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ORIGINAL ARTICLE

The Association between Low Back Pain and Quality of Life among Health Sciences Students

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ABSTRACT

Introduction: Low back pain (LBP) is a growing public health problem that can affect anybody. However, little is known regarding the quality of life (QOL) of university students in Malaysia as consequences of LBP, especially among Health Sciences students. The goal of this study was to determine the association between QOL and LBP among Health Sciences students. **Methods:** Through convenience sampling, 96 Health Sciences students from a Malaysian university were included in this cross-sectional survey. The Oswestry Disability Index (OSW) Questionnaire and the Short-form 36 Questionnaire (SF-36) were used to collect the data. **Results:** According to the findings of this study, 93.8 percent (n=90) of the students had mild LBP, whereas 6.2 percent (n=6) had moderate LBP. There were no significant mean variations in LBP by gender, age, or course type (p>0.05). This study, however, discovered a significant negative relationship between all dimensions of QOL (general health, physical, and social function) and LBP disability (r=–0.24 to –0.40), p<0.05. This indicated that the students with a higher QOL score experienced less LBP. **Conclusion:** Finally, this research found a significant negative correlation between QOL and LBP in terms of general health physical function, and social function.

KEYWORDS: low back pain, quality of life, health sciences students, general health

INTRODUCTION

Low back pain (LBP) is becoming a major public health issue. LBP may affect people from all walks of life. The prevalence rate of low back pain among university students was 14 percent in 2000 and has increased as high as 67 percent in 2005. Previous research investigations were undertaken in Australia, the United States, Finland, Japan, China, Korea, and Turkey, among other industrialised nations [1, 2]. Many risk variables related to LBP such as age, gender, length of study, sitting posture, previous history of LBP, previous physical trauma, current part-time employment, and self-reported mental pressure have been discovered in previous research [2, 3, 4]. Young adults who are involved in clinical studies and patient care are particularly at risk for LBP such as students from nursing course [5, 6], physiotherapy course [7], dentistry course [8, 9] and medical course [8]. Since LBP can affect the quality of life of the individuals due to effects on the ability to work, previous study has used questionnaire such as the Health-related quality of life (HRQOL) to understand the relationship between LBP and quality of life. HRQOL is a newer, more sensitive, and hence more appropriate tool to measure chronic care outcome [10]. The use of standardised HRQOL tests can reveal the health state of diverse general populations, those who are in pain, and people who are experiencing LBP.

The association between LBP and HRQOL has been studied in several research. The majority of them involved adults, with fewer involving pregnant women, the elderly, children, and university students. A few studies in countries such as Japan, Italy, Brazil, France, and Croatia have found that back pain has a significant impact on individuals' quality of life [11-15]. A prior study found that schoolchildren with LBP had

decreased physical functioning, resulting in lower physical health summary ratings [15]. Another research investigates the prevalence of back pain in pregnant women who work in offices [16]. The study discovered that back pain during pregnancy has a considerable impact on the QOL with a high prevalence (84.6 percent). In 2019, a study in Malaysia examined the impact of backpacks on LBP in pre-university students and found no evidence that wearing a backpack caused LBP [17].

However, little is known about the effects of LBP on the QOL of Malaysian university students using widely accepted assessments. Understanding these facts could increase the awareness of local university authorities to improve the health of the students in the future. Numerous studies have been conducted on the quality of life (QOL) of students, which is influenced by their way of life, financial situation, academic performance, and LBP. An earlier study conducted in Middle east found a substantial mean difference in the QOL score depending on the participants' gender, socioeconomic situation, smoking status, and educational level [18]. Another study conducted in Brazil among students found a strong correlation between physical health and QOL. Physical activity, sleep, leisure time, and other activities fall under the domain of physical health. [19]. According to a research conducted among university students in Ukraine, physical activity has a positive relationship with QOL. From the findings using the International Physical Activity Questionnaire (IPAQ) as an instrument, the physical activity component of leisure time was found to have a favourable association with the mental health and physical component in the Short-form 36 Questionnaire (SF-36) [20].

Other than that, according to a study conducted among Saudi medical students, walking and sleeping are two daily activities affected by LBP by 30 percent and 80.7 percent of the students, respectively. In terms of gender, female students had LBP 1.6 times more frequently than male students [21]. Another study in Malaysia examined age, family income, and academic year as QOL predictors, and the study found that younger age groups, longer academic years, and higher family income had favourable relationships with QOL [22]. Another study found that medical students' depressive symptoms also had an impact on their QOL [18].

