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Quality of Life and Intensity of Pain among Students with Low Back Pain during the Covid-19 Pandemic

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Abstract

Background The Covid-19 pandemic affects students' physical, psychological, social, and quality of life (QOL). **Objectives** To identify the prevalence of LBP, pain, and QOL; and determine the association between pain and QOL among students with LBP. **Methods** 420 students were recruited from the Faculty of Health Sciences. **Limitations** There was a lack of studies investigating QOL and pain among students with LBP. **Findings** 350 students were included for analysis with 60.6% experiencing LBP. Significant differences were found in QOL and pain among students with and without LBP. **Implications** A high prevalence of LBP among students affects pain and QOL.

Keywords: Low back pain; pain intensity; quality of life; Covid-19

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1.0 Introduction

The lockdown during the pandemic Covid-19 outbreak reinforced the global population to stay at home and follow restricted outdoor activities leading to a reduction in active participation in physical activity (Song et al., 2020). This scenario promotes a decline in physical activity, increased pain intensity, and other symptoms of low back pain (LBP). The classification of LBP by the World Health Organization (WHO) states that LBP that occurs within <6 weeks is considered acute LBP, LBP that lasts 6-12 weeks classifies as sub-acute LBP, and LBP that persists for more than 12 weeks is considered as chronic LBP (Nasution et al., 2018).

LBP is one of the common musculoskeletal disorders that presented with high prevalence, affecting up to 84% of adults in the world population (Saracoglu et al., 2020; Allegri et al., 2016). The prevalence of LBP seems to increase two-fold among adults and continues to rise in numbers among the elderly for both men and women. Furthermore, LBP is rated as the ninth most common complaint in public and has a prevalence of 12% among the population in Malaysia (Hani & Liew, 2018). The risk factors for LBP include obesity, age, psychosocial factors (stress, anxiety, and depression), occupational factors, postural habit, and level of physical activity. There is a high prevalence of

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LBP among university students which might be due to the curriculum's high demand during studies, exposure to higher stress levels, and a sedentary lifestyle as time occupied for learning and rest (Vujcic et al., 2018).

University students tend to have prolonged sitting during a lecture that exaggerates pain. There might be the presence of symptoms during the night that causes loss of sleep for students and lead to fatigue for the next day. The condition eventually leads to inclined stress levels among students and further worsens pain, thus reducing their QOL (Arya, 2014). In addition, the lockdown enforced by the government led to changes in the conservation of the study among university students, where they require to replace traditional exams with online assessment tools. This is a new area for students and may lead to increased work burden and stress levels due to their unfamiliar atmosphere for study. The lockdown during a pandemic may affect their attendance of lectures, productivity, and level of physical activity, thus reducing their QOL. Moreover, pain intensity may further affect QOL as it causes limitations in physical function (Guclu et al., 2012). However, Nasution et al. (2018) stated that pain intensity might not significantly determine QOL among patients with chronic LBP.

Therefore, the objectives of this study were to i) identify the QOL among students with and without LBP; ii) to determine the association between QOL and pain intensity among students with LBP in the Faculty of Health Science, Puncak Alam campus during the pandemic Covid-19 outbreak.

2.0 Literature Review

2.1 Prevalence of LBP among universities students

LBP is one of the common musculoskeletal disorders with high prevalence, especially among adults (Saracoglu et al., 2020; Allegri et al., 2016). Lack of physical activity, stress, and mechanical life are the factors that lead to a higher prevalence of LBP, especially in developing countries (Panahi et al., 2016). Low back pain is currently one of the leading causes of disability among the various age groups in the world, from children to adults, accounting for 1.3% of approximately 214 million visits to primary care in the United States in 2010. This condition has over 70% prevalence in developing countries, and 10% of the population is unable to work due to disability (Alarab & Narin, 2018; Hani & Liew, 2018; Nasution et al., 2018).

The high demands of the curriculum during learning cause students to have a sedentary lifestyle, improper postural habits, and exposure to stress leading to an increased risk of high LBP prevalence among the populations. This contributes to a reduction in QOL among the student that causes LBP (Vujcic et al., 2018). The symptoms of pain may be triggered by prolonged sitting during lectures, during physical activity, and during dressing (Arya, 2014).

