UNIVERSITI PUTRA MALAYSIA

ASSOCIATION BETWEEN SCHOOLBAG WEIGHT AND BACK PAIN AMONG PRIMARY SCHOOLCHILDREN IN KAJANG, SELANGOR.

SHURUL AZWA SHUHAIMI

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ABSTRACT

ASSOCIATION BETWEEN SCHOOLBAG WEIGHT AND BACK PAIN AMONG PRIMARY SCHOOLCHILDREN IN KAJANG, SELANGOR.

SHURUL AZWA SHUHAIMI

Introduction: These days, there is a growing concern that schoolchildren are carrying too heavy schoolbag on their backs. A cross sectional study was conducted on 81 schoolchildren from two different types of primary school in Kajang, Selangor. **Objective:** To determine the association between schoolbag weight and back pain among primary schoolchildren in Kajang, Selangor. **Method:** Respondents' body weight and their schoolbag weight were measured using the electronic body composition OMRON and KERN weighing scale respectively, while the height was measured using Body Meter Seca 208cm. Back pain in the past one week was assessed using a questionnaire, adapted from previous studies. **Results and Discussion:** There were 74.1% of schoolchildren had the schoolbag weight more than 10% of their body weight. There were also 32.1% of schoolchildren reported having back pain and 21.0% of them were female respondents. Back pain were detected in 24.7% government schoolchildren and 7.4% private schoolchildren. The chi-square test was used to analyse the association in this study. There were significant association between back pain and; relative weight (x^2=9.720, p=0.002) and types of school (x^2=4.949, p=0.026). **Conclusion:** Schoolchildren that carry schoolbag more than 10% of body weight like generally recommended, will be experienced the back pain. In order to reduce this problem, the locker should be prepared so that schoolchildren may keep their things in there rather than carry them to school in daily basis.

Keywords: Primary schoolchildren, schoolbag weight, back pain, association

ABSTRAK

HUBUNGKAIT ANTARA BERAT BEG SEKOLAH DAN SAKIT BELAKANG DALAM KALANGAN KANAK-KANAK SEKOLAH RENDAH DI KAJANG, SELANGOR

SHURUL AZWA SHUHAIMI

Pengenalan: Pada hari ini, terdapat kebimbangan yang semakin meningkat berkenaan kanak-kanak sekolah membawa beg sekolah yang terlalu berat. Kajian keratan rentas dijalankan ke atas 81 kanak-kanak sekolah daripada dua jenis sekolah rendah di Kajang, Selangor. **Objektif**: Tujuan kajian ini adalah untuk menentukan hubungan antara berat beg sekolah dan sakit belakang dalam kalangan pelajar sekolah rendah di Kajang, Selangor. **Metodologi:** Berat badan responden dan berat beg sekolah mereka, masing-masing diukur dengan menggunakan alat penimbang elektronik OMRON dan KERN, manakala ketinggian diukur menggunakan "Body Meter Seca 208cm". Sakit belakang pada satu minggu yang lalu dinilai dengan menggunakan borang soal selidik yang diubahsuai daripada kajian terdahulu. **Keputusan dan Perbincangan**: Sebanyak 74.1% kanak-kanak sekolah mempunyai berat beg sekolah lebih 10% daripada berat badan mereka. Sebanyak 32.1% kanak-kanak sekolah melaporkan bahawa mereka mengalami sakit belakang dan 21.0% daripadanya adalah responden wanita. Sakit belakang dikesan dalam 24.7% kanak-kanak sekolah kerajaan dan 7.4% kanak-kanak sekolah swasta. Ujian chi-square digunakan untuk menganalisis hubungkait dalam kajian ini. Terdapat hubungan yang ketara antara sakit belakang dan; berat relatif ($x2 = 9.720$, $p = 0.002$) dan jenis sekolah ($x2 = 4.949$, $p = 0.026$). **Kesimpulan:** Kanak-kanak sekolah yang membawa beg sekolah lebih 10% daripada berat badan seperti yang disyorkan secara umum, akan mengalami sakit belakang. Untuk mengurangkan masalah ini, loker harus disediakan supaya murid sekolah boleh menyimpan barangan mereka di situ berbanding membawanya ke sekolah setiap hari.

Kata kunci: Kanak-kanak sekolah rendah, berat sekolah, sakit belakang, hubungkait

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<	Less than
≥	Equal to or more than
%	Percent
cm	Centimetres
kg	Kilograms
N	Number of populations
BMI	Body Mass Index

CHAPTER 1

INTRODUCTION

1.1 Background

All children with school-age of 6 - 18 years old attend school, except on weekends and public holidays (Azuan et al., 2010). Primary school children are at a maturity age and it is important that they do not carry superfluous loads. They usually carries their school bag to, from and around the school. The school bag contains of their textbooks, packed meals, water bottles, sport attires and stationaries (Kabilmirhabi and Santhirasegaram, 2017). School bag as defined in Cambridge Dictionary (2017), is a bag that is used for carrying books and other things for school, usually with a long strap and carried over the shoulder, or carried on the back like a backpack. Heavy school bags can change the body posture and the musculoskeletal system must react appropriately in order to satisfy for this stress (Saleem et al., 2016).

Global studies have noted association of school bag weight and back pain among primary school children (Saleem et al., 2016; Nor Azlin et al., 2010). A study conducted in Al-Ahsa, Saudi Arabia reported that the students were suffering the back pain related to the use of heavy school bag (Saleem et al., 2016). In Southern Brazil, a study conducted by Fonseca et al. (2016), stated that the usage of

overweight backpacks and carrying these in a different manner, sitting for long periods of time with poor pose, use of anatomically incorrect furniture, watching television for long periods of time, sleeping less than seven hours a day, smoking, obesity and psychological factors such as depression and anxiety are some of the risk factors for onset of back pain in students. In addition, children also experienced pain in the upper body involving the neck, shoulders and upper back. Pain in these areas is associated with carrying heavy loads (Mwaka et al., 2014). In Malaysia, study by Tamrin et al. (2005), found that the children have low back pain associated with carrying heavy school bags. They also found that the risk factors for the development of back pain among the primary school children were the school bag weight and method of carrying school bag. The schoolbag issues had been arrived in 2010 and became a controversial in Malaysia as shown in Figure 1.1.

Most guidelines from a few state and countries recommend that school bags should be not more than 10% of the students' weight (Nor Azlin et al., 2010). Kabilmirhabi and Santhirasegaram (2017), stated that 10% of body weight has been commonly accepted as a recommended schoolbag weight for primary school children as the physical capability of them are differ from adults.

28 - Berita Harian - Tuesday, May 4, 2010

Isu lapuk beg sekolah berat belum selesai

12 - Utusan Malaysia - Thursday, April 29, 2010

Sekitar 40 peratus murid bawa beban lebih 20 peratus - CAP

Ringankan segera beg sekolah

N15 - Sinar Harian - Wednesday, March 24, 2010

Kesan beg sekolah berat pada murid

Figure 1.1 : Paper cutting about the schoolbag weight issues

Sources: Berita Harian, Sinar Harian, Utusan Malaysia, 2010

1.2 Problem Statement

A study has shown that the prevalence of low back pain among children and teenagers varies between 11 % and 52.1 %. The use of a back pack is the most important factor causing low back pain among students (Azhar et al.,2017). Some investigator brainstorm that use of heavy backpacks may contribute to the high reports of back pain among children. Though the overall lifetime prevalence of low back pain in children has been reported as high as 65% (Mwaka et al., 2014).

Heavy school bags are one of universal factors that influence the incidence of musculoskeletal pain among school children (Syazwan et al., 2011). Carrying overweight school bag may result in biochemical stresses imposed on the children's musculoskeletal injuries (Tamrin et al., 2005). The weight of backpack has increased significantly due to the necessity of carrying academic materials (Azhar et al.,2017). A study revealed that the weight of materials carried to and from school has significantly increased as curricula changes and extracurricular activities grow, with students sometimes carrying their school materials, sports equipment or instruments around simultaneously (Cavallo et al., 2002). Many children carrying their bags over just one shoulder or very low in their backs. This greatly increases the risk of pain and injury (Avantika and Shalini, 2013). Backpack weight had the greatest influence on shoulder strap tension and shoulder pressure as the weight of backpack increase the strap tension and shoulder pressure increase as well. When the shoulder strap was loose, the tension and pressure under the shoulder strap decrease (Mackie et al.,2005).

Previous study have analyzed whether there is critical backpack weight to body ratio that if outreached affects health's studies indicate the incidents of backpacks use by school children in the developed countries is at least 90%. The average loads vary greatly between studies the majority of reports point out that the loads carried by students greater than the recommended limits (Avantika and Shalini, 2013). Although the weight limits have been recommended in several states or

countries, controversy continues to exist in the literature about the effects of backpack weight on back pack in children (Mwaka et al.,2014; Afzal et al., 2015).

Despite the recommendations, students, teachers, and parents are often unaware of the weight being carried in the school bags. A study reported that 96% of parents of 188 students who carried schoolbag heavier than the weight generally recommended had never checked their child's school bag weight, and 36% had never checked the school bag content (Nor Azlin et al., 2010). Refractory, in Malaysia, the risk factors of carrying heavy school bag faced by school students are currently a slighted issue as Malaysians are not well exposed on the ergonomics awareness where there are solely few studies and reports done in Malaysia regarding this issue (Kabilmirhabi and Santhirasegaram, 2017).

1.3 Study Justification

Since there have been less study performed locally studying the effects of school bag weight and its link with back pain among primary school children in different school system or type, this study will be able to make a comparison among different school type and also able to provide a better data on the school bag weight in Malaysia. It also helps to better understanding of the effect of school bag weight at risk factor on child health.

The private and government primary schoolchildren were chosen as both of them have different education system. Private school only having their educational class for two hours daily. They focus more on "hafazan" since they were Tahfiz International Academic. Meanwhile, government school had the educational class for four to five hours daily. The schoolbag weight of the children in both of the schools may differ each other. The primary school children aged of 8 and 11 years were chosen in this study as it was an average age for the primary school children and they were from non examination classes.

By conducting this study, it can determine whether there is an association between schoolbag weight and back pain among a population of primary schoolchildren. It also benefits to provide more insight on the effect of heavy school bag. This data may be useful for other studies and for government agencies, school boards, parents and teachers to be more aware on these issues. It might also can added to the information and encourage the ministry to develop plan decrease schoolbag weight and provide recommendations or guidelines related to schoolbag weight.

1.4 Conceptual Framework

As shown in conceptual framework presented in figure 1.2, it can be clearly seen that the child ergonomics can be presented whether in home setting or school setting. In this study, primary school was chosen as the main focusing setting and schoolbag as the main issue. The schoolbag weight will influence back pain. However, type of schoolbag and method of carrying schoolbag also may lead to the same outcome. These were influenced by school factors (private and government school). There were also other factors that can contribute to the back pain such as type of transportation, duration of carrying the schoolbag and physical activities of the schoolchildren. Despite, there were found that all the factors contributed had no association to back pain in this study. Therefore, this study focus more on schoolbag weight, type of schoolbag and carriage method.