LBP can influence quality of life among individuals. The prevalence rate of LBP among university students was reported higher over the year of study from 34% to 74 % among health sciences students in Ethiopia in 2018 [23]. Previous study conducted in China revealed that 26.2% of college students suffer from chronic LBP [2]. Based on previous study in Australia among physiotherapies students, the risk of developing LBP is much higher among final year students aged 20 until 21, sitting looking down for more than 20 hours a week and treating patients significantly contributed to reporting having LBP in one week and within one month [3]. Back pain was shown to be more common in nursing students during their final year of education than in earlier years of study. Additionally, working in a bent position was substantially associated to back pain [6] . A study on the incidence of pain in the neck, shoulder, and back among dental students in the Saudi found that it was 61.4% prevalent. Long clinical hours, a higher BMI, a history of trauma, and a lack of exercise were all contributing factors to the pain. Furthermore, the findings showed that 67.1% of medical students had LBP within the previous year. Those who had a history of back injuries and those who did not regularly exercise had a higher risk of LBP [21].

HRQOL Students' QOL is influenced by their way of life, financial situation, academic performance, and LBP. On the QOL of students, numerous studies have been done. Meanwhile, SF-36 has also been widely used including in Malaysia among communities [24] and students [25], in order to understand QOL [22]. A study among the community in Kelantan used SF-36 to understand the health intervention about the knowledge, attitude and practice in community of health programme [24]. Meanwhile SF-36 were also used to determine QOL among university students in Negeri Sembilan during Covid-19 pandemic [25].

Additionally, it might inspire university administrators to plan and advertise events aimed at reducing health-related LBP, like encouraging students to engage in sports as a recreational activity on campus, hosting a workshop on stress management, and encouraging them to adopt ergonomically sound posture. This study's objectives were to identify the various levels of LBP severity, including mild, moderate, and severe LBP, as well as the variations in

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LBP and QOL based on demographic variables including gender, age, type of course, and educational level. Additionally, the study aims to establish the association between LBP and QOL in university students and to compare LBP scores by gender, academic year, and courses. In addition, the study sought to examine the association between LBP and QOL.

MATERIALS AND METHODS

Subjects and study design

A cross-sectional study was conducted among undergraduate and graduate students studying Health Sciences between 20 and 50 years old. The study subjects were the students from the Faculty of Health Sciences of a public university in Kuala Lumpur, Malaysia. The inclusion criteria was registered university students aged between 20 and 50. Those with underlying physical health issues relating to back discomfort, such as spinal cord damage, post-surgical procedure, slip disc, or scoliosis, as well as students who were pregnant or taking psychiatric medications were excluded from the study.

Data collection

The sample size was calculated based on the formula $n = [(Z_{\alpha/2})^2 P(1–P)] /d^2$ where n is the population size, Z is the statistic for a level of confidence, P is the expected proportion, and d is precision [26]. The expected prevalence of low back pain among the university students based on previous studies is 0.4 [4] and the precision is 10%. The calculated sample size was 93. However, considering possible 10% dropouts, 102 subjects made up the expected entire sample population.

The data was collected using a self-administered, structured questionnaire. The modified Oswestry Disability Scale Questionnaire (OSW) and the SF-36 Questionnaire were used to collect the data [27, 28]. Age, gender, classes, race, and academic level were among the demographic variables collected from the respondents. Google Forms were used to distribute the questionnaires, and the respondents responded online.

The modified OSW was used to assess the severity of LBP. The questions in the modified OSW were evaluated on a 5-point Likert scale, with a maximum score of 5. The Likert scale ranged from 0 to 5, with 0 denoting no constraint and 5 denoting the most severe movement [27]. There was a 100-point maximum for all the ten questions. The range for the category was 0 to 20 for mild, 21 to 40 for moderate, 41 to 60 for severe, and over 60 for severe limitation on walking and performing other daily tasks. [28, 29].

There were eight dimensions and 36 questions in total in the SF-36 questionnaire. Physical function, physical discomfort, physical roles, and general health made up the physical components. In the meantime, mental health, energy, emotional stability, and social functioning were considered mental health components. Based on the available information, the raw scores of eight quality of life-related to health domains were computed, and the results were then transformed to a standard score between 0 and 100. The scale had a range of 0 to 100, with 0 denoting poor health and 100 denoting great health [30]. Convenience sampling was employed for the sampling process.

Data analysis

SPSS Version 20.0 was used to analyse the data. The percentage of respondents who suffered from LBP was calculated using descriptive analysis. The independent *t*-test and one-way ANOVA test were employed for continuous data to examine the mean differences of the variables namely LBP and QOL with demographic characteristics. The Mann-Whitney U test and Kruskal Wallis H test were used to compare between groups when the data were not normally distributed. Age, gender, course, and educational level were among the independent factors. In order to determine the relationship between the LBP and QOL components (general health, physical function and social function), the Pearson/Spearman Correlation test was used. Finally, a correlation test between the QOL and LPB domains was conducted.

