

# THE INCIDENCE OF LOW BACK PAIN AMONG UNIVERSITY STUDENTS

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## Abstrak

*Salah satu kebiasaan paling umum di kalangan mahasiswa adalah duduk dalam waktu lama. Duduk lama telah diidentifikasi sebagai salah satu faktor yang menyebabkan nyeri punggung bawah (NPB) di kalangan siswa di universitas. Oleh karena itu, sejumlah besar mahasiswa dapat mengalami NPB karena menghabiskan terlalu banyak waktu dalam duduk untuk membaca atau bekerja di komputer. Penelitian ini bertujuan untuk menyelidiki prevalensi LBP di kalangan mahasiswa. Studi cross-sectional ini dilakukan di kalangan mahasiswa dalam empat minggu. Informasi mengenai NPB dikumpulkan dengan menggunakan kuesioner NPB sederhana yang dibuat dengan formulir daring. Kuesioner terdiri dari pertanyaan pada data sosio demografi, tahun studi, aktivitas duduk yang lama dan riwayat NPB. Perangkat lunak Statistical Package for the Social Sciences (SPSS) versi 20 digunakan untuk menganalisis data yang dikumpulkan. Seratus dua puluh dua mahasiswa berpartisipasi dalam penelitian ini. Prevalensi keseluruhan NPB di kalangan mahasiswa adalah 74,6%. Siswa dengan lama duduk lebih dari 3 jam dalam sehari dilaporkan mengalami NPB dengan 79% sementara 63,9% siswa dengan lama duduk kurang dari 3 jam dalam sehari juga mengalami NPB. Adanya insiden NPB yang tinggi pada mahasiswa dengan waktu duduk lebih lama maupun kurang dari tiga jam dalam sehari.*

**Kata kunci :** *duduk lama, mahasiswa, NPB*

## INTRODUCTION

Students usually attended the classroom session for the theories input and at the same time working in front of computer to browse through for resources, which involved prolonged sitting in most of their daily activities. The study by Voon et al. (2013) have shown, the total of about 64.7% students, who spent at least 90 minutes, sitting while attending the classroom theory session, and students sitting with working on computers for 45 minutes, 60 minutes and 90 minutes or more in a day were reported respectively by 10%, 18.4 % and

61.6 %. While other study by Nordin, Devinder, and Kanglun (2014) also revealed similar results, with which 31% of students usually sat in the classroom or working in front of the computers everyday between 6 to 8 hours. The sitting activity at least 2 hour in a day defined as a prolonged sitting and led to increased body discomfort (Waongenngarm et al., 2016). Several other studies have had concluded that students have a habits with sitting for too long remain on a prolonged uncomfortable posture have developed with high static muscle load (Casas et al.,

2016; Voon et al., 2013 ; Mozafari et al., 2015). Prolonged sitting become one of the factors causing musculoskeletal pain specifically the university student who suffered from having LBP (LBP), which commonly reported (Issa et al., 2016; Patil et al. 2016; Nordin et al.2014).

Initially the most common affected anatomical areas among people with prolonged sitting activity that were found to be high with musculoskeletal pain were the shoulders and low back, which significantly associated between individual factors, work ergonomics due to inappropriate posture and movements. Kaliniene et al. (2016) shared their finding by indicating that the work-related psychosocial factors have had a significant impact on experiencing pain as well with high quantitative demands, which was associated with musculoskeletal complaints in most of the anatomical areas, and weak social support was a significant predictor for musculoskeletal complaints in the upper and low back areas. Postural pain syndrome refers to the pain that results from mechanical stress when a person maintains a faulty posture for a prolonged period; the pain is usually relieved with activity. There are no impairments in functional strength or flexibility, but if the faulty posture continues, strength and

flexibility imbalances eventually develop (Kisner and Colby, 2012).

A study in Saudi Arabia, also reported that students with prolonged sitting more than 3 hours in a day have incidence of LBP with prevalence 61.5%, while the other students that sitting less than 3 hour in a day also found to have LBP with prevalence 38.5%. In their study, total student that have LBP was found 30% of the prevalence (Issa et al., 2016). Arsh and Jan also reported similar result with 57.8% of student spending time with sitting more than 3 hours in a day had LBP and 26.7% student with prolonged sitting less than 3 hours also had LBP. Whereas, a study at Mumbai, India, shown 352 per 1000 students of physiotherapy suffered from mechanical LBP. Majority of these students suffered from mild disability and the most affected activity was unable to stand (Patil et al. 2016). A study done by Nordin Devinder and Kanglun (2014) on the health sciences undergraduate students have demonstrated approximately 80% of younger population experience LBP due to their physical fitness and sitting for too long.