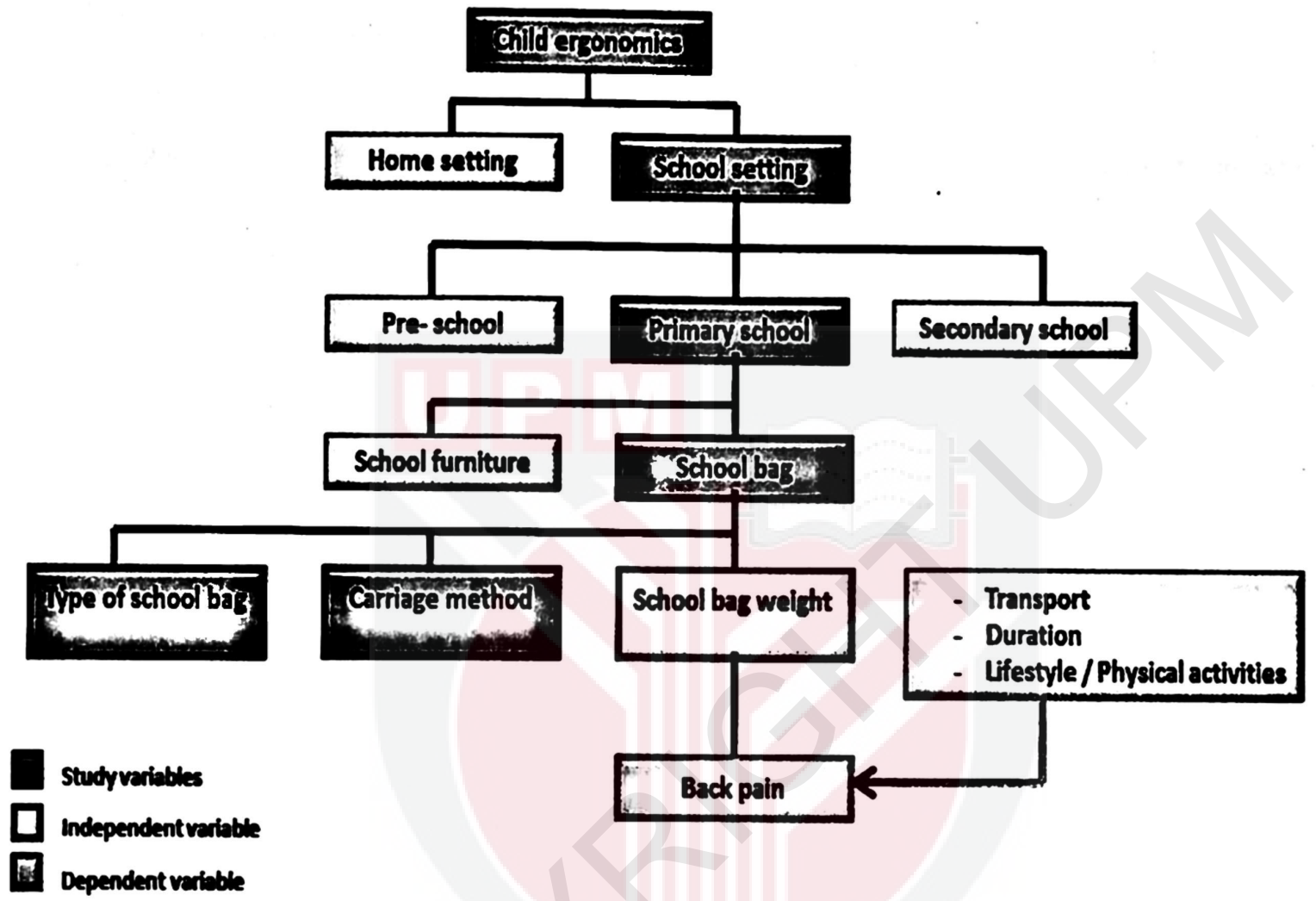


Figure 1.2 : Conceptual framework of schoolbag load carrying modified from Wong, (2015)

1.5 Research Objective

1.5.1 General Objective

To determine the association between school bag weight and back pain among primary school children in Kajang, Selangor.

1.5.2 Specific Objective

1. To determine demographic, background data, school bag weight and school bag information of the selected respondents.
2. To compare the back pain among male and female primary school children.
3. To determine the association between the type of school and back pain among primary school children.
4. To determine the association between the type of schoolbag and back pain among primary school children.
5. To determine the carriage method of school bag and back pain among respondents.
6. To determine the association between Body Mass Index (BMI) and back pain among selected respondents.

1.6 Research Hypothesis

1. There is a significant difference of back pain between male and female primary school children.
2. There is an association between the type of school and back pain among primary school children.
3. There is an association between the type of school bag and back pain among primary school children.
4. There is an association between carriage method of school bag and back pain among respondents.
5. There is an association between the Body Mass Index (BMI) and back pain among primary school children.

1.7 Definition of Term

1.7.1 Conceptual Definition

1.7.1.1 Primary school children

Primary school children are the children between the ages of 7 and 12.

1.7.1.2 Method of carrying school bag

The way students carry the school bag whether by using one arm or back pack method (Nor Azlin et al., 2010).

1.7.1.3 Back pain

Pain felt in the low or upper back. Causes of pain in the low and upper back include conditions affecting the bony spine; discs between the vertebrae; ligaments around the spine and discs; spinal inflammation; spinal cord and nerves; muscles; internal organs of the pelvis, chest, and abdomen; tumors; and the skin (MedicineNet, 2016).

1.7.1.4 Weight

A body's relative mass or the quantity of matter contained by it, giving rise to a downward force; the heaviness of a person or thing (Oxford Dictionary, 2017).

1.7.1.5 Height

The measurement of someone or something from head to foot or from base to top (Oxford Dictionary, 2017).

1.7.1.6 Relative weight

The ratio between the actual school bag weight and the body weight of the respondent calculating the percentage of body weight the children were carrying in their school bag. It is most common method in assessing school bag weight (Dockrell et al.,2013).

1.7.2 Operational Definition

1.7.2.1 Primary school children

Primary school children are the children between the ages of 7 and 12. However, in this study the school children aged 8 and 11 years old was choosen as it were an average age for primary school children.

1.7.2.2 Method of carrying school bag

The method of carrying a school bag is observed in each respondents and given a category based on Table 1.1. The 'others' method of carrying is drawn in the space provided according to the method of carrying observed not found in other categories.

Table 1.1: Method of carrying schoolbag

			
Carry over both shoulder	Carry over one shoulder	Carry with one hand	Pulling with trolley

Sources: Google images

1.7.2.3 Back pain

Existing of back pain is questionnaire based whether respondents answered "yes" or "no" when asked if they were having back pain at the moment.

1.7.2.4 Weight

The measurement of the mass of an individual or an object subjected to gravitational force using the electronic weighing scale Omron with reading taken in kilograms with an accurancy of ±0.1 kg.

1.7.2.5 Height

The measurement of body-height of an individual using a Body meter Seca 208 cm with readings taken in centimetres and with an accurancy of ±0.1 cm.

1.7.2.6 Relative weight

The actual school bag weight divided by body weight of the respondent, multiply by 100.

CHAPTER 2

LITERATURE REVIEW

2.1 Textbooks

MOE has directed primary schools to have a few subjects daily on the timetable so as not to burden the children to carry the textbooks. There are about 10 subjects in the primary school curriculum. Each subject comes with a textbooks, a few workbooks and exercise books. The textbooks can sometimes be thick and heavy. The research that have been conducted by MOE, showed that the total weight of the primary textbooks are between 1.3kg to 5.0kg (Star Malaysia, 2016).

2.2 School bag of children

2.2.1 School bag weight

According to the National Institute of Occupational Safety and Health (NIOSH), there are different weight limit among different countries and the mean carrying weight for boys and girls not more than 16 years old of age are 14 kg and 8 kg. The National Back Pain Association recorded that the school bag weight for British children of 13 years old is 10.4% of their body weight and 10.2% of their

body weight for 16 years old children. Backpacks constitute a significant daily amount of "occupational" load for school children (Negrini et al., 2007). One of the most common symptoms studied in the literature is the back pain in relation to heavy school bags (American Occupational Therapy Association, 2011). Nor Azlin et al., (2010) mentioned that the weight of 10% of body weight has recently reported as the load limit not to cause trunk flexion and perceived exertion among students aged 11-14 years and does not result in posture and gait alterations in school children aged 10 years. Meanwhile, for primary school children, 10% of body weight has been commonly accepted as a recommended school bag weight as the physical capability of school children are different from the adults (Kabilmiharbi and Santhirasegaram, 2013). A similar limit of 10% of body weight is stated in a report from Ireland. It is also recommended in Europe and Health Promotion Board of Singapore (Saleem et al.,2016). The heavier the backpack, the more pressure it exerts on the spinal column and back muscles as the children bend forward in an attempt to support the weight on the back rather than on their shoulders hence development of neck and back pain (Puck Ree et al., 2004).

In Malaysia, a recent study conducted by Fazrolrozi and Rambely (2008) reported that more than 90% of the first year students (mean age 6.5 years) and more than 70% of the second year students (mean age 7.5 years) carried backpack loads of greater than 15% of their body weight to school nearly everyday. In another study carried out by Tamrin et al. (2005) stated that the average load carried by both

primary 2 and primary 5 was 15% of their body weights. Spiteri et al. (2017), shows that there is an increased risk of developing back pain with every 1% increase in bag weight to body weight ratio. Mwaka et al. (2014) showed that the mean school bag weight as a percentage of body weight was 8.5% however about 30.8% of the children had bags which were more than the recommended limit of 10% with the urban school children carrying heavier bags.

2.2.2 Method of carrying school bag

School children are responsible on carrying their own school bag and so it is important for each students to carry their school bag properly in order to avoid or minimize postural problems, back pain and musculoskeletal disorder. There are proper ways on carrying a load and this is also applied on carrying a luggage or a bag. Carrying a load in a lateral position, such as carrying suitcase by hand, requires a greater musculor effort in the contralateral muscles compared to carriage in a backpack where it requires less muscular effort in the lower back (Kabilmiharbi and Santhirasegaram, 2013).

The way students carry school bag contribute to the development of negative effects in the spine. Back pack with two straps is the most common design and thought to be ergonomically-friendly, however most students use only one strap and

suspend their bag over one shoulder. Carrying school bag using one arm has been reported to be most inefficient method, as it consumes energy twice than that of the back pack method (Nor Azlin et al., 2010; Noll et al., 2016; Yoon et al., 2014). One strapped and hand-held bags may cause stress and strain on the back muscles due to an imbalanced load distribution between the shoulders. Roller bags also contribute to low back pain due to improper posture changes during their use. Carrying a backpack on one shoulder instead of both shoulders also increases the risk of low back pain due to postural deviation (Azhar et al., 2017). Children who use one strap bags (which put weight on one shoulder only) have particular problems. These bags cause sideways deviation of the spine (scoliosis) because of the asymmetric weight distribution and this can cause long lasting back aches and damage (Zamzarina, 2008).