Moreover, there is a significant decrease in QOL of students with pain associated with LBP compared to those without LBP. Besides, all aspects of QOL, including physical, psychological, and social can be reduced among students with LBP (Panahi et al., 2016). LBP can be considered a common factor of absence from lectures, reduced productivity, and poor QOL among university students, as the symptoms may affect an individual activity of daily living.

2.2 Impact of LBP and pain intensity on QOL

LBP may lead to the reduction of QOL as it will affect the activity of daily living due to the symptoms. The pain associated with LBP can affect individual independence in everyday life leading to worse functional disabilities such as dressing, sitting, standing, or walking (Alarab & Narin, 2018). The pain may worsen with physical activity, thus leading students with LBP to rest and sleep during free time and avoid performing any exercise (Vujcic et al., 2018). However, studies have shown that exercise and physical activity positively reduce pain and improve physical function (Saracoglu et al., 2020; Setchell et al., 2019). Thus, the avoidance of performing exercise may not warrant a positive effect on students with LBP. Furthermore, patients with LBP tend to wake up at least twice after a night's sleep. This eventually causes stress due to sleep disturbance among them. This event causes a negative impact as they can lose their focus in class, not attend any lectures the next day, or are unable to perform any work efficiently due to fatigue (Choi et al., 2014).

Another factor that can lead to the reduction of quality of life among the population with LBP is pain intensity. Activities such as chores and sports may trigger pain associated with LBP that will lead to a limitation of their participation in everyday life (Guclu et al., 2012). A study has shown that increased intensity of pain will cause a reduction in quality of life among patients with LBP, especially regarding their mental state. However, there is a weak association between sleep disturbance and intensity of pain among the population (Choi et al., 2014). Additionally, the level of pain and how an individual perceives the pain also play a big role in determining the quality of life. The quality of life seems to be lower in women than men, as the prevalence of LBP is 1.15 times higher and significantly increases with increased age (Husky et al., 2018; Hadziomerovic et al., 2017). Pain sensitivity in women is higher than in men for most pain modalities may lead to a further reduction in quality of life among women (Okokon et al., 2016). A study by Saya et al. (2016) showed a significant correlation between pain and quality of life among women with LBP when used WHO-BREF to measure the quality of life.

Several studies suggest a reduced quality of life is related to pain intensity among the population with LBP (Nasution et al., 2018; Guclu et al., 2012). However, a study by Nasution et al. (2018) stated that pain intensity might not cause a significant role in determining QOL among patients with chronic LBP. Up to now, only a few studies were found to determine the association between LBP and pain intensity among university students in recent years (Vujcic et al., 2018; Panahi et al., 2016). Therefore, more studies should be conducted involving these two variables to determine their correlation among students with LBP.

3.0 Methodology

A cross-sectional study with purposive sampling was conducted among students of the Faculty of Health Science, Universiti Teknologi Mara, Campus Puncak Alam. The ethics approval was obtained from the University Research Ethics Committee (REC) UiTM Shah Alam, Selangor (Ref: REC 2/2019 Rev 3 (2020)). The questionnaires were distributed to the respondents using an online platform. The participants also provided demographic data such as gender, age, weight, height, and body mass index.

The inclusion criteria for the study were undergraduate students in the Faculty of Health Sciences of the university, aged between 19 to 24 years old. Participants were excluded when they were postgraduate students of the Faculty of Health Science and had chronic illnesses and other health problems.

The sample size was calculated by using Raosoft software. The parameters were set with: Margin error = 5%, Confidence level = 95%, Study population = 2018 (1735 and 283 for degree and diploma students respectively) from Faculty of Health Science UiTM Puncak Alam, Response distribution = 50% and Recommended sample size = 323. However, when considering a 30% attrition rate, the sample size was 420.