Most of studies reported that LBP was affected in every years of study. Issa et al. (2016) revealed that students in fourth year were the most higher

incidence of LBP with prevalence 37.2 %, despite there were also reported in first year, second year, and third years student have LBP experience with prevalence 13.2%, 27.8% and 31.1% respectively. Similar study from Australia, reported that fourth year and second year have incidence of LBP with prevalence 81.7% and 72.4% (Nylad and Grimmer, 2003). However, the first year's student and third year's student also showed higher incidence with prevalence more than 50% of the population. Arsh and Jan (2016), also revealed that the forth and third years study showed higher incidence of LBP with more than 50% of the prevalence in each years of study population. Nordin Devinder and Kanglun (2014) concluded their study that not only years of study, but also age, physical fitness and prolonged sitting were associated with incidence of LBP. The university student age were commonly ranged between 19-25 years old, with the age mean  $20.9 \pm 1.3$  years old and  $21.47 \pm 1.36$  (Issa et al, 2016 ; Nordin, Devinder, and Kanglun, 2014). Younger student also reported have incidence of LBP, which are 20 and 21 years old compare with 18 years old students (Nylad and Grimmer, 2003).

From all the above studies, reported students are at risk to develop LBP,

which has been proven in some researches with having negative impact to their activities in the university. Non-specific LBP has also increased in general communities, which have affected the adolescents and middle-aged people and have a major impact to functional and educational activities, which is related to university population (Aziz, et al., 2016). A study by Casas et al. (2016), found that the prevalence of limitation for academic activities was almost 30% and which affected students, on their daily life activities and causing potential effect on students quality of life. In their study also revealed that some student with LBP reported inability to perform academic activities, which is the bad impact the LBP. Prolonged severe LBP will also affect the quality of life of the university student population. The impact of LBP on quality of life can be due to the severity of pain (Montgomery et al., 2016). Student might take a day off if they have severe LBP for medical check-ups, (Ramdan et al., 2014). A systematic review research discovered that 32% of the office workers were absent from work because of LBP and would be on long-term medical leave until recovered, that can be related with student, which can be one of factor of absenteeism (Wynne-Jones et al., 2013).

Consequently, it is known that the LBP consists of two types, which is specific and non-specific LBP. Specific back pain can be divided into LBP that related with vertebrae and non-vertebrae, but non-specific LBP developed from the soft tissue, which is poorly localized (Husein et al., 2009). In addition, non-specific LBP is classified into LBP, which is not related to the neurological problem and degenerative syndrome (Taguchi, 2003). Some anatomical related factors can be contributed to the incidence of LBP. Prolonged sitting led to increased body discomfort in the neck, shoulder, upper back, low back, and buttock while prolonged slumped sitting may be related to Internal Oblique or Transverse Abdominis muscle fatigue, which d compromise the stability of the spine, making it vulnerable to injury (Waongenngarm et al., 2016). LBP may develop by some factors that increased lumbar lordosis, reduced abdominal muscle length and strength, together with decreased back extensor muscle endurance, back extensor muscle flexibility, length of iliopsoas muscles, hamstring muscle flexibility, body composition and others (Koley et al., and Koley et al., 2010). This present study objective is to determine the incidence of LBP among university student and its

risk factors, while there is a lack of study about the prevalence of LBP among university students.

## **METHODOLOGY**

This study is a cross-sectional survey was conducted among health science undergraduates' students at KPJ Healthcare University College (KPJUC). Ethical approval granted by the university's Research Ethics Committee. Participants were recruited from five program in KPJUC, those are physiotherapy, nursing, pharmacy or pharmaceutical, medical imaging and health information management program with the use of simplified and adapted questionnaire of LBP from previous study with simple answer "yes" or "no" (Nyland and Grimmer, 2003).

The questionnaire was organized into three parts; part one consisted of socio-demographic information, part two collected details of years of study and prolonged sitting activity more than 3 hours in a day and part three of incidence of LBP since studying at the university. The questionnaire was pre-tested on 10 students before distributing to the subjects to ensure that the questionnaire was easily understood. The questionnaire created through online forms and distributed by the researchers. The web

link of the questionnaire was distributed among the students, of all academic years, through their batch by chat application or email with the cover letter. The cover letter informed the participants of the purpose of the study, the assurance of anonymity and the entitlement of the respondents to complete or decline the survey questionnaire. The questionnaire was distributed within one month in August 2017.