Tamrin et al (2005) stated that 84.5% of the subjects carried their school bag over both their shoulders, while 15.5% of them used other methods of carrying including over one shoulder, in one hand or pulling with trolleys. While study conducted by Azhar et al (2017) reported that eighty-seven percent of the subjects carried a two-strapped bag using both shoulders. More female students (10.9%) favoured one strapped bags than males (2.0%).

2.3 Human physiology and anatomy

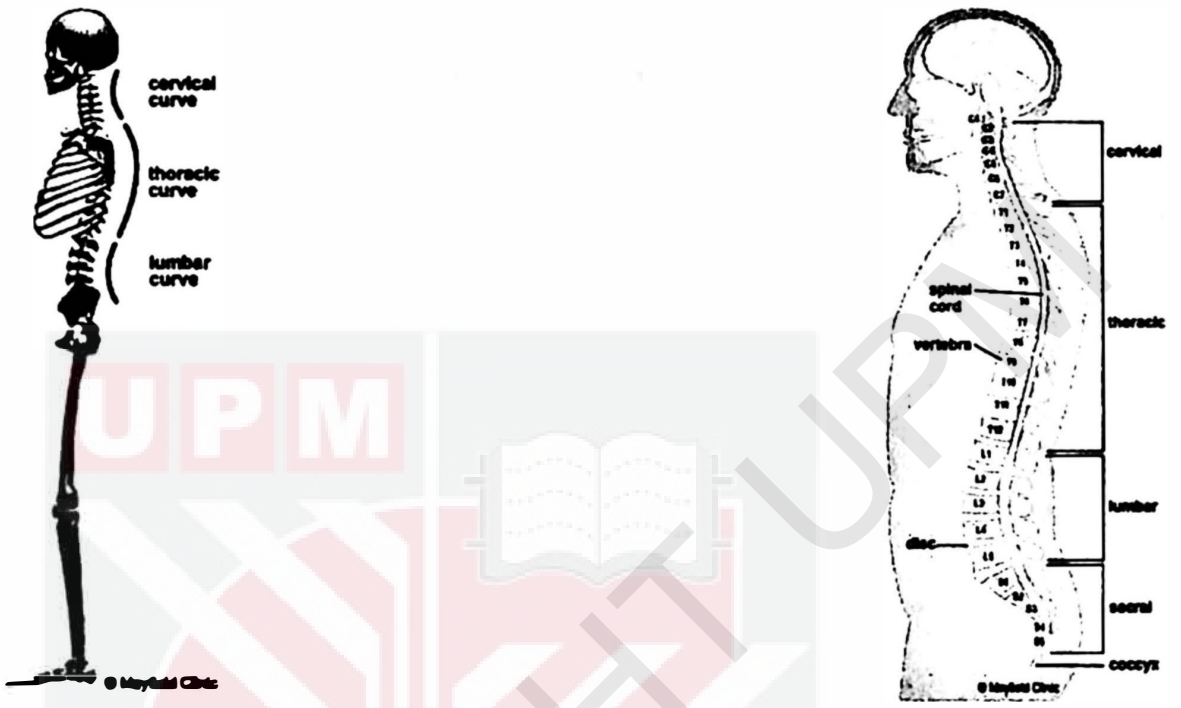
2.3.1 The spine in skeletal system

The spine is made of 33 individual bones stacked one on top of the other. This spinal column provides the main support for your body, allowing you to stand upright, bend, and twist, while protecting the spinal cord from injury. Strong muscles and bones, flexible tendons and ligaments, and sensitive nerves contribute to a healthy spine. Yet, any of these structures affected by strain, injury, or disease can cause pain.

Figure 2.1: The carrying of two straped schoolbag with proper posture
Sources: Bubblynotes, http://www.bubblynotes.com/2017/01/beg-sekolah-dengan-rekabentuk-ergonomik.html

When viewed from the side, an adult spine has a natural S-shaped curve. The neck (cervical) and low back (lumbar) regions have a slight concave curve, and the thoracic and sacral regions have a gentle convex curve (Figure 2.1). The curves work

like a coiled spring to absorb shock, maintain balance, and allow range of motion throughout the spinal column (Mayfield Clinic, 2008).



(a) (b)

Figure 2.2 (a) The spine has 3 natural curves that form an S-shape and (b) the 5 regions of the spinal column

Sources: Mayfield Clinic, https://www.mayfieldclinic.com/PE-AnatSpine.htm

The lumbar spine, or low back, is a remarkably well-engineered structure of interconnecting bones, joints, nerves, ligaments, and muscles all working together to provide support, strength, and flexibility. However, this complex structure also leaves the low back susceptible to injury and pain. The lumbar spine typically has a slight inward curve known as lordosis. The lower back region contains large muscles that support the back and allow for movement in the trunk of the body. These muscles can spasm or become strained, which is a common cause of lower back

pain.The five vertebrae of the lumbar spine are connected in the back by facet joints, which allow for forward and backward extension, as well as twisting movements. The two lowest segments in the lumbar spine, L5-S1 and L4-L5, carry the most weight and have the most movement, making the area prone to injury (figure 2.2) (Spine Health, 2017). Uneven loading of the lumbar and cervical invertebrae disc which may not be correctly aligned due to a backpack load may also result in backpain (William, 2006).

2.4 School bag at risk factor on child health

2.4.1 Overview

Carrying a heavy school bag for long periods of time could result in repetitive stress injuries to the growing body. This follows the shifting of the child's centre of gravity in the direction of the load when carrying a back pack. Among school children today, the most popular means carrying books and supplies are by schoolbags (Azuan et al., 2010). In a recent study conducted by Mwaka et al.(2014) mentioned that about half of primary school children (49.8%) felt uncomfortable whenever they carried their bags and 119/305 (38.5%) did not like their bags because they were either oversized or heavy. Significant increases in weight and size of the school bags has been attributed to the pain in the school children (Johnson et al., 2011).

The research by Kabilmiharbi and Santhirasegaram (2017) showed that 77.1% of the students reported to suffer from musculoskeletal symptoms and the symptoms were most prevalent in the neck, shoulders, upper back and lower back. Furthermore, another recent study in Ireland also found that the prevalence of baseline musculoskeletal discomfort was as high as 63.4% on student of mean age 10.6, where school bag related discomfort was reported more frequently on the shoulders (27.3%) than on the back (15%).

2.4.2 Backpain

Many factors can contribute to low back pain and one of these would be load carrying. One of the important findings in this study was that as high as 58.3% of the school children reported having low back pain associated with carrying heavy school bag. A high prevalence of low back pain associated with heavy load can be associated with the fact that most of the school children were carrying a schoolbag with a weight of 15% of their body weight, which is the upper recommendations limit by many health practitioners (Tamrin et al., 2005).

In a study carried out by Nor Azlin et al. (2010) revealed that the occurrence of back pain is high in all three types of school (66.7% to 87.4%). The occurrence is highest in national school , in which 104 of 119 students reported back pain (87.4%)

although the average school bag weight is lightest among the three schools. There is also strong association between the types of school and the occurrence of back pain.

2.5 Mitigation/ overcome

According to Mwaka et al. (2014), in order to help to significantly reduce the number of schoolbag related injuries, parents should check backpack weights and contents. Besides, choose the right size of backpack, empty out unnecessary items and make sure children carry less than 10%-15% of body weight. Nor Azlin et al.(2010) also focusing on parents role which they should regularly check that their children do not carry too heavy schoolbags. The content of their children schoolbag should also be checked on a regular basis, to ensure no unnecessary materials are carried to school. Avantika and Shalini (2013), recommended that awareness should be created among health care professionals, teachers, parents to restrict backpack load less than 10% of bodyweight by using school locker shelves. Students, staff, and families need to be educated about backpacks' contribution to back pain and taught appropriate interventions to reduce injury. The probable ergonomic problem might be due to class furniture, thus there should be improvements in the design of the classroom chairs and desks that are used by schoolchildren (Azuan et al.,2010). In addition, it is important that schoolchildren be taught the proper method of carrying the bag and proper bags should be used (Tamrin et al., 2005).

CHAPTER 3

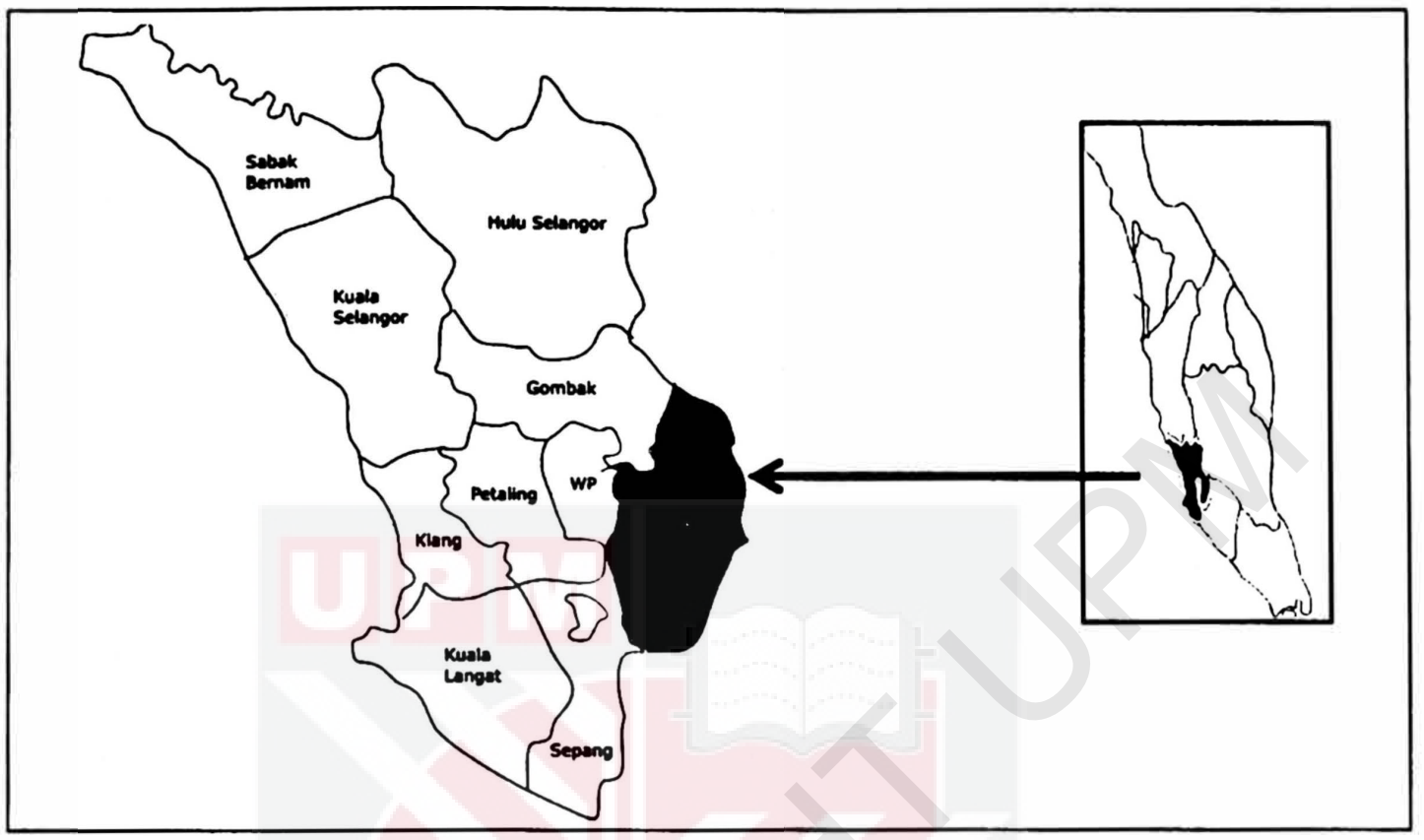
METHODOLOGY

This chapter justify the method and tools used in this research. The various sections will justify the design, duration, population and methods used for selection of research participants.

