, the number of respondents is not the same for each degree programme, with the majority being from Physiotherapy Department. In addition, the questions in the questionnaire are not very detailed, which led to a lack of information. Therefore, the questionnaire should be more detailed in future studies as the current menstruation of the participants should be taken into account.

Despite its limitations, this study had several strengths. Firstly, this study was one of the few studies in Malaysia on the prevalence of LBP among health science students. Most of the previous studies dealt with the prevalence of LBP among medical students. Secondly, this study succeeds in examining the various risk factors for LBP and also includes the impact of LBP on daily routine as there is no study focusing on this issue in Malaysia.

4. CONCLUSION

In summary, the current study found that the prevalence of LBP was higher among health science students at 25.5%. Gender and year of study were found to be associated with LBP in health science students. Even though this study is only a questionnaire based, it contributes to the knowledge about the risk factors of LBP. The risk factors associated with LBP are known to be common in students, such as a history of LBP, work surface and type of school backpack are modifiable risk factors that should be considered in the prevention of LBP in students. The work surface can lead to poor posture and the 20-20-20 rule should be applied, meaning that every 20 minutes spent with a screen, look at something 20 feet away for 20 seconds and stretch yourself to minimise the occurrence of LBP. Students should be

encouraged to remain physically active in their daily routine to avoid a sedentary lifestyle. Awareness of the factors associated with LBP during study should be raised to prevent the occurrence of LBP in students.

ACKNOWLEDGEMENTS

The authors would like to thank all the members of the research team who conducted this study and all the students who participated in the study for generously giving their time to answer the online questionnaire so that we can learn more about LBP and work to improve the situation. This work was not funded. The authors declare that there are no conflicts of interest.

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