Students were included in this study if they have prolonged sitting activity more than 3 hour in a day, while students with minimum prolonged sitting less than 3 hour in a day also included in which to know about the incidence of LBP. Participants were excluded if they had any known spinal deformities such as scoliosis, spondylolisthesis, spondylosis, spondylolysis, spinal stenosis, prolapsed intervertebral disc and any neurological deficits, and history of LBP 6 months prior to enrollment in this study that required medical management and have other medical illness. A total of 122 subject answered the questionnaire. Verbal explanation of the study was provided prior to distribution of the questionnaire. Informed consent was inferred by voluntary completion and return of the questionnaire. Statistical analysis of the data was performed using SPSS software

version 20. Descriptive statistics were used to summaries the participants' demographic information and the incidence of LBP.

## **RESULT**

One hundred twenty two students responded to the survey and their demographic data is as reported in Table 1. The mean  $\pm$  standard deviation age of the participants was  $20.39 \pm 1.77$  years. Majority of the participants were females (85.2%) and third year's students (40.2%). Eighty-six participants have prolonged sitting more than 3 hours day and another thirty-six participants were sitting less than 3 hour in a day.

The results of the incidence of LBP and risk factors are as shown in Table 2. Participants that experienced LBP were 74.6% while another 25.4% not experienced LBP. Higher incidence of LBP was observed in male participant (77.8), 18-20 years old (79.1), prolonged sitting more than 3 hour in a day (79%). All subjects in every year of study have experienced of LBP while lower LBP incidence (72.2%) was reported among students in second year of study. The higher incidences of LBP were in first year's students with prevalence 81.1%.

**Table 1.** Socio-demographic of the subjects

Characteristic		N(%) or Mean (SD)
Age		20.39 (1.77)
Gender	Male	18 (14.8)
	Female	104 (85.2)
Years of study	Year 1	11 (9)
	Year 2	36 (29.5)
	Year 3	49 (40.2)
	Year 4	26 (21.3)
Prolonged sitting >3 hours/day	Yes	86 (70.5)
	No	36 (29.5)

**Table 2.** LBP incidence among university students

Characteristic		Experience LBP	
		Yes N (%)	No N (%)
All subjects		91 (74.6)	31 (25.4)
Gender	Male	14 (77.8)	4 (22.2)
	Female	77 (74)	27(26)
Age (group)	18-20	53 (79.1)	14 (20.9)
	21-23	31 (68.9)	14 (31.1)
	≥24	7 (70)	3 (30)
Prolonged sitting >3 hour/day	Yes	68 (79)	18 (20.9)
	No	23 (63.9)	13 (36.1)
Years of study	Year 1	9 (81.1)	2 (18.2)
	Year 2	26 (72.2)	10 (27.8)
	Year 3	36 (73.5)	13 (26.5)
	Year 4	20 (76.9)	6 (23.1)

**DISCUSSION**

The objective of this study was to determine the incidence of LBP among university students. This study provides evidence that there is a higher incidence of LBP among university student. The questionnaire in this study also determines the risk factors of LBP among university student.

The result of this study revealed that there is a higher incidence of LBP with 74.6%, which is more than half of

the population. A study by Yucel and Torun (2016) also supported the finding in this present study. They also found there is a higher incidence of LBP in Health University with 90.57%. In their study, also revealed that the population was in Health University that consisted of health science program, which is similar with this present study. However, some studies have contradicted result with the present study. A study by Nordin, Devinder, and Kanglun (2014) reported

that only 40.3% of students in health sciences undergraduate student experienced LBP. The total numbers of students with LBP in this previous study still consider high number. Casas et al. (2016) also reported that only 47.9% in last four weeks during the study conducted. However, they also reported that the greater chronic pain, which is in last 12 weeks, was in the lumbar region with 45% of the population. The students in this previous study are is mainly health science or medical student. Similar result from a study reported that 46.1% of incidence of LBP experienced among medical student in a Malaysian Medical College (Alshgga et al.,2013). However, the result of LBP prevalence was the higher among other musculoskeletal pain that they observed, such as, neck pain (41.8%) and shoulder pain (22.8). Despite the prevalence was not more than the half of population, this previous study result still can be concluded with the present study result. A study in Saudi Arabia among undergraduate student also reported only 30% of the prevalence experienced LBP, however in their study, the population was only male student were female students were not included (Issa et al., 2016). The total number of this previous study was 872 participants with the number of student with LBP

were 262 students. From all of study above, LBP still identified as a higher incidence in university students, despite some studies were not supported the present study findings.

The finding of this present study also revealed that males had more incidence of LBP despite the number of males was lower than females. In comparing the number between both genders, female found to be the most incidence of LBP. However, both gender showed have a higher incidence of LBP with more than 70% of the prevalence. The similar result also supported by a study in Turkey, that more than 80% in both gender experienced LBP among medical and health sciences university student (Yucel and Torun, 2016). This previous study also revealed that female participant was the most had incidence of LBP with 91.3%. A study in a Malaysian medical college reported that both, male and female reported had a musculoskeletal pain with more than 60% of the prevalence in both gender in past 12 months. They also reported that male participant were the most incidence of musculoskeletal pain with prevalence 68.6% while for female was 63% of the population. However, in their study, they were not specified the areas of musculoskeletal pain despite the most

common reported musculoskeletal pain was LBP. As a resume, all previous studies reported that both gender have high incidence of LBP among university student.