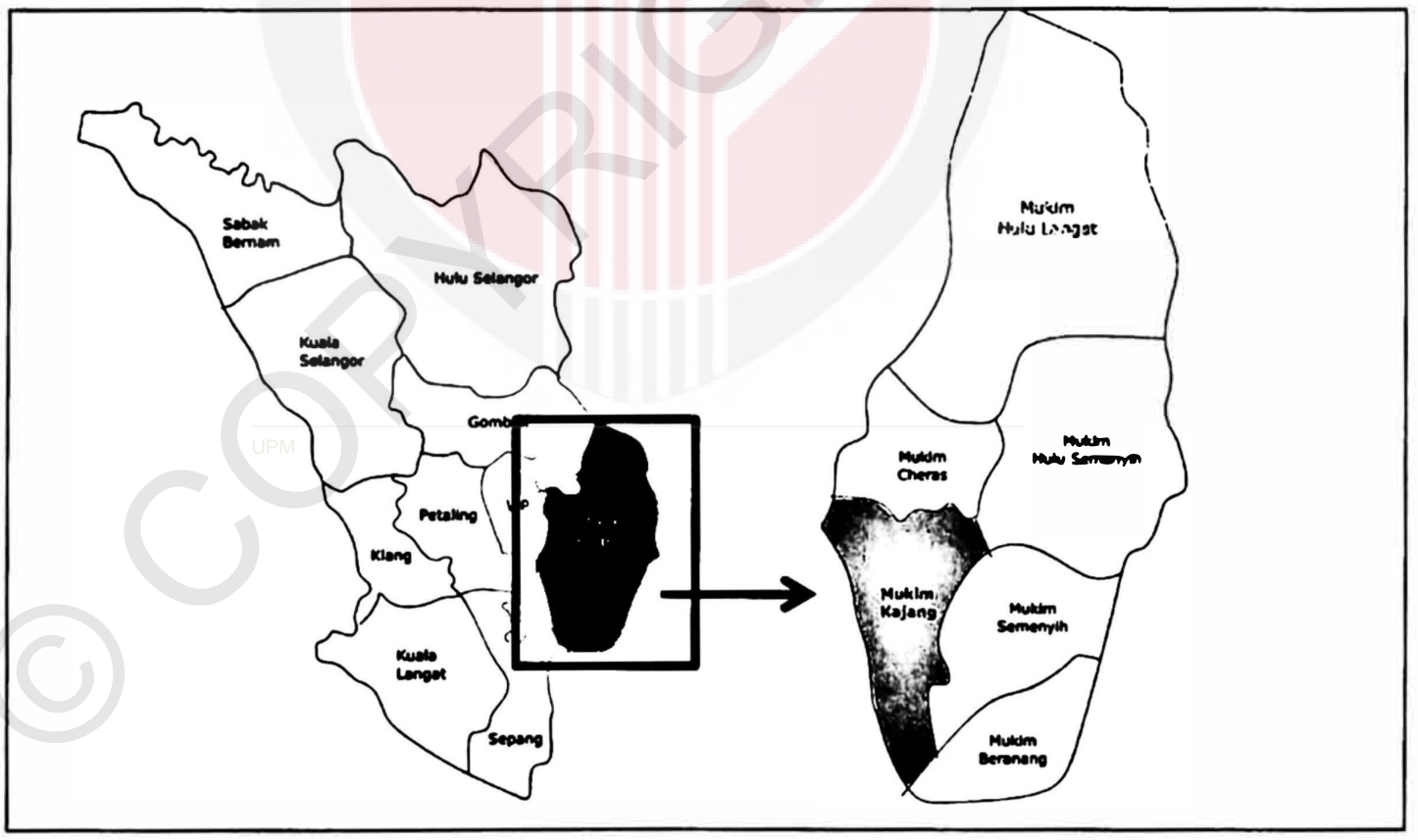
3.1 Study Location

This cross sectional study was conducted in Kajang, Selangor (Figure 3.1). Kajang is a mukim, a state constituency and the largest town of Hulu Langat District, Selangor, Malaysia. Kajang's main population centres are Taman Saujana Impian, Sg. Kantan, Sg. Jelok, Sg. Ramal, Sungai Chua, Sg. Sekamat, Bandar Mahkota, Jalan Reko, Jalan Bukit, Taman Prima Saujana, Taman Kantan Permai, Taman Kajang Perdana, Taman Sri Ramal, Taman Kajang Prima, Bandar Teknologi Kajang, Bandar Semenyih and Beranang.

In Kajang, there were 29 of government primary school and 6 of private international primary school. One of primary school known as school "A" was represented as the government primary school. Meanwhile, the primary school known as school "B" was represented as the private international primary school. Both of the primary schools selected were located at urban area.



(a)



(b)

Figure 3.1 Study Location (a) Hulu Langat District area, (b) Study Location at Kajang

3.2 Study Design

The researcher carried out a cross sectional study which was to study the association between school bag weight and back pain among primary school children. This study involves two groups of primary school children which were government primary school and private international primary school. Two types of primary schools were randomly selected in order to obtain a representative cross section of Kajang primary schools. The private international and government primary school children were chosen as both of them have different education system.

3.3 Sampling

3.3.1 Sampling Population

Inclusion criteria :

i. All students aged 8 and 11 years old.

ii. Students that physically healthy and had no major deformities.

Exclusion criteria :

i. Students that were failure to obtain consent from parents.

ii. Students who ever involved in surgery or treatment related to back pain due to accident or others.

3.3.2 Sampling Unit

Student who involved in this study were aged 8 and 11 years old respectively from both primary schools.

3.3.3 Sampling Frame

The updated school name list was obtained from the official website Selangor Education Department. Schools were sorted based on their category which were government primary school and private international primary school. Meanwhile, the students name list was obtained from the class teacher or the school administrative officer of the two schools in Kajang, Selangor.

3.3.4 Sample Size

$$n = \frac{z^2_{1-\alpha/2}\,[\,P_1(1-P_1) + P_2(1-P_2)\,]}{d^2}$$

where,

P_1 = estimated proportion (larger)

P_2 = estimated proportion (smaller)

d^2 = desired precision

According to study that have been conducted by Nor Azlin, Asfarina and Wan Chee (2010), the proportion of the learning materials weight are 1.45% and 1.61%.

$$n = \frac{1.96^2 [(0.01161)(0.98839) + (0.0145)(0.9855)]}{(0.05)^2}$$

$= 40$

$= 40 \times 20\% = 8$

$= 48 \times 2$

$= 96$ (included 20% non-response rate)

From the calculation above, there were 40 respondents needed for each group. However, 48 respondents were needed for each group in order to increase 20% of non-response rate. So that, the total of 96 respondents were estimated needed for this study since there were two groups of respondent involved.

3.3.5 Sampling Method

The two primary schools were randomly selected from a list of national and international primary school in Kajang. Then, the permission was obtained from Selangor Education Department (JPNS) and Ministry of Education (MOE).

For the selection of students, the stratified random sampling techniques was used (Azuan et al., 2010). All classes of years 8 and 11 were involved. The name list of students was obtained from school administrative officer or class teacher for the selection of students in each class. Those who fulfilled the inclusion criteria were selected randomly. Written consent from their parents or guardian was obtained before the data collection.

3.4 Study Instrumentation

3.4.1 Questionnaire

A set of modified questionnaire was used in this study. The questionnaire will be answered by the primary school children. The questionnaire consisted of five parts which were socio-demographic, information related to the schoolbag, physical activities and health problem related to schoolbag weight that included a diagram of body parts divided into neck, shoulder, upper back, lower back, elbow, arm, hand, thigh, knee and leg so as to assist the students in identifying the right body parts when answering the questions. Besides, there was also the Visual Analogue Scale (VAS) in this questionnaire to help students provide a more accurate responses to the intended questions and the usage of VAS with a questionnaire is very common in research conducted among school children as it would be much easier for kids to

understand since it is more graphical rather than words (Dockrell et al., 2015; James et al., 2014).

The questionnaire was modified from the previous study, Association of School Bag Weight with Lung Function, Back Pain and Perceived Load Among Primary School Children in Kajang, Selangor that have been conducted by Wong (2015).

3.4.2 Electronic weighing scale

An electronic body composition and scale (OMRON) was used to measure students' weight and KERN electronic weighing scale was used to measure the weight of their school bags. Both have the accuracy of ±0.1 kg.

3.4.3 Body meter Seca 208 cm

Body meter Seca 208cm was used to measure body heights. The measurement procedure was as recommended by Gordon (Tamrin et al., 2005). The body meter has an accuracy of ±0.1 cm. It was mounted on a flat wall with a flat surface and there was an attached head board, which was used for the measurements.

3.5 Data Collection Procedure

After all application process accepted, the selection of primary school childrens were made from theirs' name list obtained. The selected school childrens were gathered in a provided room. The briefing session about the research was conducted and they should fill in the form of agreement to participate in this study. The informed consent form were given to them to be given and filled by their parent or guardian. The form should be submitted to the researcher on the next day.

The school childrens who obtained consent from parents or guardian will be included in this study. Their weight and their school bag weight will be measured using KERN weighing scale and electronic body composition and scale (OMRON). Besides, the height of them will be measured using Bodymeter Seca 208cm. Body Mass Index (BMI) will be calculated using these measurements. The measurement of the schoolbag weight were taken for five days from Monday to Friday to get the average of them. Then, the questionnaire will be given to them to be filled in. To ensure understanding from the respondents, aids and explanation were given while the respondents answered the questionnaires.

3.6 Data Analysis

The data analysis was based on the study objective and used statistical package for social sciences (SPSS) version 22.0 as analysis tool.

Table 3.6: Data analysis based on the study objectives

No.	Objectives	Analysis choices	
		Parametric	Non parametric
1.	To determine demographic, background data, school bag weight and school bag information of the selected respondents.	Descriptive analysis	
2.	To compare the back pain among male and female primary school children.		Chi-square
3.	To determine the association between the type of school and back pain among primary school children.		Chi-square
4.	To determine the association between the type of school bag and back pain among primary school children.		Chi-square
5.	To determine the association between Body Mass Index (BMI) and back pain among primary school children.		Chi-square
6.	To determine the association between carriage method of schoolbag and back pain among the respondents.		Chi-square

7.	To determine the association between school bag weight and back pain among selected primary school children in Kajang, Selangor.	Chi-square

3.7 Quality Control

3.7.1 Questionnaire

Pre-test was carried out on ten subjects. The purpose of the pre-test was to ensure that the questionnaire formulated was understandable by the respondents. Besides that, the pre-test also checked on the suitability and adequacy of the questions forwarded in the questionnaire. From the results of the pre-test, the questionnaire was found to be suitable and understood by the desired respondents. If cronbach's alpha value is more than 0.75, the reliability and validity of the questionnaire is accepted. In this study, cronbach's alpha obtained was 0.796.