Self-administered questionnaires were used to evaluate QOL and pain. A 12-Item Short Form Survey version 1 (SF-12v1) questionnaire was used to measure the QOL. It consists of physical health scores (PCS) and mental health scores (MCS). The questionnaire includes physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH) that scored from 0 to 100. Pain intensity for chronic LBP is measured using the 10-point Numerical Rating Scale (NRS), which ranges from no pain = 0 to the worst possible pain = 10. The pain rating scales are interpreted as 0=no pain, 1-3= mild pain, 4-6=moderate pain, and 7-10 severe pain (Karcioglu et al., 2018).

The data were analyzed using SPSS software version 20.0. The demographic characteristics of the participants were analyzed using descriptive analysis. The comparison of means for QOL among the students with LBP and NLBP was analyzed using an independent t-test, and the association between the QOL and pain intensity among the students with LBP was analyzed using chi-square analysis.

3.1 Procedure

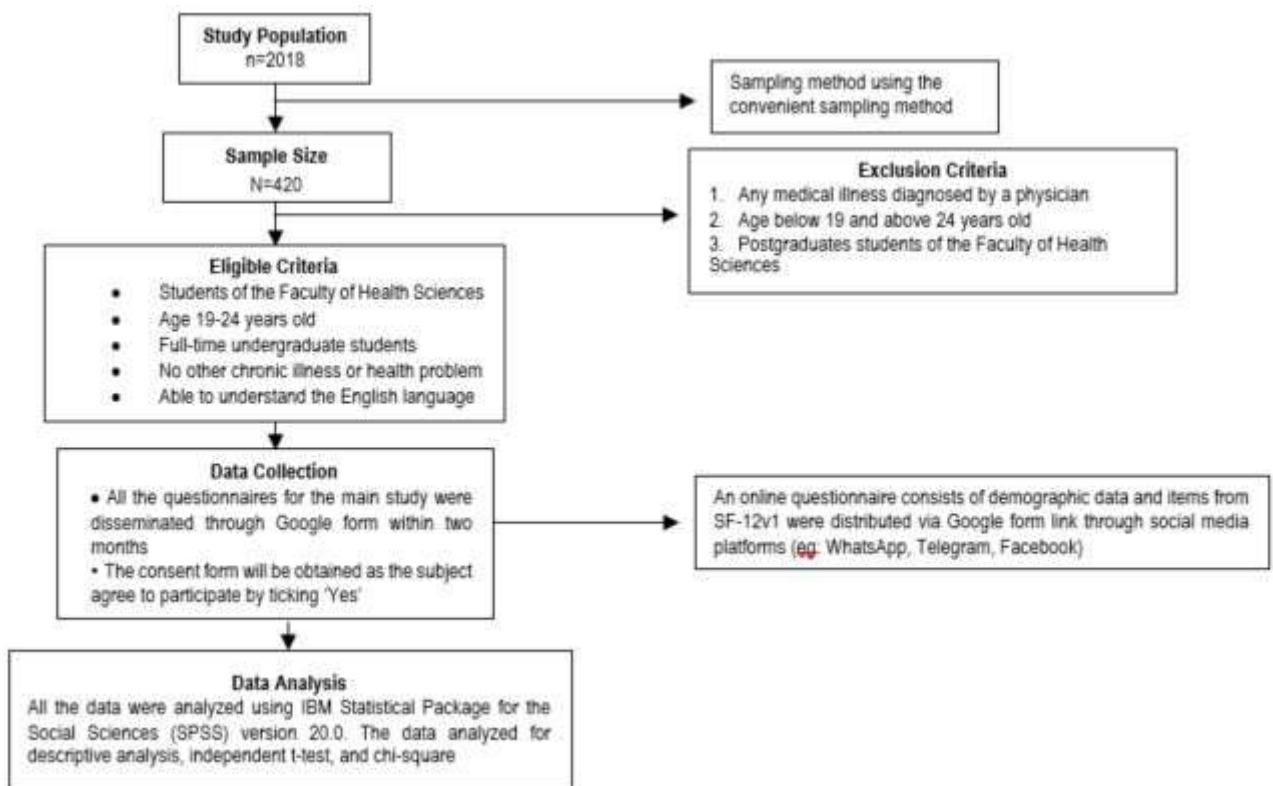


Figure 1: The flow chart of the study

4.0 Findings

4.1 The demographic characteristics of the participants

There is a total of 350 participants consisting of 310 participants from the degree level and 40 from the diploma level (male; 94, female; 256) from the Faculty of Health Science in UiTM Puncak Alam, Selangor. The participants that experience LBP were 60.6%, while 39.4% were non-low back pain (NLBP). The demographic characteristics of participants are illustrated in Table 1.