From the result of the present study, the age between 18-20 years old was found to be the higher incidence of LBP among other age group. However, all of age group still found to be higher incidence of LBP. A study by Issa et al. (2016) also supported this present study finding that the age range between 19-22 years old was found to be the higher prevalence (72.1%) among university students. Nordin, Devinder, and Kanglun (2014), revealed that the higher incidence of LBP among health sciences student was in the student that more than 23 years old. This previous study also supported that the result in the present study showed the age group with more than 24 years old was the second higher incidence of LBP despite the most age group that affected LBP is 19-22 years old. Nylad and Grimmer (2003), revealed that student aged 20 and 21 were more at risk of LBP which is supported this present study findings. However, their study only using physiotherapy student as their subjects. Thus, the result from those previous studies still supported the present study finding.

The incidence of LBP in this present study were reported among the students with or without prolonged sitting. However, the most prevalence of LBP incidence was in students with prolonged sitting more than 3 hours in a day (79%). A study by Arsh and Jan (2015), reported that 57.8% of student which spending time more than 3 hours in a day to prolonged sitting have experienced LBP while 26.7% student with prolonged sitting less than three hours in a day also experienced LBP. This previous study finding were similar and supported this present study finding that more than or less than three hours of prolonged sitting also affected to LBP despite the study only using students from Doctor of Physiotherapy program. Similarly, a study by Nordin, Devinder, and Kanglun (2014) also reported that the students with less than 4 hours in a day experienced LBP (24%) and student with sitting more than 4 hours in a day have higher incidence of LBP with 61.3% of the prevalence. Despite the time boundary was different, this previous study also supported the present study findings. This can be notice, from all of previous studies, resulted that student with prolonged sitting more or less than 3 hours in a day also had a risk of LBP.



This present study also revealed that the first year student (81.1%) have higher incidence of LBP than second, third and fourth year's student. However, the numbers of student in first year were the fewest among all year of study. The second higher incidence of LBP in this study was fourth year's student with 76.9%. Arsh and Jan (2015) also reported similar result from their study. The incidence of LBP in fourth years student of doctor of physiotherapy program was 53% which is higher than other years of study. Despite, the first years student reported only 23% experienced LBP, this previous study supported the present study result in LBP in fourth years student. A study among physiotherapy student in Australia also revealed that first year student had LBP with 57.5%, second year with 72.4%, third year 67.7 % while in fourth years student was the higher with 81.7% in lifetime of study. They also reported that the incidence of LBP among students found increased in every years of study. In a week reported that the prevalence of LBP incidence was 15% in first year and more than 30% in second, third and fourth year of study. In a month, also reported the prevalence of LBP was 31.3% in first year's student, 50% in second year, 41.2% in third year and 56.7% in fourth year. In 12 month,

they reported the LBP incidence were 51.3% in first year, 65.8% in second year, 61.8 in third years and lastly in fourth year's student were 76.7%. This previous study can be related with the present study findings that all years of study were affected to incidence of LBP (Nyland and Grimmer, 2003). Issa et al. (2016) also reported that the higher incidence of LBP was in fourth year's student with prevalence 37.2 %. In their report, all years of study also reported had incidence of LBP. Nordin, Devinder, and Kanglun (2014) reported similar result that fourth year's student have higher incidence of LBP (61.5) among other years of study, despite in first, second and third year's student also have incidence of LBP with more than 30% in the prevalence. As a resume, from all of previous study, students have a risk of LBP in every years of study, which supported this present study finding. Limitation in this present study was students who participated have their own activity besides their activity in university that might be one of causes of incidence of LBP.

## CONCLUSION

There is a higher incidence of LBP among university students. Both genders have similar possibility to have LBP

incidence. Student with prolonged sitting more or less than 3 hours in a day also affected with LBP incidence, while every years of study also have similar risk of LBP incidence.

## RECOMMENDATION

We recommended to university to increase the awareness of LBP incidence among students. University also recommended to making some preventive steps using information board about the self-management of LBP and providing a physiotherapy clinic for students to get advance treatment of LBP. Since, the questionnaire in this study was very

simple, hence future study recommended to use more detail questions about the incidence of LBP. Since the analysis in this study was simple analysis, further study need to use advance analysis in association of the LBP contributing factors.

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