3.7.2 Standard operation procedure

Standard operation procedure (SOP) for the Seca 208 body meter, body composition and scale (OMRON) and KERN electronic weighing scale were followed precisely.

CHAPTER 4

RESULTS

4.1 Respondents' background

Background information of the school children in both type of schools were obtained through the questionnaire. The socio-demography background information is collected, e.g. age, gender, ethnicity and school type as shown in Table 4.1a, Figure 4.1a and Figure 4.1b below. Other data such as distribution of height, body weight and school bag information are shown in Table 4.1b.

Table 4.1a: Demographic and background data of respondents

Variable (N=81)	Age (years)		Total
	8 (N= 36)	11 (N= 45)	
Gender			
Male	21(58.3%)	21(46.7%)	42(51.9%)
Female	15(41.7%)	24(53.3%)	39(48.1%)
Ethnicity			
Malay	30(83.3%)	44(97.8%)	74(91.4%)
Chinese	1(2.8%)	1(2.2%)	1(1.2%)
Indian	5(13.9%)	0(0.0%)	6(7.4%)
School type			
Government	25(69.4%)	23(51.1%)	48(59.3%)
Private	11(30.6%)	22(48.9%)	33(40.7%)

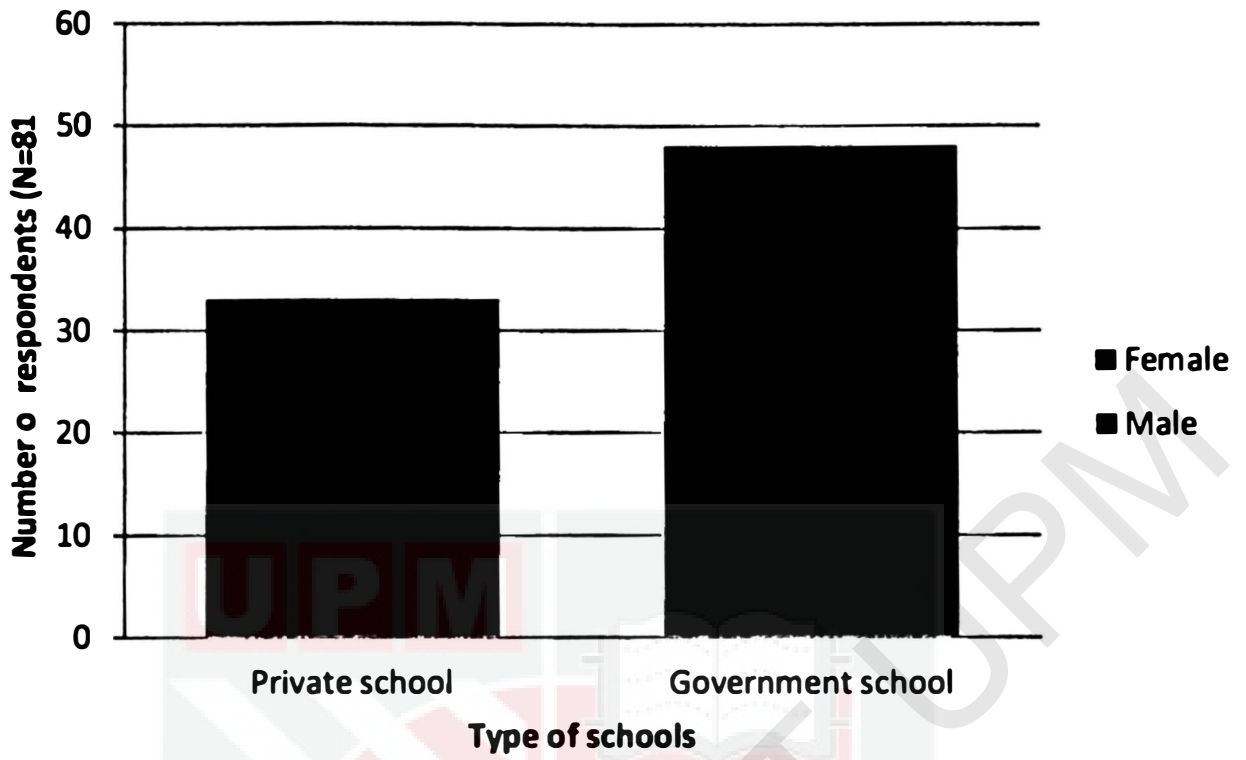


Figure 4.1a: The number of respondents based on gender in two types of schools

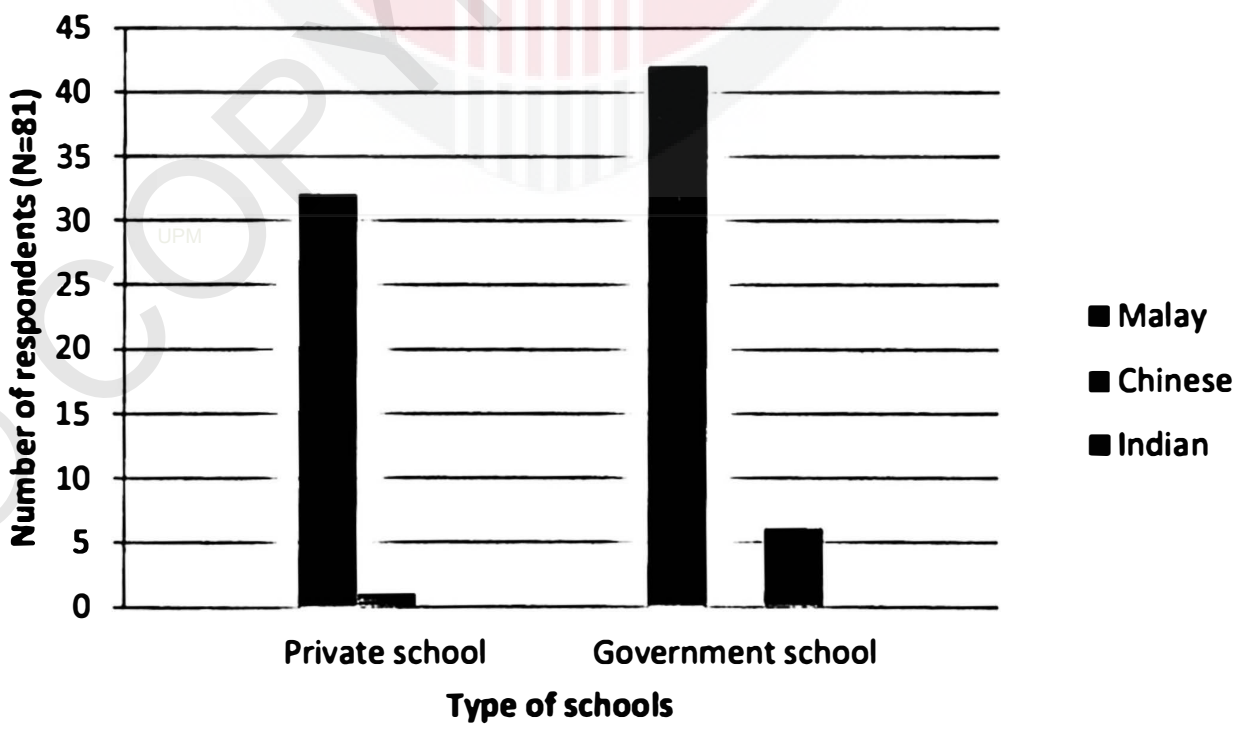


Figure 4.1b: The number of respondents based on races in two types of school

Table 4.1b: Distribution of height, body weight and school bag information

Variable (N=81)	School Type		Total
	Government (N=48)	Private (N=33)	
Height (cm)	132.6(21.6)	136.0(22.8)[a]	133.6(21.9)[a]
Weight (kg)	26.8(10.0)	30.2(20.2)[a]	27.4(16.2)[a]
Body Mass Index (BMI)			
Underweight	39(48.1%)	24(29.6%)	63(77.8%)
Normal	8(9.9%)	8(9.9%)	16(19.8%)
Overweight	1(1.2%)	1(1.2%)	2(2.5%)
Schoolbag weight (Kg)	4.74(2.6)[a]	2.54(1.64)[a]	
Relative weight (%)	18.62±4.87[b]	9.45±3.89[b]	
Bag type			
Single strap	0(0.0%)	1(1.2%)	1(1.2%)
Double strap	47(58.0%)	32(39.5%)	79(97.5%)
Bag with wheel	1(1.2%)	0(0.0%)	1(1.2%)
Method of carriage			
One shoulder	0(0.0%)	6(7.4%)	6(7.4%)
Both shoulders	47(58.0%)	27(33.3%)	74(91.3%)
Pull with wheel	1(1.2%)	0(0.0%)	1(1.2%)

[a] Median and interquatile range

[b] Mean and standard deviation

4.2 School bag weight and back pain

The main objective of this study was to determine the association between school bag weight and back pain among the respondents. The relative weight was used as it was the most common method in assessing the school bag weight. The relative weight of 10% and above represent as heavy school bag while below 10% as light school bag. Respondents that carried schoolbag more than 10% of their weight were 59.3% in government school and 14.8% in private school. Table 4.2a shown that schoolchildren in government school were carrying heavier schoolbag compared to private schoolchildren, (x^2=41.23, p=0.00). Meanwhile, based on Table 4.2b, there were 74.1% of total respondents carried heavy schoolbag and the relative weight was found to be significantly associated with back pain with p-value of 0.002.

Table 4.2a : Chi square analysis of relative weight and types of school (N = 81)

		Relative Weight (%)			
		<10	≥10	x^2	p
School type	Government	0(0.0%)	48(59.3%)	41.23	0.000
	Private	21(25.9%)	12(14.8%)		
Total		21(25.9%)	60(74.1%)		

Significant at p<0.05

Table 4.2b : Chi square analysis of relative weight and back pain (N = 81)

		Relative Weight (%)			
		<10	>10	x^2	P
Back pain	No	20(24.7%)	35(43.2%)	9.720	0.002
	Yes	1(1.2%)	25(30.9%)		
Total		21(25.9%)	60(74.1%)		

Significant at p<0.05

From the 26 respondents that experienced the back pain, 11 (13.6%) of them reported having the back pain that hurts little more. There were 3.7% respondents having back pain that hurts whole lot and hurts worst respectively (Figure 4.2)..