Table 1. The demographic characteristics of participants

Characteristics	n (%)	Mean±SD
Age		
19-24		22.17±1.36
BMI (kg/m²)		
<18.5	62 (17.71)	
18.5-24.9	193 (55.14)	22.72±4.52
>25.0	95 (27.14)	
Educational level		
Degree	310 (88.6)	5.29±1.86
Diploma	40 (11.4)	
Ethnicity		
Bajau	1 (0.3)	
Iban	5 (1.4)	1.12±0.63
Kadazandusun	14 (4.0)	
Malay	330 (94.3)	
Gender		
Female	256 (73.1)	
Male	94 (26.9)	
Height		159.49±12.43
Weight		58.32±15.01
LBP status		
LBP <6 weeks	141 (40.3)	
LBP 6-12 weeks	46 (13.1)	0.61±0.49
LBP >12 weeks	25 (7.1)	
Non-LBP (NLBP)	138 (39.5)	

4.2 The comparison of QOL between LBP and NLBP

As shown in Table 2, there are significant differences in the mean scores of PCS and MCS scores between students with LBP and NLBP. The mean scores of PCS and MCS were significantly lower in students with LBP than NLBP. For PCS, LBP and NLBP students scored 48.80±7.68 and 54.82±3.28, respectively. Meanwhile, MCS scores for LBP and NLBP students were 41.52±10.2 and 49.09±6.78, respectively. Both PCS and MCS showed significant differences between LBP and NLBP (p<0.001).

Table 2. The comparison of QOL between LBP and NLBP

Variables	LBP (n=212) mean±SD	NLBP (n=138) mean±SD	Mean difference (95% CI)	t-stats (df)	p-value
PCS	48.80±7.68	54.82±3.28	-6.02 (-7.33, -4.71)	-9.07 (378)	<0.001
MCS	41.52±10.2	49.09±6.78	-7.57 (-9.43, -5.71)	-8.00 (378)	<0.001

4.3 The association between QOL and pain intensity

There is no association between QOL and pain intensity among students with LBP (Table 3)

Table 3. The association between QOL and pain intensity among students with LBP

Variables	n (%)	X ² (df)		p-value	
		PCS	MCS	PCS	MCS
Pain intensity					
No pain	10 (4.72)				
Mild pain	116 (54.72)	754.279	751.326	0.331	0.359
Moderate pain	78 (36.8)				
Severe pain	8 (3.76)				

5.0 Discussion

Most of the participants in our study aged between 19-24 years old experienced LBP, and females who reported LBP is higher than male students. It might be due to most of the participants who volunteered for this study being females. The QOL of the students with LBP was lower when compared to students with NLBP. The QOL seems to be lower in women than men, as the prevalence of LBP is higher and significantly inclined with increased age (Husky et al., 2018; Hadziomerovic et al., 2017). However, both genders have a similar point prevalence of LBP, and females were to have a lower point prevalence (Vudcic et al., 2018). A combination of biological, psychological, and social factors are the contributing factors that lead to different numbers of prevalence in gender.

Nevertheless, there is no detailed explanation regarding QOL in students with LBP and NLBP concerning weight, height, race or ethnicity, social status, sports activities, and daily living activities (Vujcic et al., 2018). This is possible due to different types of settings, physical work, and psychological distress depending on where the study was conducted. The level of physical demands and surroundings of the population may affect the incidence of LBP. For example, white-collar workers have been shown to have a lower incidence of LBP compared to manual workers and unemployed people (Alarab & Narin, 2018). This could be due to higher demands of physical work and stress among manual workers than those who work in the office setting. Besides, the nature of the work also plays an essential role in LBP. The students who have to sit for a prolonged duration attending online classes will have increased pressure in their spine and develop

LBP. Furthermore, stress during lectures and increased loads for assignments will further increase their pain intensity. Thus, this study demonstrated a high prevalence of LBP among the students.