RESULTS

This study included a total of 83 female and 13 male students (Table 1). The majority (n = 85, 88.5 percent) were between the ages of 19 and 30, while only (n = 11, 11.5 percent) were between the ages of 31 and 40. The age group statistics were practically identical to the

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academic level of the students, with 79.2 percent having a bachelor's degree and 20.8 percent having a master's degree. The students who completed the OSW questionnaire scored 93.8 percent (n=90) in the mild disability group and 6.2 percent (n=6) in the moderate disability group (Table 2).

The QOL data comparing the gender and educational level were not normally distributed in this study. As a result, descriptive data were provided as median and interquartile range (IQR). The findings on the QOL score based on the demographic characteristics revealed that female students had a higher median QOL than male students. Meanwhile, postgraduate students had a higher QOL score than those with a bachelor's degree. Furthermore, compared to students from other courses, the mean QOL score of the Biomedical Science students was found to be higher. The age group above 30 was found to be higher than the lower age group. However, there was no statistically significant difference in the QOL scores by gender, age, course, or academic level (p>0.05) (Table 3).

Table 4 shows that the median LBP was greater among female students than male students. Meanwhile, the Rehabilitation courses had a greater rate of LBP than the other courses. Furthermore, the median between age groups was the same for both age groups. However, there was no statistically significant difference in the median LBP scores depending on the demographic parameters including gender, age, course, or academic level (p>0.05).

A further analysis was performed to establish the strength of the association between all of the QOL components, which included general health, physical function, and social function. It was discovered that the presence of LBP disability had a substantial negative association. The strongest association was found between the physical function domain in QOL and LBP (r=−0.404, p<0.001) (Table 5). The correlation coefficient values were all negative (LBP and general health, r=−0.238, p<0.01), (LBP and social function, r=−0.238, p<0.05), indicating that those with greater physical function, general function, and social function scores had a lower score of LBP. This indicated the higher the score of physical function, general function and social function, the lower the score of LBP.

Table 1 Demographic characteristics of the respondents

Characteristics	N (%)
Gender	
Male	13 (13.5)
Female	83 (86.5)
Course	
Biomedical Science	43 (44.8)
Optometry	18 (18.8)
Nutrition & Dietetics	22 (22.9)
Rehabilitation	5 (5.2)
Others	8 (8.3)
Age group	
19 – 30 years old	85 (88.5)
31 – 40 years old	11 (11.5)
Level of education	
Bachelor's degree	76 (79.2)
Master's degree	20 (20.8)

Table 2 Category of low back pain among the respondents

Category of low back pain	N (%)
Mild disability	90 (93.8)
Moderate disability	6 (6.2)

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Table 3 Mean difference and median difference between QOL (general health) scores and demographic characteristics

Characteristics	N (%)	Mean ± SD	Median (IQR)	t//F/U	*p*
Gender					
Male	13 (13.5)		60.0 (10)	507.0	0.72
Female	83 (86.5)		65.0 (20)		
Course					
Biomedical Science	43 (44.8)	67.0 ±15.4		0.53	0.72
Optometry	18 (18.8)	65.0 ± 14.1			
Nutrition & Dietetics	22 (22.9)	61.6 ± 16.7			
Rehabilitation	5 (5.2)	66.0 ± 7.4			
Others	8 (8.3)	62.5 ± 13.9			
Age group					
19 – 30 years old	85 (88.5)	64.8 ± 14.8		−0.23	0.82
31 – 40 years old	11 (11.5)	65.91 ± 16.7			
Level of education					
Bachelor's degree	76 (79.2)		65.0 (20)	753.5	0.95
Master's degree	20 (20.8)		67.5 (14)		

*Significant $p<0.05$

Table 4 Median difference between LBP scores and demographic characteristics

Characteristics	n (%)	Median (IQR)	U/H	*p*
Gender				
Male	13 (13.5)	0 (6)	409.5	0.16
Female	83 (86.5)	4 (10)		
Course				
Biomedical Science	43 (44.8)	4 (8)	3.312	0.51
Optometry	18 (18.8)	7 (12)		
Nutrition & Dietetics	22 (22.9)	2 (10)		
Rehabilitation	5 (5.2)	10 (16)		
Others	8 (8.3)	5 (16)		
Age group				
19 – 30 years old	85 (88.5)	4 (11)	452.5	0.86
31 – 40 years old	11 (11.5)	4 (6)		
Level of education				
Bachelor's degree	76 (79.2)	4 (11)	636.0	0.25
Master's degree	20 (20.8)	4 (6)		