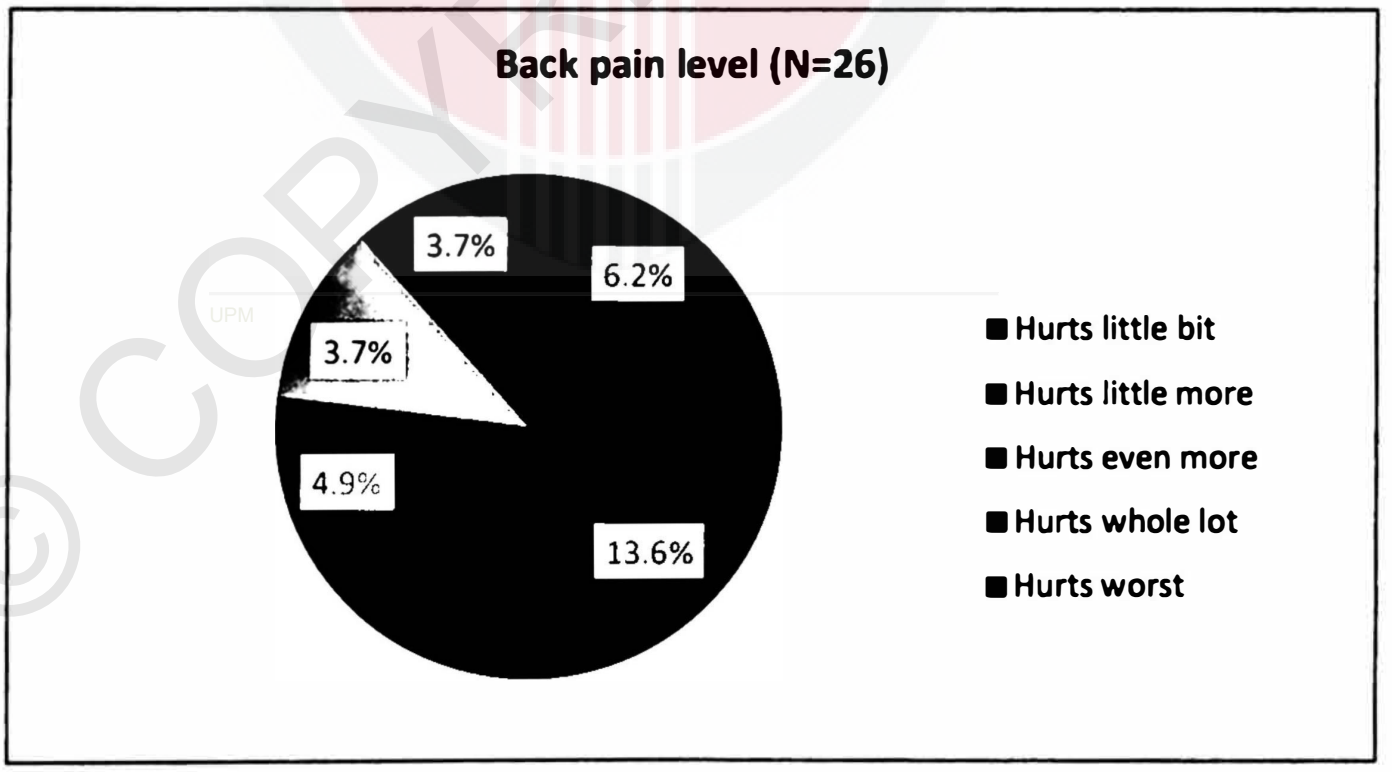


Figure 4.2 : The back pain level among the respondents

4.3 Back pain among respondents according to gender

The second specific objective of the study was to compare the back pain among male and female primary school children. These are summarized and shown in Table 4.3. Face to face interview by using questionnaire among respondents showed that 21.0% female and 11.1% male school children experienced back pain. This showed that female respondents experienced back pain more than male respondents.

Table 4.3: Back pain among male and female respondents

	Male (N=42)	Female (N=39)	Overall (N=81)	x^2	P
Back pain					
Yes	9 (11.1%)	17 (21.0%)	26 (32.1%)	4.557	0.033
No	33 (40.7%)	22 (27.2%)	55 (67.9%)		

Significant at $p<0.05$

4.4 Association between type of school, type of school bag, carriage method and BMI with back pain

Table 4.4 represents analysis to determine association between type of school, type of school bag, school bag carriage method and BMI with back pain. Bag type, method of carriage and BMI were found to not associate with back pain. Meanwhile, the type of school was found to be significantly associated with back pain with p-value of 0.026.

Table 4.4 : Chi square test of type of school, type of school bag, carriage method and BMI with back pain

Variable (N= 81)	Back pain		x^2	P
	No	Yes		
School type				
Government	28 (34.6%)	20 (24.7%)	4.949	0.026*
Private	27 (33.3%)	6 (7.4%)		
Bag type				
Single strap	1 (1.2%)	0 (0.0%)	2.596	0.273
Double strap	54 (66.7%)	25 (30.9%)		
Bag with wheel	1 (1.2%)	0 (0.0%)		
Method of carriage				
One shoulder	6 (7.4%)	0 (0.0%)	5.048	0.080
Both shoulders	49 (60.5%)	25 (30.9%)		
Pull with wheel	0 (0.0%)	1 (1.2%)		
Body Mass Index (BMI)				
Underweight	41 (50.6%)	22 (27.2%)	1.546	0.462
Normal	12 (14.8%)	4 (4.9%)		
Overweight	2 (2.5%)	0 (0.0%)		

Significant at $p<0.05$*

4.5 Suggestion / mitigation

Figure 4.5 showed that majority of the respondents chose to pack their schoolbag according to the class timetable so that they can reduce their schoolbag weight (81.5%). Second suggestion by the respondents was to leave their learning materials in the locker provided in school, (64.2%). There were 55.6% respondents voted for the electronic uses as the learning tools in school.

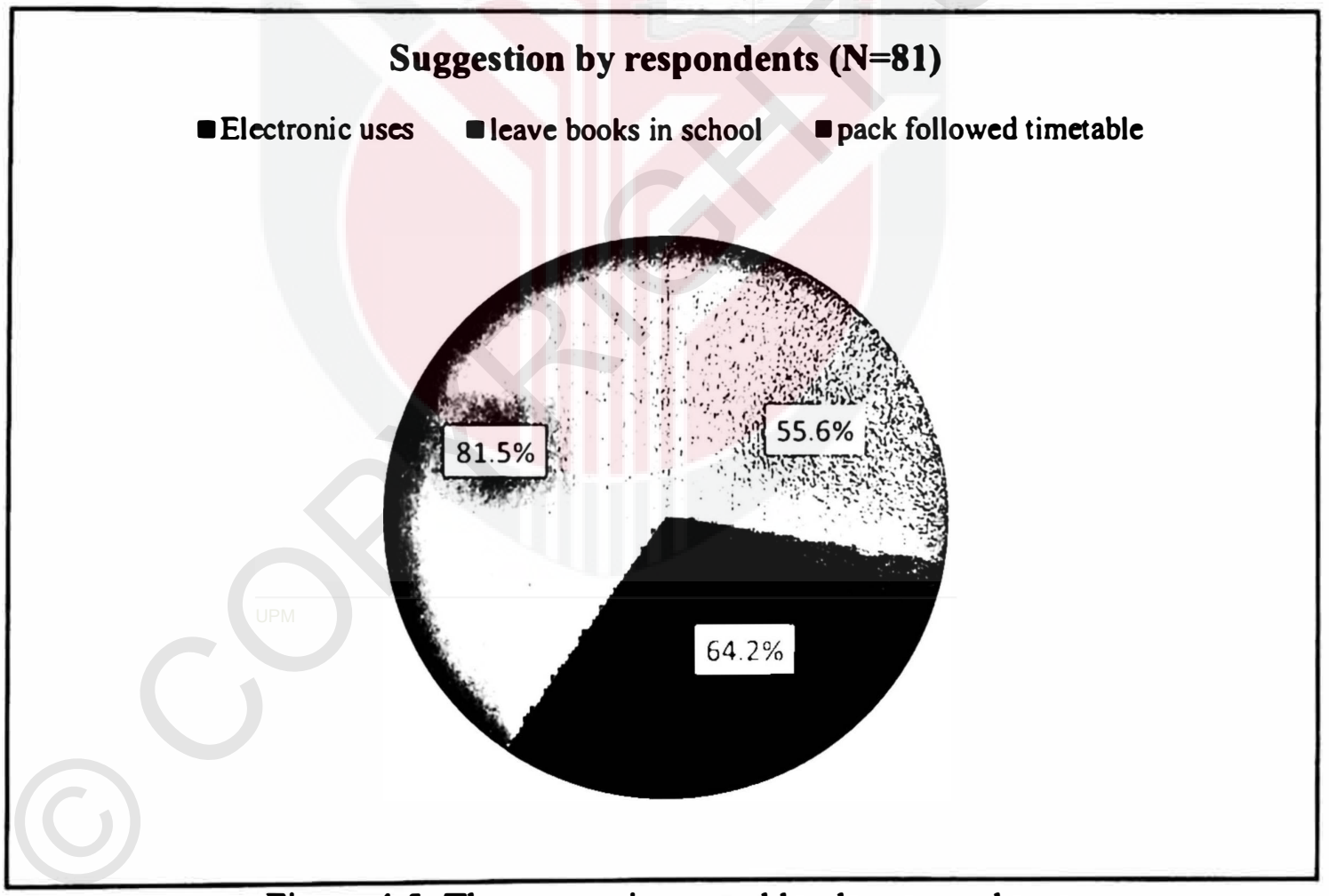


Figure 4.5: The suggestion voted by the respondents

CHAPTER 5

DISCUSSION, CONCLUSION, RECOMMENDATION

5.1 Discussion

This cross sectional study was conducted among primary schoolchildren in Kajang, Selangor. This study involved two type of schools which were government and private primary school. There was less study performed locally studying the effects of school bag weight and its link with back pain in different school system or types. For example, there was a previous study have been done in Malaysia by Nor Azlin et al. (2010), involved only the government schools but different medium primary schools which were National School, Chinese Medium School and Tamil Medium School. Other studies in Malaysia (Tamrin et al., 2005) and (Azuan et al., 2010) were also conducted in government primary schools. So that, this study tried to determine the association of school bag weight and back pain in two different type of primary schools.

5.1.1 Personal information of respondents

Based on the demographic and background data of the respondents, majority of them were 11 years old, comprised of 55.6% (45 out of 81 respondents) and the rest were 8 years old. 51.9% or 42 of the respondents were male and 48.1% or 39 were female. Malay race was the highest amongst the ethnicity group. The respondents from the government primary school was 59.3% (48 of respondents) while private school was 40.7% (33 of respondents).

5.1.2 Schoolbag weight and back pain among respondents

The respondents who carrying schoolbag weight more than 10% of their body weight were 60(74.1%) and 30.6% of them were having back pain. Meanwhile, 1.2% that experienced back pain was carrying schoolbag not more than 10%. There was an association between schoolbag weight and back pain, (x^2=9.720, p=0.002). This was similar with previous study by Azuan et al. (2010), who showed schoolbag weight was significantly associated with lower back pain (p=0.048). Besides, the one of the important findings in the study conducted by Tamrin et al. (2005), was that as high as 58.3% of the schoolchildren reported having low back pain associated with carrying heavy schoolbags.