This study shows that both physical and mental components of QOL are lower in students who experience LBP when compared to students with NLBP. The results of our study are consistent with Panahi et al. (2016), which stated that university students who experience LBP have lower QOL in all aspects when compared to students without pain. This explained that high demands of the curriculum during the studies cause students to have a sedentary lifestyle, improper postural habits, and exposure to stress leading to an increased risk of high LBP prevalence among the populations. This situation then contributes to the reduction in QOL among student population associate activities that trigger LBP for instance, restrictions or limitations on playing in sports and house cleaning (Vujcic et al., 2018). Moreover, there is a significant decrease in QOL of students with pain associated with LBP compared to those without LBP. On top of that, all aspects of QOL including physical, psychological, and social can be reduced among students associated with LBP (Panahi et al., 2016). Thus, the physical health and mental components are both affected in students with LBP.

The association between the intensity of pain with QOL of students who experience LBP was examined in this study. Another factor that can lead to the reduction of QOL among the population with LBP is pain intensity. Activities such as chores and sports may trigger pain associated with LBP that will lead to a limitation of their participation in everyday life. When they experience pain with their daily physical activity will lead to limitations doing certain physical activities that may cause a decrease in the QOL. On top of that, management of pain, pain intensity, nature of pain, and improvement in the degree of pain are closely related to treatment efficacy in LBP and for planning management approach (Choi et al., 2014).

This study shows that the association of pain intensity measured using the NRS pain scale with the QOL of the students who experience LBP has not been statistically significant with $p > 0.05$. The most common pain intensity in students with LBP was 'Mild pain', followed by 'Moderate pain', 'No pain', and 'Severe pain'. The result of this study was inconsistent with Nasution et al. (2018) and Guclu et al. (2012). The study by Nasution et al. (2018) included 29 participants from outpatients in the Neurology Clinic at Adam Malik General Hospital Medan. The intensity of pain was assessed in the interview by using the Short-Form McGill Pain Questionnaire (SF- 911 MPQ). This questionnaire includes the Present Pain Intensity (PPI) index of standard MPQ and visual analog scale (VAS). Besides, they measure QOL by using Short Form-36 (SF-36) health survey. Their study found that almost all of the elements in the SF-36 questionnaire were considered to provide significant results except for mental health components ($p = 0.110$, $r = -0.235$). Another study that uses the VAS pain scale and SF-36 shows that there are significant results in physical function ($p < 0.01$, $r = -0.477$) and mental health ($p = 0.002$, $r = -0.305$) with the intensity of the pain (Guclu et al., 2012). The NRS pain scale is more sensitive and easier to administer verbally when compared to VAS. Moreover, the VAS pain scale has more practical difficulties when compared to NRS (Karcioglu et al., 2018). NRS pain scale can be administered in written or verbal form, however, it is unsuitable for the elderly or young population (children) as the pain scale does not differentiate between words and numbers. The difference in the result of our study compared to the other two studies may be due to the larger sample size available in our study compared to other studies. It may influence the results for the interpretations of the intensity of pain between the participants as it varies with different individuals.

However, most of the studies did not include classification of the pain intensity in their study of QOL among the LBP group with the pain intensity. Therefore, this is the first study that identified the classification of pain intensity among university students with LBP. This study has revealed that more than half of the students with LBP have mild pain intensity.

This study has its limitation which includes limited participants that only recruited the students from the Faculty of Health Science of UiTM Puncak Alam, thus the results could not represent the total student population of UiTM in Malaysia.

6.0 Conclusion & Recommendations

In conclusion, this study suggests a high prevalence of LBP among the students from the Faculty of Health Science. The presence of LBP with high pain intensity among university students might reduce their QOL. Additionally, this study contributes to a better understanding of the prevalence of LBP, intensity of pain, and QOL among university students. Further research needs to explore a more comprehensive understanding of the relationship between the intensity of pain and QOL. Besides, preventive measures such as pain education and engaging in active lifestyles and activities among the students should be promoted to minimize the occurrence of LBP among the population.

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Paper Contribution to Related Field of Study

Physiotherapy, Public Health, Health and wellbeing

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