*Significant $p<0.05$

Table 5 Correlation between LBP and QOL components

QOL Components	r	*p*
LBP & QOL – General health	−0.283	0.005*
LBP & QOL – Physical function	−0.404	<0.001**
LBP & QOL – Social function	−0.238	0.019*

*Significant $p<0.05$
**$p<0.001$

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DISCUSSION

In this study, the relationships between LBP and students' QOL were examined. From the descriptive analysis, majority of the students (90.3%) had mild low back pain. The results differed from earlier studies that reported undergraduate students (40.3%) [31] and medical students (70.3%) had LBP [10]. Comparing between students and healthcare workers, a study in Saudi Arabia discovered that almost 70.3% of the healthcare workers had LBP [32]. The fact that the respondents in this study were from various courses and had varying learning hours, practical sessions, and clinic hours may be the reasons of these differences in the percentage. Some students might spend a greater amount of time in clinics than others who attended more lectures. Other than that, students who spent more time in the clinic for their practical sessions may have a more severe LBP. However, because the respondents were chosen using a convenience sampling technique, the comparison of courses for LBP and QOL was not significant. Therefore, the respondents for each course were not representative of the course, especially those from clinical courses such as Optometry and Rehabilitation, which were low in number.

Future health and QOL issues caused by LBP can be mitigated by early prevention and health interventions such as adopting good body mechanics when carrying heavy objects [33]. The demographic data such as gender, age, and course were considered when comparing the LBP and QOL scores in this study. The data, however, showed that LBP did not significantly differ by gender, age, or course. Since the respondents in this study were students, the variation in the OSW scores and the workload associated with assignments, presentations, and other campus activities may have been nearly identical, which could account for the study's non-significant findings. Majority of the respondents were female, hence there was no discernible gender difference. There were no variations in LBP between age groups when comparing Physiotherapy and Medicine students, according to the findings of this study, which were similar to those of earlier studies [34]. Despite their age, a study on Austrian medical students indicated that the LPB score among them was significant between age groups but not significant between genders [35].

Another study found that different programmes or courses were associated with a higher frequency of LBP, with physiotherapists being at a higher risk than medical students [36]. Another study among nurses found that lifting heavy objects is one of the main factors that caused back discomfort [6]. This is supported by another study on healthcare workers who must conduct manual handling duties [37]. These might have been connected to the back-injuring tasks they performed on a daily basis at work, such as transferring patients, carrying heavy equipment, and supporting patients during treatment. Although we collected the data from a variety of courses, the results showed no differences. This was because the responses from the respondents taking Rehabilitation course were the least, while majority of the respondents were taking other courses namely Biomedical Science, Optometry, and Nutrition and Dietetics.

In this study, the mean difference between QOL and demographic factors was examined. However, the findings showed that there was no statistically significant variation among the respondents. This was possibly because the students' QOL tended to be very consistent across genders, age groups, courses, and educational levels. This was also because the overall SF-36 scores, which included social functioning, physical activity, mental health, and general health domains, were nearly identical or barely different between undergraduate and graduate students. We propose for future research to incorporate other demographic factors such as socioeconomic status and place of residence. A few studies have discovered that the respondents' QOL varied significantly depending on the demographic factors such programme phase and duration [36], academic year and family history, weight and height, body mass index (BMI) [38], and socioeconomic status [11, 39, 40].

A correlation analysis was carried out to better understand the relationship between LBP and QOL of the students. This study found a strong correlation between LBP scores and QOL, showing that the students with lower scores has better QOL. This finding is in line with the past studies that suggested that LBP affected the students more than the those who did not suffer from the condition [39, 41]. Numerous studies support this conclusion by showing how poor physical

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health such as LBP affected the well-being of different populations, including community members and office workers [42-44]. Persistent LBP may affect the young adults' functional capacities and work status because it has been associated with a low QOL [45, 46]. Therefore, preventing LBP is essential for a higher standard of living in the future.

This study has several limitations. Since it was a cross-sectional study, the aetiology of the LBP was not identified. Second, the majority of the sample was made up of female undergraduate students. Future research should also take into account additional variables such as BMI and physical exercise.

CONCLUSION

In this study, 93.8 percent of the Health Sciences students had mild LBP. This study found that the LBP scores did not significantly differ across the demographic parameters. LBP and QOL had a slight yet substantial correlation. Even though the majority of the students experienced mild LBP, further research on the factors including physical activity, lifestyle, and BMI in relation to LBP is suggested.

Conflict of interest

Authors declare none.

Authors' contribution

1st author was involved in data collection and manuscript draft. 2nd author was involved in methodology, concept, and data analysis. 3rd author was involved in data analysis and manuscript editing while 4th, 5th, 6th and 7th involved in data collection.

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