5.1.3 Types of school and back pain among respondents

The schoolbag was heavier among the schoolchildren from government school (18.62kg) which were more than 10% of their body weight. This somewhat reflects higher use of learning materials in the government school compared to private school. The weight of textbooks supplied by the Ministry of Education (MOE) ranges between 1.19kg and 2.36kg and if schoolchildren abide to the daily timetable and avoid carrying materials that are not necessary, the weight carried by them can be substantially reduced. The educational systems were difference between government and private school. As the private school was a Tahfiz School Academic, the system used was totally difference. Private schools' schoolchildren will spend their time more for "hafazan" and only having one subject for educational class daily. They need to bring only one textbook for every day. That was one of the reasons schoolchildren from private school carried lighter schoolbag. Moreover, there were the lockers prepared for them so that they can keep their things in there. The existing of back pain was 26(32.1%) out of which 20(24.7%) were from government and 6(7.4%) from private school. The occurrence of back pain was higher in government school as the schoolchildren from there were carried heavier schoolbag. The types of school were found significantly associated with back pain, x^2= 4.949 and p=0.026. In previous study conducted by Nor Azlin et al. (2010), revealed that there was the strong association between types of school and the

occurrence of back pain. The schools that involved in that study were National school, Tamil medium school and Chinese medium school.

5.1.4 Types of schoolbag, method of carriage, BMI and back pain among the respondents

There were no significant association between back pain and types of schoolbag, method of carriage and BMI. This was supported by Wong, (2015). However, these results were different from study done by Amyra Natasha A, et al. (2017), which showed that carrying a one-shouldered bag caused more low back pain than wearing a two shouldered bag. The study also demonstrated that subjects with a higher BMI had a higher degree of low back pain. This was probably due to the extra loading exerted on the musculoskeletal system in individuals with a large body size. The study done by Paananen et al. (2010) reported that overweight and/or obese students had a higher prevalence of back pain than students with normal BMI.

5.1.5 Gender and back pain among respondents

Females experienced back pain more than male in this study. This could be due to gender differences as the physiological and physical characteristics between gender were different (Azuan et al., 2010). The findings by Tamrin et al. (2005), showed that females children were less efficient in carrying loads on their backs, females were supposed to utilise bigger erector spinae muscles compared to males, which can lead to faster rate of muscle fatigue and increase the risk of low back pain. Fonseca et al. (2016) and Papadopolou et al. (2013), revealed that back pain was significantly higher in girls than in boys.

5.1.6 Back pain level among the respondents

There were 11 or 13.6% respondents said that back pain was hurts little more. 3.7% of them experienced back pain that hurts the worst. There were also other parts of body that may affect due to heavy schoolbag. 14 or 17.3% of respondents reported having pain at the shoulders. In the study conducted by Avantika and Shalini (2013), 27% of children reported having neck pain and it was significantly associated with school furniture features, emotional and conducts problem, family history of low back pain and previous treatment for musculoskeletal disorders. In a study conducted by Chiang et al. (2006), the most commonly reported types of musculoskeletal pain

associated with backpacks were lower back pain, shoulder pain, upper back pain and neck pain.

5.2 Limitation and strengths

This study had a few limitations. The total of respondents required in this study were 96 from both private (48 respondents) and government (48 respondents) primary schools. However, only 81 respondents were involved in this study. There were 48 respondents from government school and 33 respondents from private school. This was because the total of Year 2 and Year 5 schoolchildren in private school were 33.

The existing of back pain was detected by asking the respondents "yes" or "no" to previous experience of pain in the back region. There was no privacy during the completion of questionnaires. Thus, there was a possibility that answers given by the respondents in this study resulted from influences by the others. A clinical assessment to confirm the occurrence of back pain would minimize this bias (Nor Azlin et al., 2010).

However, this study had its own strength. The schoolbag weights of the respondents were measured for five days to get the average of the schoolbag weight during the school days. The variability of schoolbag weights due to differences in the

timetable across a week should be considered to better estimate the actual weight of the schoolbag (Nor Azlin et al., 2010). Hence, the best way to get the accurate average of schoolbag weights was by measuring them throughout a week.

5.3 Conclusion

In conclusion, this study shows that most of the schoolchildren are carrying heavy schoolbag and they are exceeding 10% of their body weight. The existing of back pain is higher among the respondents who are carrying heavy schoolbag. Schoolchildren from government school carry heavier schoolbag and almost half of them experienced back pain. The existing of back pain is significantly associated with schoolbag weight and types of school. It is hoped that the results from this study will help in suggesting and supporting improvements to be taken regarding this schoolbag weight issues.

5.4 Recommendations

Preventive measures are required in order to reduce the health problem related to schoolbag weight. MOE should limit the numbers of notebooks for each subject. Besides, the uses of electronic devices as the learning tools can be implemented in order to reduce the schoolbag weight of the schoolchildren. Another possible way to minimize the problem is by preparing the lockers to the schoolchildren within the school compound. Schoolchildren may keep their learning materials and other things in that locker rather than carry them on a daily basis. Parents should monitor their children and packing their schoolbag according to the class timetable. This action is to ensure no unnecessary materials are carried by them to school (Nor Azlin et al., 2010). Besides, to decrease injury and improve comfort, experts have recommended that children should use backpacks that match the size of the child (Mwaka et al., 2014).

For future research, the amount of respondents for this study can be increased where this will improve the findings. The larger the number of respondents for the study, means more accurate data can be obtained and a clearer pattern of data can be acquired.

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APPENDICES

JAWATANKUASA ETIKA UNIVERSITI UNTUK PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
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SELANGOR, MALAYSIA

BORANG 2.5: PENERANGAN DAN PERSETUJUAN PENYERTAAN (IBUBAPA/PENJAGA)

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1.TAJUK KAJIAN

Hubungkait Antara Berat Beg Sekolah Dan Sakit Belakang dalam Kalangan Kanak-kanak Sekolah Rendah di Kajang, Selangor.

2. PENGENALAN

Satu kajian telah menunjukkan bahawa masalah sakit belakang dalam kalangan kanak-kanak dan remaja bervariasi antara 11% dan 52.1%. Penggunaan beg sekolah adalah faktor yang paling penting yang menyebabkan sakit belakang di kalangan pelajar. Berat beg sekolah yang berlebihan boleh mengakibatkan masalah ini berlaku. Namun begitu, cara penggunaan beg sekolah juga merupakan salah satu faktor yang menyumbang terhadap masalah sakit belakang dalam kalangan pelajar.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Penjaga/ Ibubapa perlu mendatangani borang persetujuan bagi pihak kanak-kanak untuk terlibat dalam kajian ini. Hanya kanak-kanak yang telah dipersetujui oleh penjaga/ibubapa sahaja akan diambil sebagai responden dalam kajian ini. Responden dikehendaki untuk melengkapkan setiap ujian di bawah mengikut arahan penyelidik:

i. Borang soal-selidik
ii. Pengambilan berat badan dan tinggi
iii. Pengambilan berat beg sekolah

4. SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

Kanak-kanak yang mempunyai ciri-ciri berikut tidak digalakkan untuk mengikuti kajian:

i. Pelajar yang gagal mendapat kebenaran daripada ibu bapa.
ii. Pelajar yang mengalami masalah ortopedik yang teruk atau yang sakit semasa kajian.

5. APAKAH FAEDAH MENYERTAI KAJIAN INI?

a)KEPADA ANDA SEBAGAI PESERTA?

Pada akhir kajian ini, ibubapa/penjaga akan dimaklumkan mengenai keputusan maklumat kesihatan mereka, di mana ini dapat membantu mereka untuk mengambil tindakan awal dalam

mengatasi masalah sakit belakang dalam kalangan anak-anak mereka.

b) KEPADA PENYELIDIK?

Pada akhir kajian ini, responden akan dimaklumkan mengenai keputusan maklumat kesihatan mereka yang berkaitan dengan masalah sakit belakang dan perkaitannya dengan berat beg sekolah yang dibawa oleh responden serta memberikan cadangan bagi mengatasi masalah tersebut.

6. ADAKAH IA BERISIKO?

Kajian ini tidak mempunyai sebarang risiko terhadap responden.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Semua maklumat yang diperolehi dari kajian ini akan dirahsiakan. Maklumat hanya akan didedahkan dalam mana-mana laporan atau penerbitan secara kolektif. Walaubagaimanapun, keputusan akan dihantar dan dilaporkan kepada anda sekiranya terdapat permintaan.

8. SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?

Sekiranya anda mempunyai sebarang pertanyaan semasa penyelidikan, sila hubungi kami untuk maklumat lanjut:

Shurul Azwa Shuhaimi (Pelajar Sarjana Muda)	**Prof. Madya Haliza Abdul Rahman (Penyelia Projek)**
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Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

9. PERSETUJUAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini secara sukarela bersetuju membenarkan *anak / jagaan saya.....menyertai penyelidikan klinikal *(pengajian klinikal/ pengajian soal selidik) seperti yang disebut di atas.

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa *anak / jagaan saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan. Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti *anak/ jagaan saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan *anak/ jagaan saya.

Saya *setuju/ tidak bersetuju untuk imej/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

*potong yang tidak berkenaan

Tandatangan .....
(*IbuBapa/Penjaga*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada IbuBapa/ Penjaga ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

Kod responden: _____

JABATAN KESIHATAN PERSEKITARAN DAN PEKERJAAN

FAKULTI PERUBATAN DAN SAINS KESIHATAN

UNIVERSITI PUTRA MALAYSIA

HUBUNGKAIT ANTARA BERAT BEG SEKOLAH DAN SAKIT BELAKANG DALAM KALANGAN KANAK-KANAK SEKOLAH RENDAH DI KAJANG, SELANGOR

ARAHAN SOALAN:

1. Borang soal selidik ini mengandungi **empat** (4) bahagian iaitu:

   Bahagian A : Maklumat sosio-demografi

   Bahagian B : Maklumat berkenaan beg sekolah

   Bahagian C : Aktiviti harian

   Bahagian D : Berat beg sekolah dan masalah kesihatan

   Bahagian E : Cadangan mengatasi masalah sakit belakang

2. Anda diminta menjawab semua soalan yang terdapat dalam buku soalan ini.

3. Buku soalan ini hendaklah diserahkan kepada pengkaji setelah selesai menjawab.

Arahan:

Sila tandakan 'V' dalam persegi ☐ butiran maklumat yang sesuai atau isikan maklumat yang sesuai pada garisan _____ yang disediakan bagi setiap soalan.

Bahagian A : Maklumat sosio-demografi

1. **Nama :** _____

2. **Umur :**

   ☐ 8 tahun
   ☐ 9 tahun
   ☐ 10 tahun
   ☐ 11 tahun

3. **Jantina :**

   ☐ Perempuan
   ☐ Lelaki

4. **Keturunan/ bangsa:**

   ☐ Melayu
   ☐ Cina
   ☐ India
   ☐ Lain-lain
   (sila nyatakan _____)

5. **Berat :** _____ (diisi oleh penyelidik)

6. **Tinggi :** _____ (diisi oleh penyelidik)

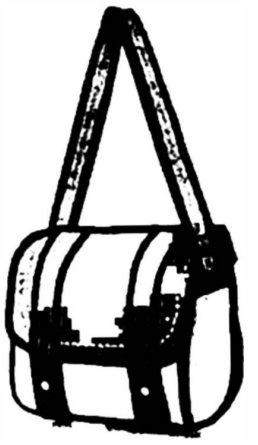
Bahagian B: Maklumat berkenaan beg sekolah

7. **Berat beg sekolah : (diisi oleh penyelidik)**

Hari	Berat beg sekolah (g)
Isnin	
Selasa	
Rabu	
Khamis	
Jumaat	

8. Apakah jenis beg sekolah anda?

☐ 

☐ 

☐ 

9. Bagaimana anda membawa beg sekolah anda?

				
Di kedua-dua belah bahu	Di salah satu bahu	Bawa guna tangan	Tarik guna roda	Tidak membawa atau memakai beg
☐	☐	☐	☐	☐

10. Berapa lama kah anda memikul beg sekolah pada setiap hari? (tanpa bantuan ibu bapa atau orang lain)

☐ Kurang 5 minit
☐ 5 – 10 minit
☐ 10 – 15 minit
☐ 15 – 30 minit
☐ Lebih 30 minit

11. Adakah anda mengemas beg sekolah anda mengikut jadual kelas?

☐ Tidak
☐ Ya

Bahagian C: Aktiviti harian

12. Berapa jam sehari anda gunakan untuk belajar?

- ☐ Kurang 2 jam
- ☐ 2 jam - 3 jam
- ☐ 4 jam - 5 jam
- ☐ Lebih 5 jam

13. Berapa jam sehari anda gunakan untuk menonton televisyen?

- ☐ Kurang 2 jam
- ☐ 2 jam - 3 jam
- ☐ 4 jam - 5 jam
- ☐ Lebih 5 jam

14. Berapa jam sehari anda gunakan untuk bermain komputer?

- ☐ Kurang 2 jam
- ☐ 2 jam - 3 jam
- ☐ 4 jam - 5 jam
- ☐ Lebih 5 jam

15. Berapa jam sehari anda gunakan untuk bersama-sama rakan apabila di luar waktu sekolah? (belajar, menonton televisyen, bermain permainan video, dll)

- ☐ Kurang 2 jam
- ☐ 2 jam - 3 jam
- ☐ 4 jam - 5 jam
- ☐ Lebih 5 jam

Bahagian D: Berat beg sekolah dan masalah kesihatan

16. Kebiasaanya, berapa banyak kekuatan dan tenaga yang anda perlukan untuk membawa beg sekolah anda?

- ☐ Amat sedikit
- ☐ Sedikit
- ☐ Sederhana
- ☐ Agak banyak
- ☐ Sangat banyak

17. Berapa kerap anda merasakan beg sekolah anda terlalu berat untuk diangkat?

- ☐ Tidak pernah
- ☐ Jarang-jarang
- ☐ Seringkali
- ☐ Hampir selalu
- ☐ Selalu

18. Adakah beg sekolah yang berat menjadi masalah untuk anda?

- ☐ Tidak pernah
- ☐ Jarang-jarang
- ☐ Seringkali
- ☐ Hampir selalu
- ☐ Selalu

19. Pada pendapat anda, adakah berat beg sekolah anda memenatkan?

- ☐ Tidak pernah
- ☐ Jarang-jarang
- ☐ Seringkali
- ☐ Hampir selalu
- ☐ Selalu

20. Adakah anda berasa penat selepas memikul beg sekolah anda?

- ☐ Tidak pernah
- ☐ Jarang-jarang
- ☐ Seringkali
- ☐ Hampir selalu
- ☐ Selalu

21. Adakah bahagian belakang anda sakit sekarang?

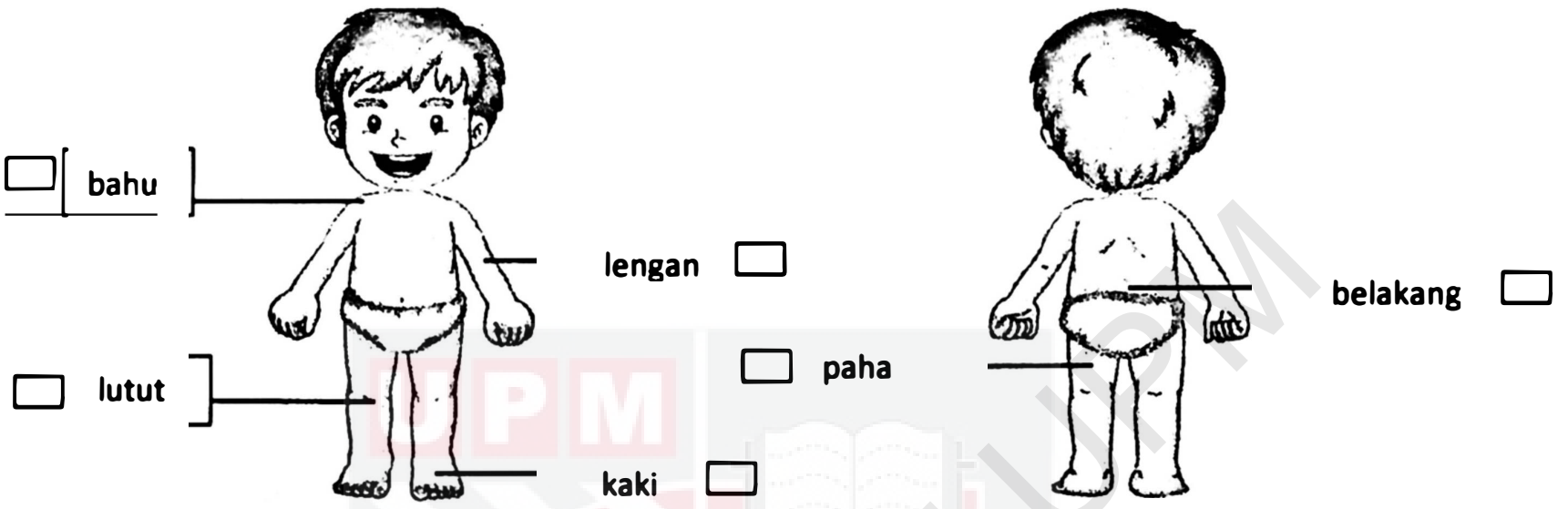
- ☐ Tidak
- ☐ Ya

22. Adakah anda mempunyai sakit belakang dari 15 hari yang lalu?

- ☐ Tidak
- ☐ Ya

Arahan: Jika anda jawab "Ya", sila jawab soalan 23-27. Jika anda menjawab "Tidak", anda tidak perlu menjawab soalan seterusnya.

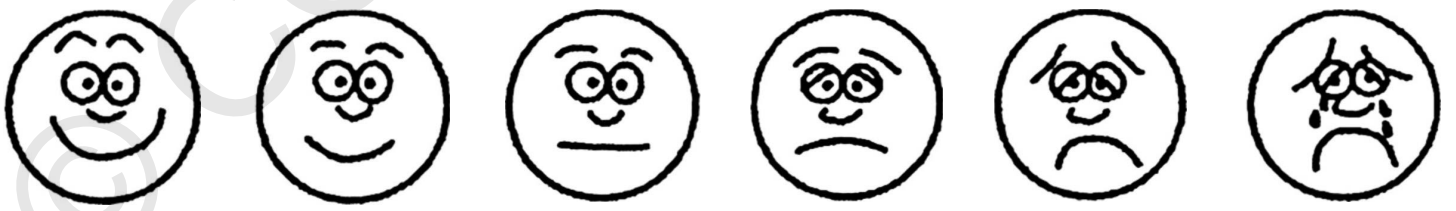
23. Apabila anda mempunyai sakit belakang, bahagian-bahagian badan yang manakah akan turut sakit atau terpengaruh? (Boleh pilih lebih daripada satu)



24. Apabila anda mempunyai sakit belakang, berapa lamakah ia akan sakit?

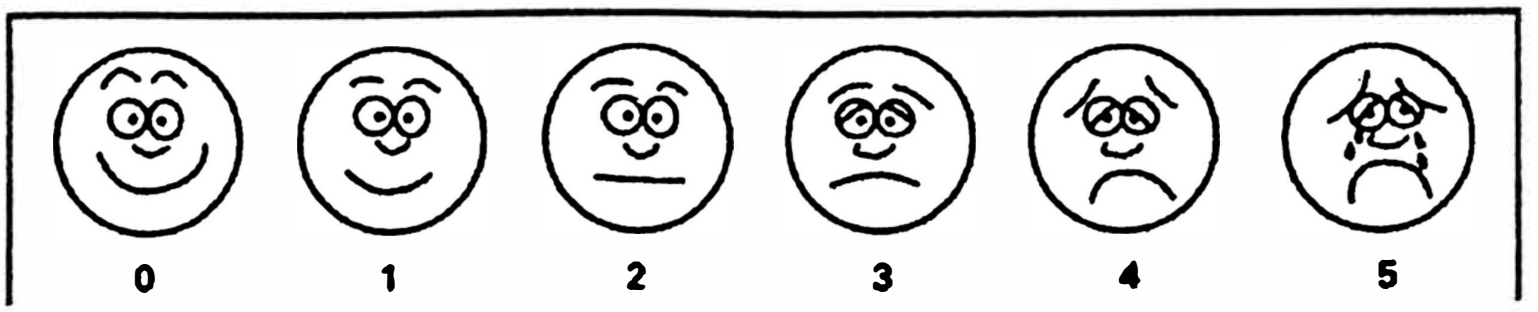
- ☐ 1jam- 1hari
- ☐ 1hari- 1minggu
- ☐ 1minggu- 1bulan
- ☐ 1bulan- 6bulan
- ☐ Lebih daripada 6 bulan

25. Visual Analog di bawah mewakili jarak antara kekurangan rasa sakit (0) dan rasa sakit yang tertinggi anda boleh bayangkan (5). Tandakan di mana sakit belakang yang paling kerap anda alami.



0	1	2	3	4	5
☐ Tidak menyakitkan	☐ sedikit menyakitkan	☐ menyakitkan	☐ lebih menyakitkan	☐ amat menyakitkan	☐ sangat menyakitkan

26. Visual Analog di bawah mewakili jarak antara kekurangan rasa sakit (0) dan rasa sakit yang tertinggi anda boleh bayangkan (5). Tandakan di mana sakit belakang yang paling teruk anda alami.



☐	☐	☐	☐	☐	☐
Tidak menyakitkan	sedikit menyakitkan	menyakitkan	lebih menyakitkan	amat menyakitkan	sangat menyakitkan

27. Adakah anda perasan sakit belakang anda disebabkan oleh keadaan-keadaan ini? (Boleh pilih lebih daripada satu)

- ☐ Kemalangan
- ☐ Gerakan tiba-tiba
- ☐ Kekuatan dan tenaga
- ☐ Sukan
- ☐ Duduk lama
- ☐ Angkat barang yang berat
- ☐ Berjalan
- ☐ Angkat beg sekolah

Bahagian E : Cadangan mengatasi masalah sakit belakang

		Setuju	Tidak setuju
28	Menggunakan alat elektronik seperti tablet sebagai alat pembelajaran.		
29	Buku teks ditinggalkan di tempat yang dikhaskan di sekolah.		
30	Mengemas beg sekolah mengikut jadual waktu kelas.		

SEKIAN, TERIMA KASIH